N3172B.AR.000036
VIEQUES WEST
5090.3a

Final

Feasibility Study Report Solid Waste Management Unit (SWMU) 6

Former Naval Ammunition Support Detachment Vieques, Puerto Rico

January 2013

Contract No. N62470-11-D-8012 | CTO-013

prepared by CH2MHILL

Final

Feasibility Study Report
Solid Waste Management Unit (SWMU) 6

Former Naval Ammunition Support Detachment
Vieques, Puerto Rico

Contract Task Order 013

January 2013

Prepared for

Department of the Navy
Naval Facilities Engineering Command (NAVFAC) Atlantic

Under the

NAVFAC CLEAN 8012 Program
Contract N62470-11-D-8012

Prepared by

Virginia Beach, Virginia

Executive Summary

This Feasibility Study (FS) report presents an evaluation of potential remedial alternatives for Solid Waste Management Unit (SWMU) 6, the Former Mangrove Disposal Site, located on the Former Naval Ammunition Support Detachment (NASD), Vieques, Puerto Rico (**Figure ES-1)**.

The site was used for the disposal of general solid waste during the 1960s and 1970s from United States Department of the Navy (Navy) operations within the former NASD. Waste discarded at the site included empty containers of lubricants, oil, solvents, and paints; broken glass; and rubble. No munitions and explosives of concern (MEC) were identified at the site; however, munitions-related items such as inert concrete-filled practice bombs, empty bomb dispensers, and empty shell casings were identified. This material, as well as the general solid waste described above, was removed during an interim removal action in 2009.

The property that contains SWMU 6 was transferred from the Navy to the Department of the Interior (DOI) in 2001 and is part of the Vieques National Wildlife Refuge (CH2M HILL, 2007). On March 14, 2005, Vieques was placed on the National Priorities List (NPL), which required subsequent environmental restoration activities for Navy Installation Restoration (IR) sites on Vieques to be conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) unless and until removed from CERCLA authority. In this endeavor, the Navy, United States Environmental Protection Agency (USEPA) Region 2, Commonwealth of Puerto Rico Environmental Quality Board (PREQB), and United States Fish and Wildlife Service (USFWS) work jointly as the Vieques Environmental Restoration Program (ERP) Team.

The site was originally an estuarine, intertidal, forested wetland dominated by black mangrove, but the 2009 interim removal action altered the site to a shallow marine lagoon environment, approximately 0.6 acre and 5 inches to 3 feet deep (Shaw, 2010; CH2M HILL, 2010a). **Figure ES-2** is an aerial photograph of SWMU 6 that shows the dense vegetation in the mangrove area prior to the interim removal action in 2009.

Figure ES-3 presents a conceptual site model (CSM) for SWMU 6. Although the CSM identifies multiple potential and hypothetical human and ecological receptors, the only human receptors of potential concern at the site are potential consumers of edible-size fish and blue crab from the lagoon, as discussed below. The post-removal human health risk assessment (HHRA) contained in this FS Report identified polychlorinated biphenyls (PCBs) as the only human health chemicals of concern (COCs), based on human consumption of edible-size fish/blue crab. The PCB concentrations posing unacceptable risk for human consumption are likely attributable to PCB uptake from sediment at SWMU 6 and subsequent bioaccumulation in the fish and crab.

The post-removal ecological risk assessment (ERA) contained in this FS Report identified cadmium, copper, lead, and zinc as the only ecological COCs, based on direct exposure to these metals in sediment by lower trophic level receptors.

Based on the results of the HHRA and ERA, evaluation of potential remedial alternatives for SWMU 6 sediment (i.e., the source of COCs identified for human health and biota) is warranted. No unacceptable risks were identified for potential/hypothetical human or ecological receptors exposed to soil, groundwater, or surface water, the latter representing the surface expression of groundwater at SWMU 6. Therefore, no remedial action is necessary for these media.

Based on the above information, the remedial action objectives (RAOs) for SWMU 6 are as follows:

- Prevent human exposure to PCBs in edible-size fish and blue crab at concentrations that may pose unacceptable risk
- Encourage development of a benthic community that reflects the physical environment represented by the SWMU 6 habitat relative to surrounding marine habitats

NOTE: THIS SUMMARY IS PRESENTED IN ENGLISH AND SPANISH FOR THE CONVENIENCE OF THE READER. EVERY EFFORT HAS BEEN MADE FOR THE TRANSLATIONS TO BE AS ACCURATE AS REASONABLY POSSIBLE. HOWEVER, READERS SHOULD BE AWARE THAT THE ENGLISH VERSION OF THE TEXT IS THE OFFICIAL VERSION.
NOTA: ESTE RESUMEN SE PRESENTA EN INGLÉS Y EN ESPAÑOL PARA LA CONVENIENCIA DEL LECTOR. SE HAN HECHO TODOS LOS ESFUERZOS PARA QUE LA TRADUCCIÓN SEA PRECISA EN LO MÁS RAZONABLEMENTE POSIBLE. SIN EMBARGO, LOS LECTORES DEBEN ESTAR AL TANTO QUE EL TEXTO EN INGLÉS ES LA VERSIÓN OFICIAL.

As shown on Figures ES-4 through ES-9, six remedial alternatives were developed for evaluation against seven feasibility evaluation criteria, as defined in the National Contingency Plan (NCP):

- Alternative 1—*No Action*
- Alternative 2— *Monitored Natural Recovery and Land Use Controls*
- Alternative 3— *Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment*
- Alternative 4— *In-situ Sand Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls*
- Alternative 5— *In-situ Reactive Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls*
- Alternative 6—*Intertidal Forested Wetland Restoration and Land Use Controls*

A comparative analysis was conducted for each alternative relative to one another in relation to NCP evaluation criteria, as shown in **Table ES-1**. The purpose of this analysis is to demonstrate the relative advantages and disadvantages of each remedial alternative so that key tradeoffs can be assessed during the decision–making process.

This FS Report will support the selection of a preferred remedy. Prior to the selection of the remedy, the Proposed Remedial Action Plan (PRAP), which documents the Navy's and USEPA's preferred remedy, will be prepared and provided for public comment. Following consideration of substantive public comments, the selected remedy will be documented in the Record of Decision (ROD) for SWMU 6.

Resumen Ejecutivo

Este reporte del Estudio de Factibilidad (FS por sus siglas en inglés) presenta una evaluación de las alternativas de remedición potenciales para la Unidad de Manejo de Desperdicios Sólidos (SWMU por sus siglas en inglés) 6, el Antiguo Sitio de Disposición en el Manglar, localizado en el Antiguo Destacamento de Apoyo a Municiones Navales (NASD por sus siglas en inglés), Vieques, Puerto Rico (**Figura ES-1)**.

El sitio fue usado para disponer durante los años 1960 y 1970 topo tipo de desperdicios sólidos generado por las operaciones del Departamento de la Marina de los Estados Unidos (Marina) en el antiguo NASD. Los desperdicios que fueron dispuestos en el sitio incluyen contenedores vacios de lubricantes, aceites, solventes, y pintura; vidrio roto; y escombros. No se identificaron municiones y explosivos de preocupación (MEC por sus siglas en inglés) en el sitio; sin embargo si se identificaron artículos relacionados a municiones, como bombas de práctica inertes rellenas de concreto, contenedores de bombas vacías, y casquillos de artillería vacías. Este material, al igual que los desperdicios descritos arriba, fueron removidos durante la acción de remoción interina en 2009.

La propiedad que incluye SWMU 6 fue transferida de la Marina al Departamento del Interior (DOI por sus siglas en inglés) en 2011, y forma parte el Refugio Nacional de Vida Silvestre de Vieques (CH2M HILL, 2007). El 14 de marzo de 2005, Vieques fue añadida a la Lista de Prioridades Nacionales (NPL por sus siglas en inglés), lo que requirió que las actividades de restauración ambiental subsecuentes para los sitios en Vieques bajo el programa de Restauración de la Instalación (IR pos sus siglas en inglés) de la Marina, se lleven a cabo bajo la autoridad de la Ley de Respuesta Compensación y Responsabilidad Ambiental (CERCLA por sus siglas en inglés). En este esfuerzo, la Marina, la Agencia de Protección Ambiental de los Estados Unidos (USEPA por sus siglas en inglés) Región 2, la Junta de Calidad Ambiental de Puerto Rico (JCA), y el Servicio de Pesca y Vida Silvestre de los Estado Unidos (USFWS por sus siglas en inglés) trabajan conjuntamente como el Equipo del Programa de Restauración (EPR por sus siglas en inglés) de Vieques.

Originalmente el sitio fue un estuario, inter-marea, un humedal boscoso dominado por mangle negro, pero la acción de remediación del 2009 convirtió el sitio en un ambiente de laguna marina poco profunda, de aproximadamente 0.6 acre y de 5 pulgadas a 3 pies de profundidad (Shaw, 2010; CH2M HILL, 2010a). La **Figura ES-2** es una fotografía aérea de SWMU 6 que muestra la densa vegetación en el área de mangle antes de la acción de remoción interina en el 2009.

La **Figura ES-3** presenta un modelo conceptual del sitio (CMS por sus siglas en inglés) para SWMU 6. Aunque el CMS identifica múltiples receptores humanos y ecológicos potenciales e hipotéticos, los únicos receptores humanos de preocupación potencial en el sitio son los consumidores potenciales de peces de tamaño comestible y jueyes (cocolías) de la laguna, como se discute más abajo. La evaluación de riesgos a la salud humanan (HHRA por sus siglas en inglés) que se llevó a cabo después de la remoción y que se presenta en este Reporte FS identifica bifenilos policlorindados (PCBs por sus siglas en inglés) como las únicas sustancias químicas de preocupación (COCs por sus siglas en inglés), basado en el consumo por humanos de peces de tamaño comestible y jueyes. . Las concentraciones de PCBs que presentan un riesgo inaceptable para el consumo humano se pueden atribuir posiblemente al consumo de PCB de los sedimentos en SWMU 6 y la subsecuente bio-acumulación en los peces y jueyes.

La evaluación de riesgo ecológico (ERA por sus siglas en inglés) que se llevó a cabo después de la acción de remoción que se presenta en este Reporte FS identificó cadmio, cobre, plomo y zinc como los únicos COCs ecológicos, basado en la exposición directa de receptores tróficos de bajo nivel a estos metales en el sedimento.

Basado en los resultados de las evaluaciones HHRA y ERA, se amerita una evaluación de las alternativas de remediación potenciales para los sedimentos de SWMU 6 (por ejemplo, identificar la fuente de los COCs identificados para la salud humana y la biota). No se identificaron riesgos inaceptables para receptores potenciales/hipotéticos humanos o ecológicos por exposición a los suelos, agua subterránea, o agua superficial;

esta última representa la expresión superficial del agua subterránea en SWMU 6. Por lo que no es necesaria una acción de remediación para estos medios.

Basado en la información arriba descrita, los objetivos de la acción de remediación (RAOs por sus siglas en inglés) para SWMU 6 son los siguientes:

- Prevenir la exposición de las personas a PCBs en peces de tamaño comestible y jueyes a concentraciones que pudieran presentar un riesgo inaceptable.
- Asegurar que la comunidad béntica (si se mantiene) no se vea afectada (en relación al trasfondo) por contaminantes relacionados al sitio de tal manera que estos efectos pudieran impactar negativamente la poblaciones de niveles tróficos altos que la usan como fuente de alimento.

Como se muestra en las Figuras ES-4 a ES-9, se desarrollaron seis alternativas de remediación para que sean evaluadas en contra siete criterios de evaluación de factibilidad, como se define en el Plan Nacional de Contingencia (NCP por sus siglas en inglés):

- Alternativa 1—*No Acción*
- Alternativa 2— *Recuperación Natural Monitoreada y Controles de Uso de los Terrenos*
- Alternativa 3— *Excavación, Desagüe, y Disposición Fuera del Sitio de los Sedimentos Contaminados*
- Alternativa 4— *Cubrir con Arena los Sedimentos Contaminados del Sitio, Monitoreo a Largo Plazo y Controles de Uso de los Terrenos*
- Alternativa 5— *Usar una Cubierta Reactiva sobre los Sedimentos Contaminados del Sitio, Monitoreo a largo Plazo y Controles de Uso de los Terrenos*
- Alternativa 6— *Cubrir con Tierra toda la Laguna y Controles de Uso de los Terrenos*

Se llevó a cabo un análisis comparativo para cada una de las alternativas comparándolas con los criterios de evaluación del NCP, como se muestra en la **Tabla ES-1**. El objetivo de este análisis es demostrar las ventajas y desventajas relativas de cada alternativa de remediación para que se puedan evaluar las determinaciones claves durante el proceso de toma de decisiones.

Este Reporte FS apoyará la selección de la acción de remediación preferida. Antes de la selección de la acción, se preparará y proveerá para comentarios públicos un Plan para la Acción de Remediación Propuesta (PRAP por sus siglas en inglés), el cual documentará la alternativa preferida por la Marina y USEPA. Después de que los comentarios sustanciales del público hayan sido considerados, la acción de remediación seleccionada será documentada en un Récord de Decisión (ROD por sus siglas en inglés) para SWMU 6.

TABLE ES-1
Comparative Analysis of Remedial Alternatives
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Criteria	Alternative 1 - No Action	Alternative 2 - Monitored Natural Recovery and LUCs	Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment	Alternative 4 - In-situ Sand Capping of Contaminated Sediment, LTM, and LUCs	Alternative 5 - In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs	Alternative 6 - Intertidal Forested Wetland Restoration and LUCs
Overall protection of human health and the environment	○	●	●	●	●	●
Compliance with ARARs	○	●	●	●	●	●
Long-term effectiveness and permanence	◔	◕	◕	◕	◕	●
Reduction of toxicity, mobility, or volume through treatment	○	◔	◕	◒	◒	◒
Short-term effectiveness[1]	○	◕	◔	◒	◒	◕
Implementability	○	●	◔	◕	◕	◒
Cost (Net Present Value 2012)[2]	$139,000	$508,000	$1,437,000	$818,000	$907,000	$1,035,000

Notes:

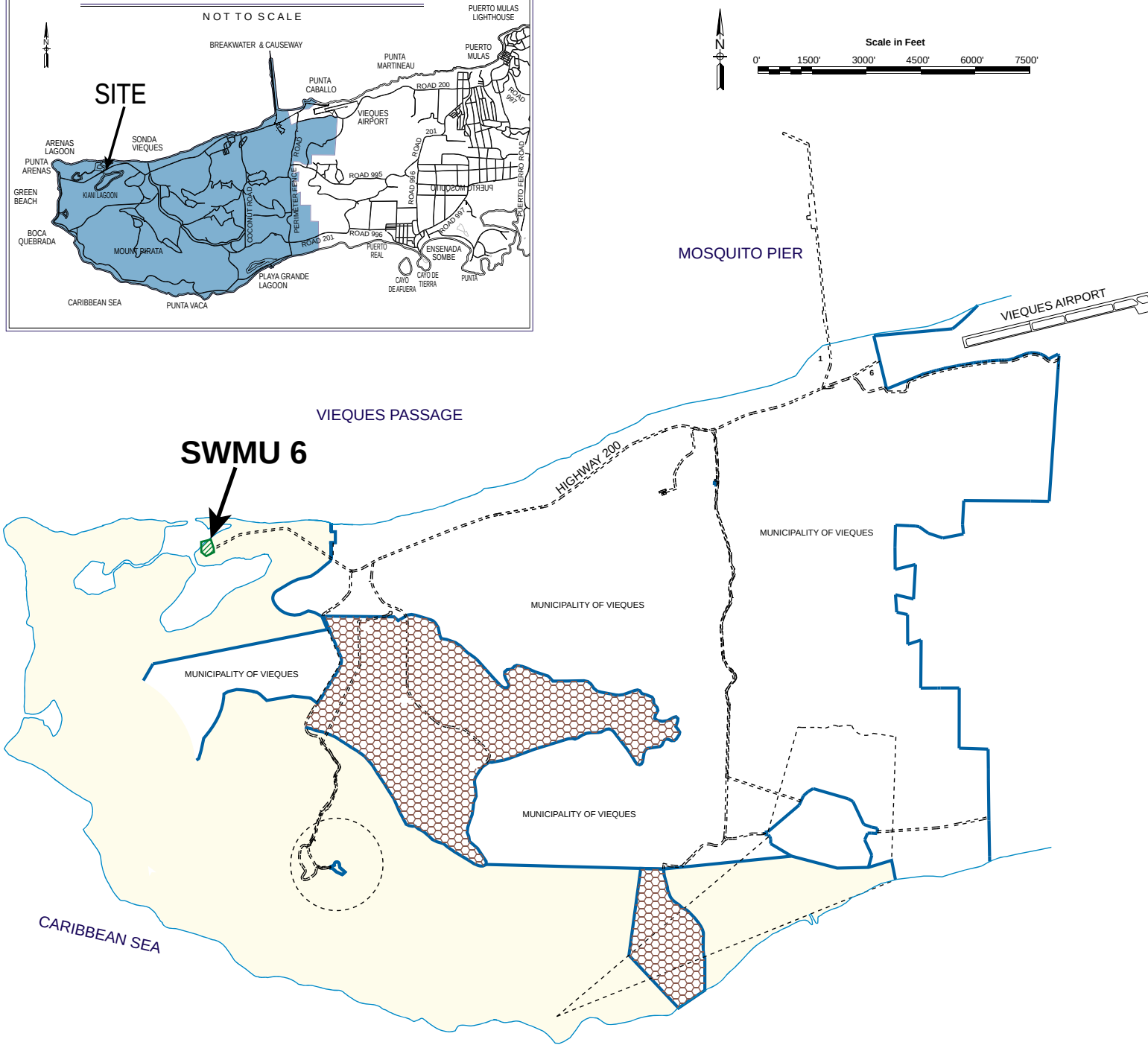
Individual criterion scores: ○ – not met, ◔ – poor, ◒ – satisfactory, ◕ – good, ● – excellent/fully meets.

Rankings are provided as qualitative descriptions of the relative compliance of each alternative with the criteria.

Alternatives 2, 3, 4, and 6 are not technically “treatment” alternatives, but employ technologies that affect toxicity and/or mobility and/or volume of contaminants.

1 The remedial timeframe and sustainability footprint in terms of projected greenhouse gas (GHG) emissions, air emissions, energy consumptions, and accident risk were factored in the scoring of each alternative.

2 The cost represents a +50/-30% range of accuracy, based on estimates prepared in accordance with USEPA cost estimating guidance.



LEGEND

- PROPERTY LINE
- EASEMENT LINE
- APPROXIMATE EDGE OF WATER
- UNITED STATES GOVERNMENT\ DEPARTMENT OF THE INTERIOR
- PUERTO RICO CONSERVATION TRUST

SOURCE:
VIEQUES NASD SURVEY LAND TRANSFER & DISPOSAL OVERALL LOCATION SURVEY
PREPARED BY GLENN & SADLER AND LUIS BERRIOS MONTES & ASSOCIATES

FIGURE ES-1
SWMU 6 Site Location Map
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

Aerial Photograph 2007

LEGEND

SWMU 6 Access Restriction Boundary

North

0 300 600 Feet

Note: *The aerial photograph shows the dense vegetation in the mangrove area prior to the interim removal activity in 2009.*

FIGURE ES-2
Aerial Photograph of SWMU 6 (2009)
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

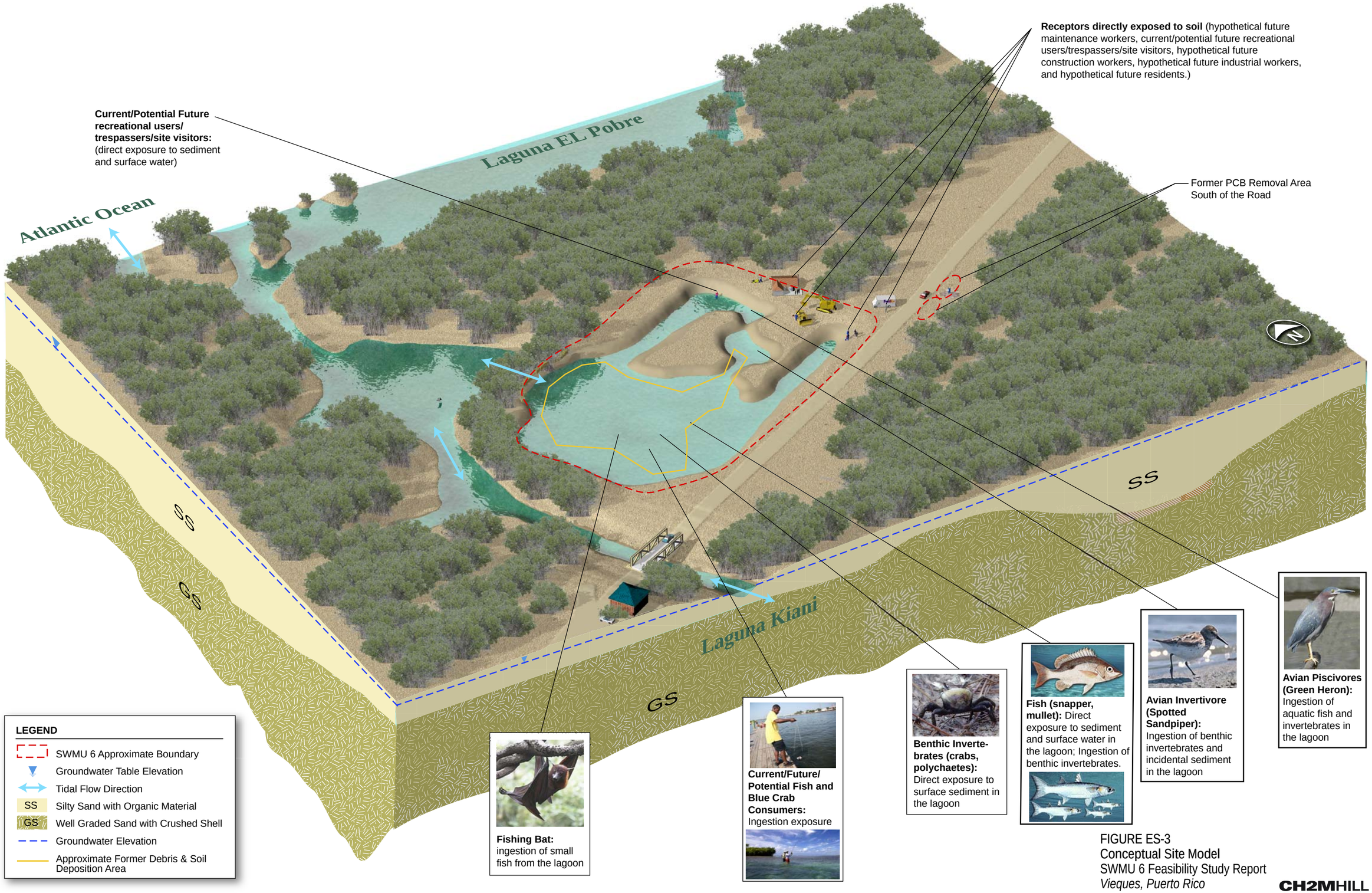


FIGURE ES-3
Conceptual Site Model
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

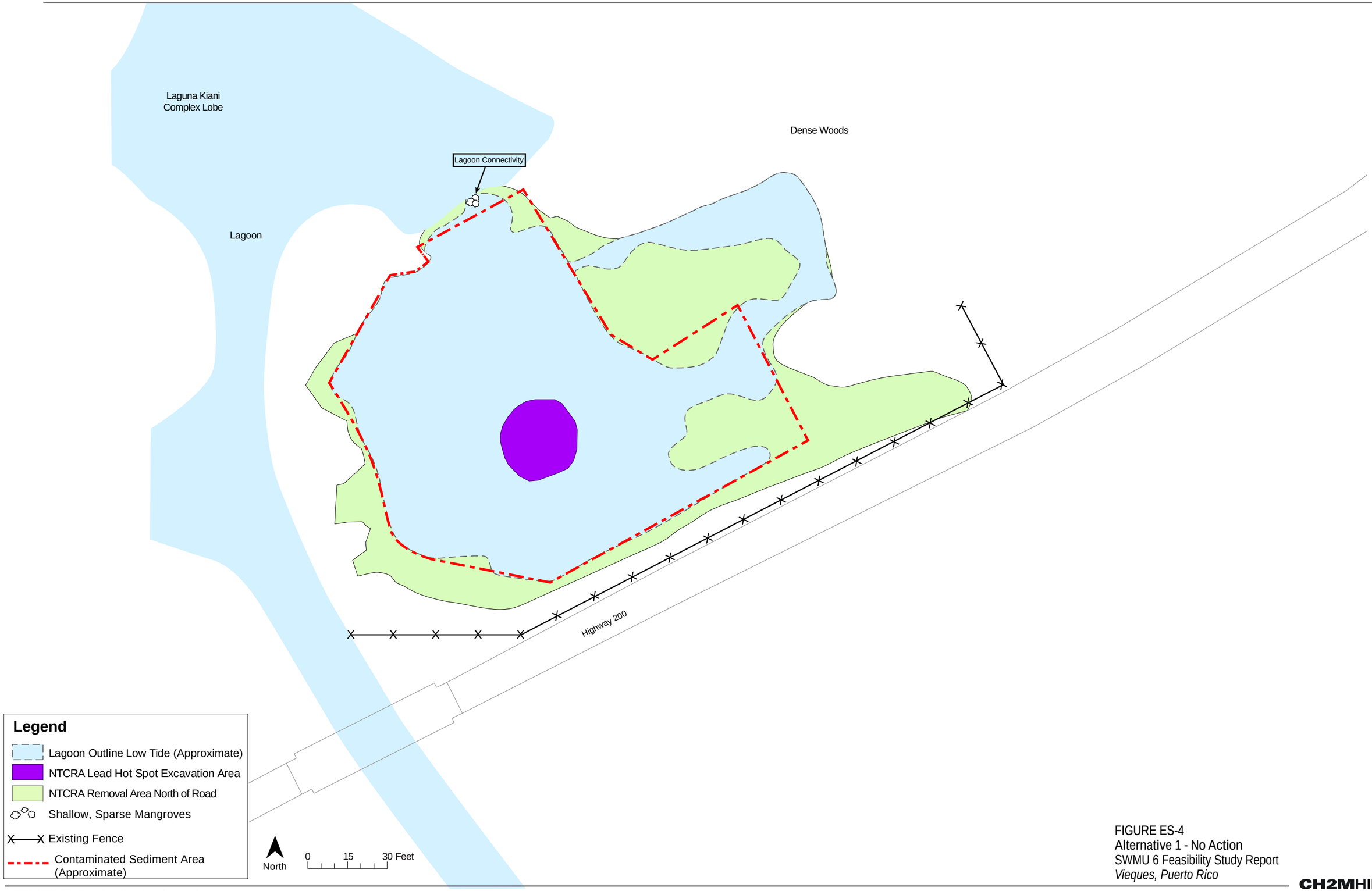


FIGURE ES-4
Alternative 1 - No Action
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

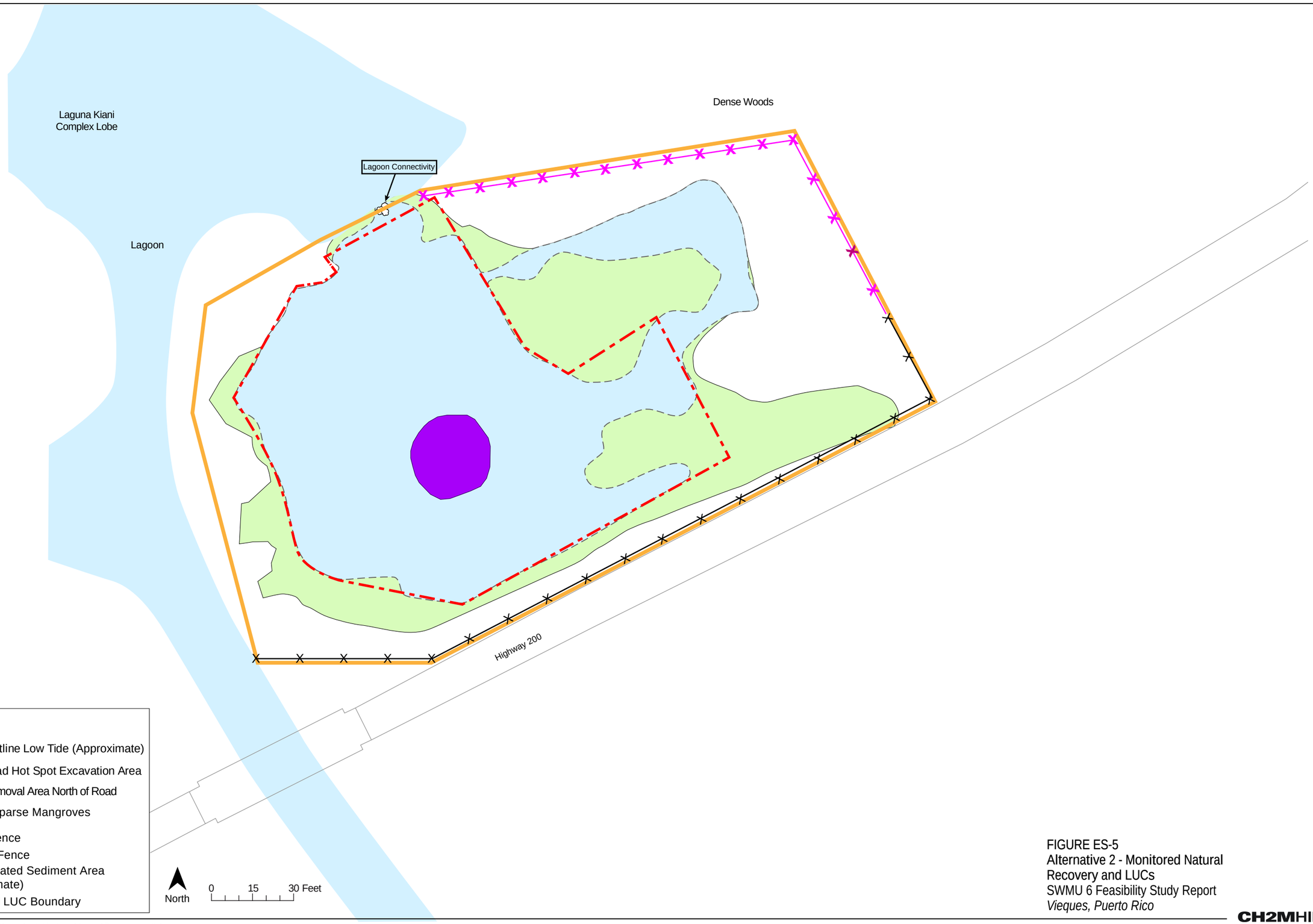


FIGURE ES-5
Alternative 2 - Monitored Natural Recovery and LUCs
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

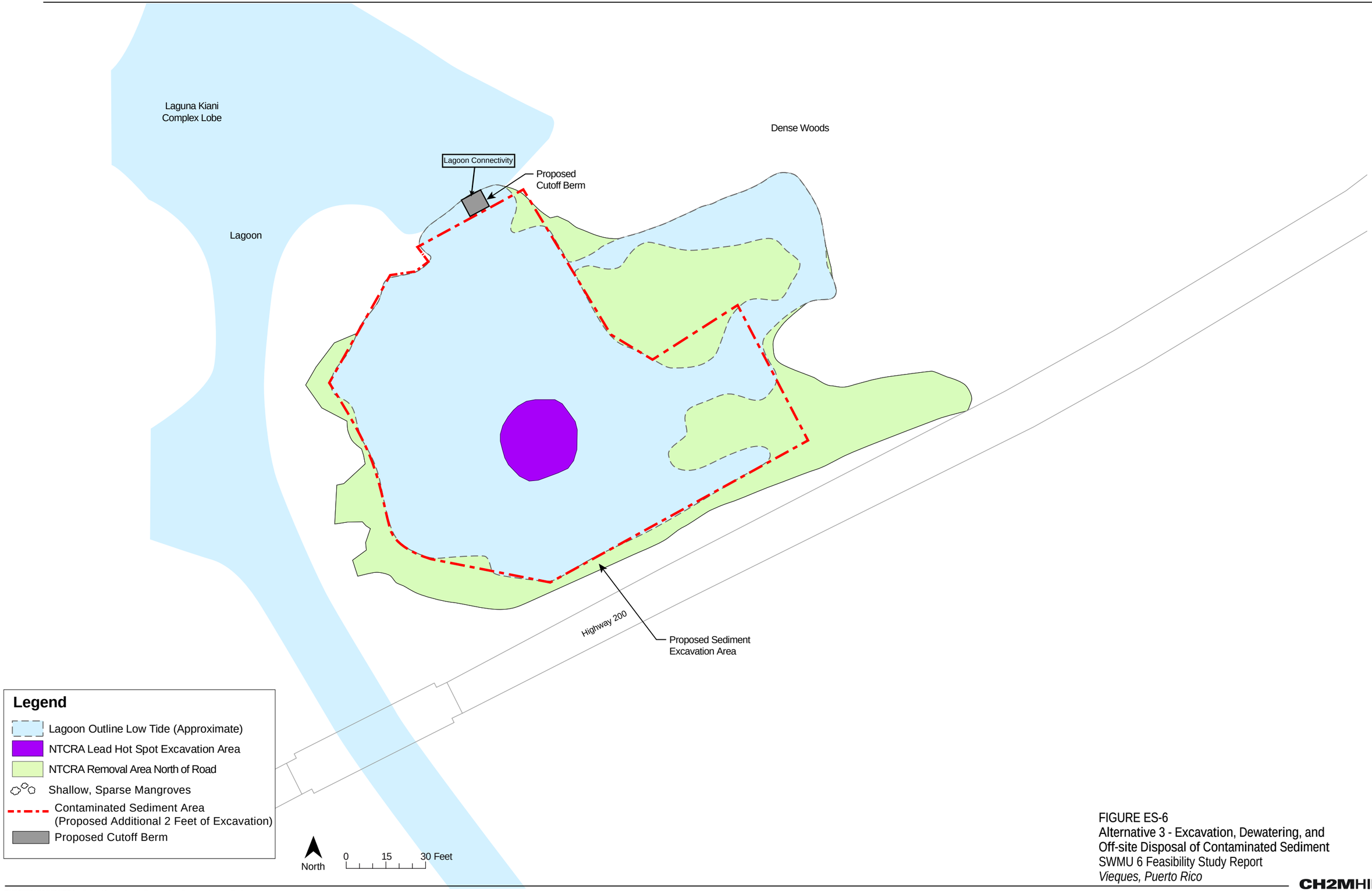


FIGURE ES-6
Alternative 3 - Excavation, Dewatering, and
Off-site Disposal of Contaminated Sediment
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

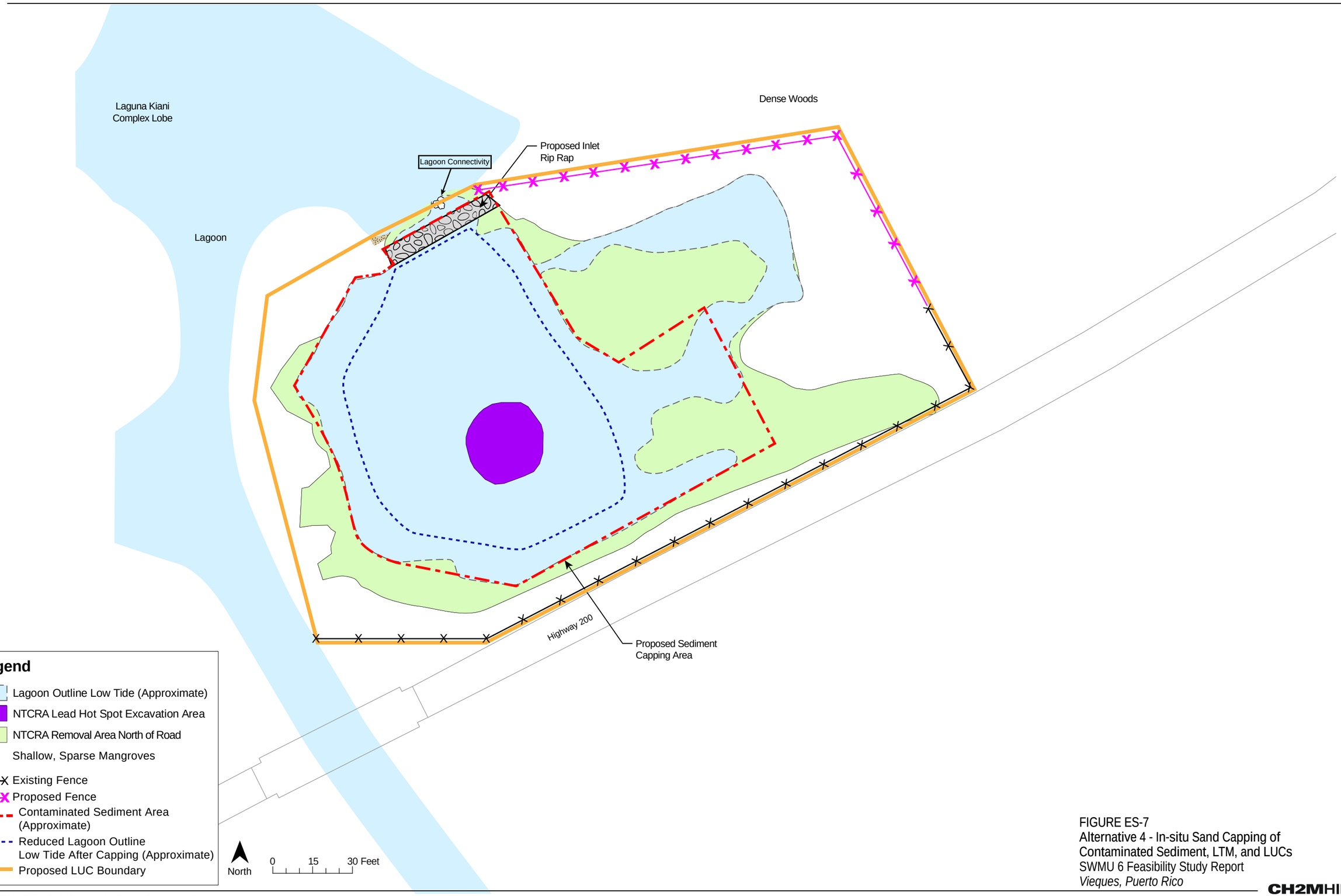


FIGURE ES-7
Alternative 4 - In-situ Sand Capping of
Contaminated Sediment, LTM, and LUCs
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

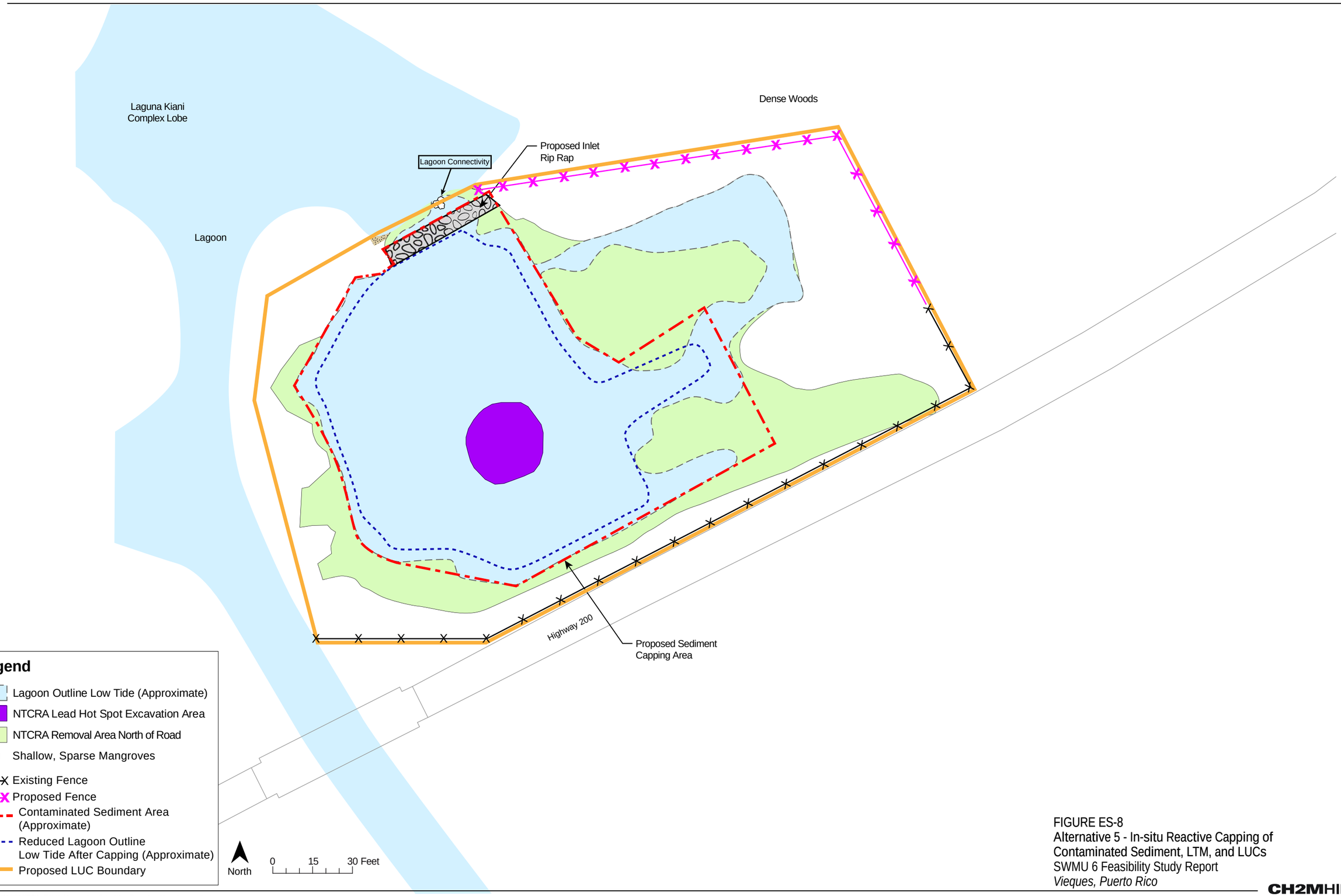


FIGURE ES-8
Alternative 5 - In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

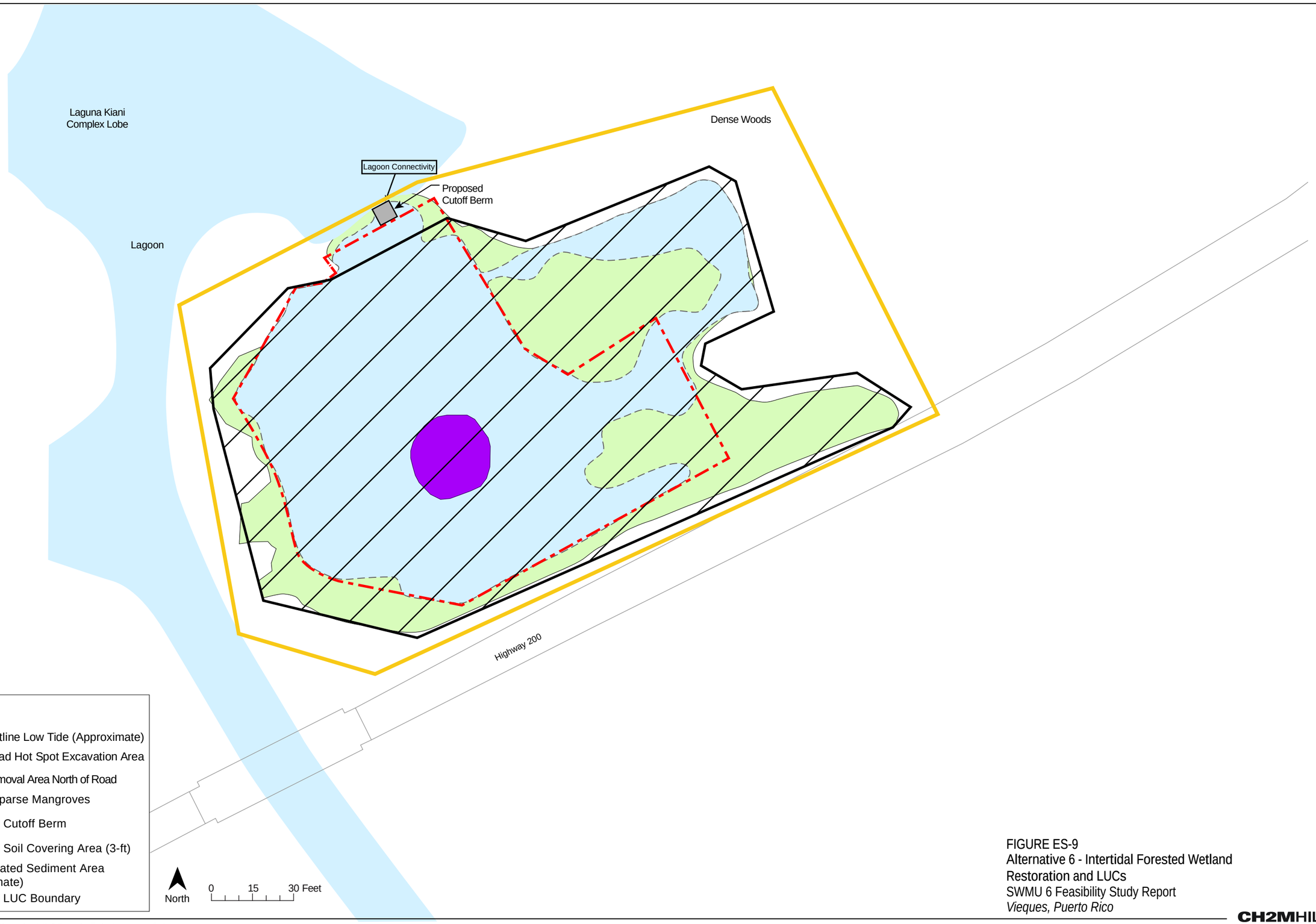


FIGURE ES-9
Alternative 6 - Intertidal Forested Wetland Restoration and LUCs
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

Contents

Executive Summary ..... **i**

Resumen Ejecutivo ..... **i**

Contents ..... **i**

Acronyms and Abbreviations ..... **v**

1 Introduction **1-1**
1.1 Purpose 1-1
1.2 Report Organization 1-2

2 Site Background **2-1**
2.1 Site Description 2-1
2.2 Investigation History and Interim Removal Action 2-2
2.3 Post-removal Conceptual Site Model 2-3
2.3.1 Post-removal Contaminant Distribution 2-4

3 Post-removal Human Health Risk Assessment Summary **3-1**
3.1 Chemicals of Potential Concern 3-1
3.2 Exposure Evaluation 3-3
3.3 Risk Estimates 3-4
3.4 Chemicals of Concern 3-5

4 Post-Removal Ecological Risk Assessment Summary **4-1**
4.1 ERA Process and Objectives 4-1
4.2 Ecological Setting 4-1
4.3 Analytical Data Used in the ERA 4-2
4.4 ERA Results 4-3
4.4.1 Aquatic Habitats – SWMU 6 Lagoon 4-3
4.4.2 Aquatic Habitats – Laguna Kiani Complex Lobe 4-5
4.4.3 Aquatic Habitats – PCB Removal Areas 4-5
4.4.4 Terrestrial Habitats 4-5
4.5 ERA Summary and Conclusions 4-6

5 Identification and Screening of Technologies **5-1**
5.1 Applicable or Relevant and Appropriate Requirements 5-1
5.2 Remedial Action Objectives 5-2
5.3 Contaminants of Concern 5-2
5.4 Preliminary Remedial Goals 5-2
5.5 General Response Actions 5-3
5.6 Identification and Screening of Remedial Technologies 5-3
5.6.1 Description of Technologies 5-4
5.6.2 Retained Technologies 5-5
5.7 Sustainability 5-6

6 Development of Remedial Alternatives **6-1**
6.1 Alternative 1 – No Action 6-1
6.2 Alternative 2 – Monitored Natural Recovery and Land Use Controls 6-1
6.3 Alternative 3 – Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment 6-2

6.4 Alternative 4 – In-situ Sand Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls 6-3
6.5 Alternative 5 – In-situ Reactive Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls 6-4
6.6 Alternative 6 – Intertidal Forested Wetland Restoration and Land Use Controls 6-5

7 Detailed Analysis of Remedial Alternatives 7-1
7.1 Evaluation Criteria 7-1
7.1.1 Threshold Criteria 7-1
7.1.2 Balancing Criteria 7-1
7.1.3 Modifying Criteria 7-3
7.2 Individual Analysis of Alternatives 7-3
7.2.1 Criteria Assessment of Alternative 1 7-3
7.2.2 Criteria Assessment of Alternative 2 7-4
7.2.3 Criteria Assessment of Alternative 3 7-5
7.2.4 Criteria Assessment of Alternative 4 7-5
7.2.5 Criteria Assessment of Alternative 5 7-6
7.2.6 Criteria Assessment of Alternative 6 7-7
7.3 Comparative Analysis of Alternatives 7-8
7.3.1 Overall Protection of Human Health and the Environment 7-8
7.3.2 Compliance with ARARs 7-8
7.3.3 Long-Term Effectiveness and Permanence 7-8
7.3.4 Reduction of TMV Through Treatment 7-8
7.3.5 Short-Term Effectiveness 7-8
7.3.6 Implementability 7-9
7.3.7 Cost 7-9

8 References 8-1

List of Tables (provided at the end of each section)

ES-1 Comparative Analysis of Remedial Alternatives

2-1 Post-Removal Surface Soil Detection and Exceedance Summary
2-2 Post-Removal Sediment Detection and Exceedance Summary
2-3 Post-Removal Surface Water Detection and Exceedance Summary
2-4 Post-Removal Biota Detection Summary
2-5 Post-Removal Maximum Biota Tissue PCB and Metal Concentration Summary

5-1(a) Federal Chemical-Specific ARARs
5-1(b) Puerto Rico Chemical-Specific ARARs
5-1(c) Federal Location-Specific ARARs
5-1(d) Puerto Rico Location-Specific ARARs
5-1(e) Federal Action-Specific ARARs
5-1(f) Puerto Rico Action-Specific ARARs
5-2 Calculation of Sediment Preliminary Remedial Goal for Protection of Human Health
5-3 Technology Screening Summary

7-1 Detailed Evaluation of Remedial Alternatives
7-2 Summary of Cost Estimates for Remedial Alternatives
7-3 Comparative Analysis of Remedial Alternatives

List of Figures (provided at the end of each section)

ES-1 SWMU 6 Site Location Map
ES-2 Aerial Photograph of SWMU 6 (2009)
ES-3 Conceptual Site Model
ES-4 Alternative 1 – No Action
ES-5 Alternative 2 – Monitored Natural Recovery and LUCs
ES-6 Alternative 3 – Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment
ES-7 Alternative 4 – In-situ Sand Capping of Contaminated Sediment, LTM, and LUCs
ES-8 Alternative 5 – In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs
ES-9 Alternative 6 – Intertidal Forested Wetland Restoration and LUCs

1-1 SWMU 6 Site Location Map
1-2 Aerial Photograph of SWMU 6 (2009)

2-1 Conceptual Site Model
2-2 Post-removal Biota PCB Concentrations
2-3 Post-removal Sediment Metals COC Concentrations
2-4 Post-removal Surface Water Metals COC Concentrations

3-1 Conceptual Model for HHRA

4-1 Conceptual Model for ERA

6-1 Alternative 1 – No Action
6-2 Alternative 2 – Monitored Natural Recovery and LUCs
6-3 Alternative 3 – Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment
6-4 Alternative 4 – In-situ Sand Capping of Contaminated Sediment, LTM, and LUCs
6-5 Alternative 5 – In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs
6-6 Alternative 6 – Intertidal Forested Wetland Restoration and LUCs

List of Appendixes (provided on CD)

A Post-Removal Surface Soil, Sediment, and Surface Water Data Tables

B Post-Removal Biota Data Tables

C SWMU 6 Surface Water and Sediment Background Study

D Data Quality Evaluation and Data Validation Reports

E Post-Removal Human Health Risk Assessment

F Post-Removal Ecological Risk Assessment

G Cost Estimate for Alternatives

H Sustainability Analysis Summary

I West Vieques Sediment Pesticide Detection Table

J Final Response to USEPA, PREQB and USFWS Comments

Acronyms and Abbreviations

4,4-DDD	4,4-dichlorodiphenyldichloroethane
4,4-DDE	4,4-dichlorodiphenyldichloroethene
4,4-DDT	4,4-dichlorodiphenyltrichloroethane
AOC	Area of Concern
ARAR	applicable or relevant and appropriate requirement
AVS/SEM	acid volatile sulfide/simultaneously extractable metals
BERA	baseline ecological risk assessment
bgs	below ground surface
CD-ROM	compact disk read-only memory
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CLEAN	Comprehensive Long-term Environmental Action—Navy
CO_2e	carbon dioxide equivalents
CO_2	carbon dioxide
COC	chemical of concern
COPC	chemical of potential concern
CSM	Conceptual Site Model
CTO	Contract Task Order
DO	dissolved oxygen
DoD	U.S. Department of Defense
DOI	Department of the Interior
DON	Department of the Navy
EE/CA	Engineering Evaluation/Cost Analysis
EqP	Equilibrium-Partitioning
ERA	Ecological Risk Assessment
ERP	Environmental Restoration Program
ft	ft
FS	Feasibility Study
GHGs	Greenhouse gases
GRA	General Response Action
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient
ICs	Institutional Controls
IR	Navy Installation Restoration
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
LTM	long-term monitoring

LUCs	Land Use Controls
MCLs	Maximum Contaminant Levels
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
MNR	Monitored Natural Attenuation
MOV	Municipality of Vieques
N2O	nitrous oxide
NA	not available/not applicable
NASD	Naval Ammunition Support Detachment
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NCP	National Contingency Plan
NIRIS	Navy Installation Restoration Information System
NOAA	National Oceanic and Atmospheric Administration
NOx	nitrogen oxides
NPL	National Priorities List
NPV	Net Present Value
NTCRA	Non-Time Critical Removal Action
O&M	Operation and Maintenance
PA/SI	Preliminary Assessment/Site Investigation
PAHs	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PDF	portable document format
PEST/PCB	pesticides/polychlorinated biphenyls
pg/g	picograms per gram
PM10	Particulate Matter with a diameter of 10 micrometers or less
PRAP	Proposed Remedial Action Plan
PREQB	Puerto Rico Environmental Quality Board
RAGs	Risk Assessment Guidance for Superfund
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SD	Sediment
SERA	Screening Ecological Risk Assessment
SOP	standard operating procedure
SOx	Sulfur oxides
SS	Surface Soil
SW	Surface Water
SWMU	Solid Waste Management Unit
TBC	to-be-considered
TOC	Total organic carbon

U.S.	United States
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UTL	upper tolerance level
VOC	volatile organic compound

SECTION 1

Introduction

This Feasibility Study (FS) report presents an evaluation of potential remedial alternatives for Solid Waste Management Unit (SWMU) 6, the Former Mangrove Disposal Site, located on the Former Naval Ammunition Support Detachment (NASD), Vieques, Puerto Rico **(Figure 1-1)**.

The Navy ceased facility-wide operations on the former NASD on April 30, 2001, when the land was transferred to the Department of the Interior (DOI), the Municipality of Vieques (MOV), and Conservation Trust (CH2M HILL, 2007). SWMU 6 is located on DOI property that is part of the Vieques National Wildlife Refuge. The United States Department of the Navy (Navy), United States Environmental Protection Agency (USEPA) Region II, Commonwealth of Puerto Rico Environmental Quality Board (PREQB), and United States Fish and Wildlife Service (USFWS) work jointly as the Vieques Environmental Restoration Program (ERP) Team.

The site was used for the disposal of general solid waste during the 1960s and 1970s from Navy operations within the former NASD. The Remedial Investigation (RI) conducted at SWMU 6 evaluated the nature and extent of contamination, and did not identify unacceptable risks to human health or the environment (CH2M HILL, 2007). However, due to the uncertainty associated with this conclusion because soil samples were collected adjacent to the waste rather than directly through the waste because of safety concerns, as well as the potential for the waste piles at SWMU 6 to be a future source of contamination, an interim removal action was completed in 2009 as a non-time-critical removal action (NTCRA) (Shaw, 2007).

The site was originally an estuarine, intertidal, forested wetland dominated by black mangrove, but the 2009 interim removal action altered the site to a shallow marine lagoon environment, approximately 0.6 acre and 5 inches to 3 feet deep (Shaw, 2010; CH2M HILL, 2010a). **Figure 1-2** is an aerial photograph of SWMU 6 that shows the dense vegetation in the mangrove area prior to the interim removal action in 2009.

Following the interim removal action, post-removal surface water, sediment, and biota sampling was conducted, the data from which were used to evaluate risks to potential and hypothetical human and ecological receptors. The human health risk assessment (HHRA) identified polychlorinated biphenyls (PCBs) as the only human health chemicals of concern (COCs), based on human consumption of edible-size fish/blue crab. The PCB concentrations posing unacceptable risk for human consumption are likely attributable to PCB uptake from sediment at SWMU 6 and subsequent bioaccumulation in the fish and crab. The post-removal ecological risk assessment (ERA) identified cadmium, copper, lead, and zinc as the only ecological COCs, based on direct exposure to these metals in sediment by lower trophic level receptors.

Based on the results of the HHRA and ERA, evaluation of potential remedial alternatives for SWMU 6 sediment (i.e., the source of COCs identified for biota) is warranted. No unacceptable risks were identified for potential/hypothetical human or ecological receptors exposed to soil, groundwater, or surface water, the latter representing the surface expression of groundwater at SWMU 6. Therefore, no remedial action is necessary for these media.

1.1 Purpose

The objectives of the SWMU 6 FS are to develop remedial action objectives (RAOs) and develop and evaluate remedial alternatives to meet the RAOs.

Pursuant to the USEPA FS Guidance (USEPA, 1988), the remedial alternatives were evaluated with respect to the following seven National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria:

- Overall protection of human health and the environment
- Compliance with applicable or relevant and appropriate requirements (ARARs)
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume
- Short-term effectiveness

- Implementability
- Cost

Two other NCP criteria (State/Commonwealth acceptance and community acceptance) will be evaluated following the public comment period. The information presented herein will be used by the ERP Team to propose a remedial alternative that complies with the requirements of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the NCP.

This FS Report was prepared under the Navy Naval Facilities Engineering Command (NAVFAC), Atlantic Division, Comprehensive Long-Term Environmental Action - Navy (CLEAN) Contract N62470-11-D-8012, CTO-013, for submittal to the Navy, USFWS, USEPA Region 2, and PREQB.

The FS Report was developed in accordance with the CERCLA 1980 requirements, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and implemented by the NCP and USEPA's FS guidance (USEPA, 1988) and sustainable remediation guidance (USEPA, 2008). Consistent with the CERCLA process, this FS Report will support the selection of a preferred remedy. Prior to the selection of the remedy, the Proposed Remedial Action Plan (PRAP), which documents the Navy's and USEPA's preferred remedy, will be prepared and provided for public comment. Following consideration of substantive public comments, the selected remedy will be documented in the Record of Decision (ROD) for SWMU 6.

1.2 Report Organization

The FS Report is organized as follows:

Section 1 – Introduction, presents the purpose of the FS and organization of the FS Report.

Section 2 – Site Background, presents the site description, site history, summary of previous site investigations and interim removal actions, post-removal description of contamination, and Conceptual Site Model (CSM).

Section 3 – Post-Removal Human Health Risk Assessment Summary, summarizes the post-removal HHRA that is presented in Appendix E.

Section 4 – Post-Removal Ecological Risk Assessment Summary, summarizes the post-removal ERA that is presented in Appendix F.

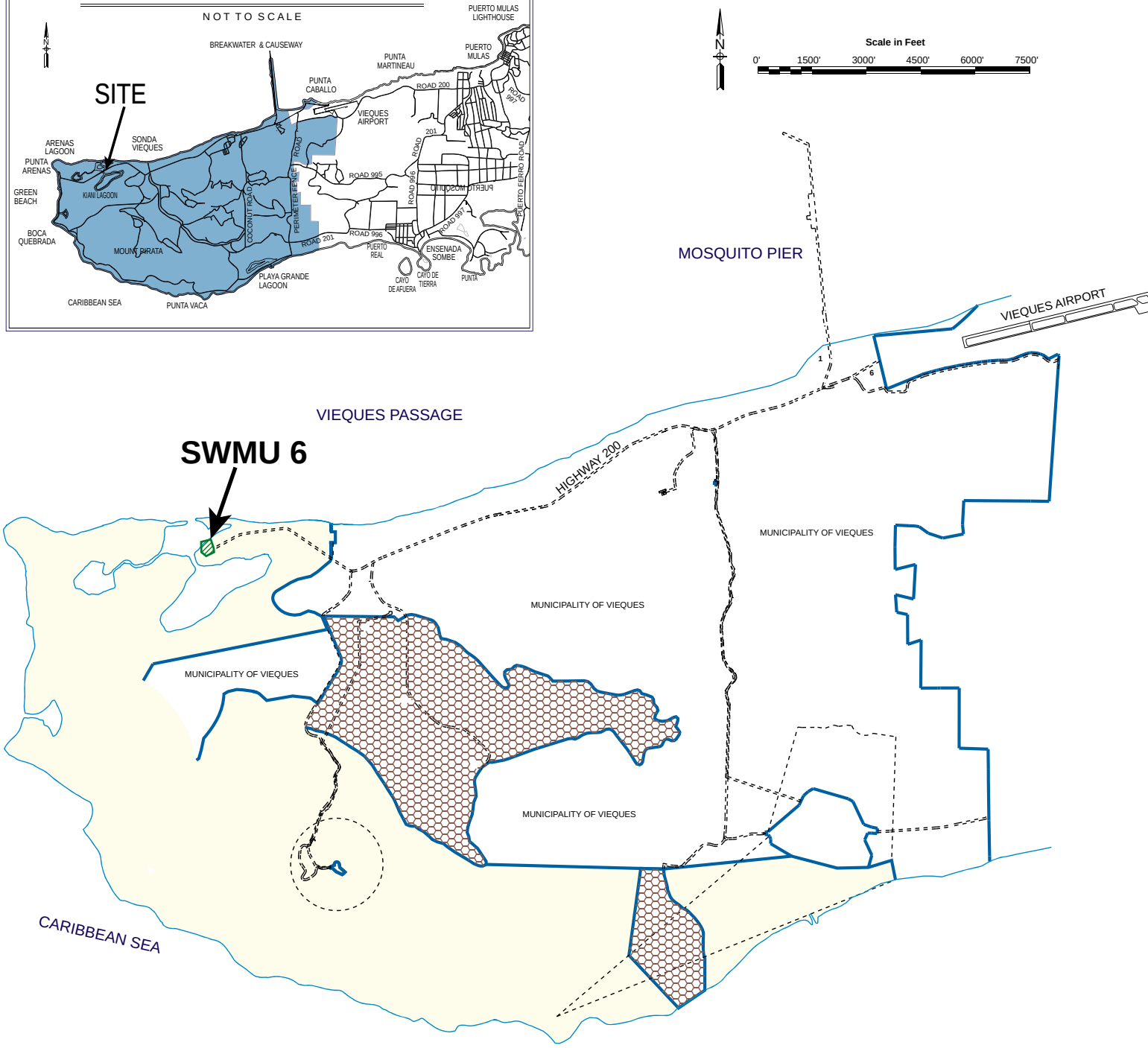
Section 5 – Identification and Screening of Technologies, describes the Applicable or Relevant and Appropriate Requirements (ARARs) and to-be-considered (TBC) criteria, the RAOs, preliminary remediation goals (PRGs), general response actions (GRAs), sustainability analysis methodology, as well as identification and screening of technologies.

Section 6 – Development of Remedial Alternatives, describes the development of six alternatives.

Section 7 – Detailed Analysis of Remedial Alternatives, presents an individual and comparative analysis of the six alternatives.

Section 8 – References, cites references used in this FS Report.

Tables and figures are provided at the end of each respective section. Appendices are provided electronically in portable document format (PDF) on a compact disk read-only memory (CD-ROM).



LEGEND

- PROPERTY LINE
- EASEMENT LINE
- APPROXIMATE EDGE OF WATER
- UNITED STATES GOVERNMENT\ DEPARTMENT OF THE INTERIOR
- PUERTO RICO CONSERVATION TRUST

SOURCE:
VIEQUES NASD SURVEY LAND TRANSFER & DISPOSAL OVERALL LOCATION SURVEY
PREPARED BY GLENN & SADLER AND LUIS BERRIOS MONTES & ASSOCIATES

FIGURE 1-1
SWMU 6 Site Location Map
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

Aerial Photograph 2007

LEGEND

SWMU 6 Access Restriction Boundary

North

0 300 600 Feet

Note: *The aerial photograph shows the dense vegetation in the mangrove area prior to the interim removal activity in 2009.*

FIGURE 1-2
Aerial Photograph of SWMU 6 (2009)
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

SECTION 2

Site Background

This section presents a general summary of the site description, site history, summary of previous site investigations and interim removal actions, post-removal contaminant distribution, and CSM. More detailed information is provided in the following documents:

- *Final Remedial Investigation Report, Solid Waste Management Unit (SWMU) 6, Former Naval Ammunition Support Detachment, Vieques Island, Puerto Rico. (CH2M HILL, 2007), hereafter referred to as "Final RI Report."*
- *Final Completion Report, Removal Actions SWMU 6, SWMU 7, AOC J, and AOC R, Former Naval Ammunitions Support Detachment, Vieques, Puerto Rico. (Shaw, 2010).*
- *Final Post-Removal Supplemental Confirmatory Sampling and Analysis Plan, SWMU 6, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico. (CH2M HILL, 2010a), hereafter referred to as "Post-Removal SAP."*
- *Final Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Addendum, SWMU 6, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico. (CH2M HILL, 2012), hereafter referred to as "Post-Removal SAP Addendum."*

This section does not repeat the detailed information already presented in the Final RI Report, removal action completion report, and Post-Removal SAP and Addendum, but instead summarizes relevant site background information and updated contaminant distribution to support the FS evaluation. Additions and modifications to the information summarized from the aforementioned sources are based on data collected during the post-removal sediment, surface water, and biota sampling activities.

2.1 Site Description

SWMU 6 is a relatively shallow mangrove lagoon located approximately 1,000 feet south of Vieques Passage. The site is just over 0.6 acre in area and is bounded on the west by a canal that connects Laguna El Pobre and Kiani Lagoon South. Highway 200, which is used to access Green Beach, a public beach further to the west, runs east-west through the southern end of the site access restriction boundary (**Figure 1-2**). SWMU 6 is currently hydrologically connected to the Kiani Lagoon complex through a small opening at its north end, and is mostly inundated with seawater during tidal cycles.

The site was used for the disposal of general solid waste during the 1960s and 1970s from Navy operations within the former NASD. Waste discarded at the site included empty containers of lubricants, oil, solvents, and paints; broken glass; and rubble. No munitions and explosives of concern (MEC) were identified at the site; however, munitions-related items such as inert concrete-filled practice bombs, empty bomb dispensers, and empty shell casings were identified. Items identified at the site were deteriorated from natural corrosion in the saltwater environment. The area of debris disposal was approximately 260 feet wide and 180 feet long. The main debris pile was north of Road 200, approximately 200 feet long and 10 feet wide by three feet deep. There were also additional smaller piles throughout the area (Shaw, 2007).

The waste pile and contaminated soil were removed during an interim removal action in 2009. The overall goal of the interim removal action was to eliminate the uncertainty of the debris being a potential future source of contamination by removing the debris and associated contaminated soil, where present.

Prior to the removal action, the SWMU 6 site was predominantly an estuarine, intertidal, forested wetland dominated by black mangrove and intermittently inundated at high tide. Following the removal action, the site remained as a wetland habitat, but the lowered site topography resulted in a predominantly shallow (approximately 5 inches to 3 feet deep) open water lagoon, with deeper portions permanently inundated and supportive of a variety of aquatic fish and invertebrates. Aquatic organisms include anchovies, gobies, puffers,

mojarras, mullet, needlefish, snook, blue crabs, hermit crabs, fiddler crab, grass shrimp, and upside-down jellyfish. Extensive shallow areas occur surrounding the SWMU 6 lagoon, especially on the east side, where red and black mangroves are becoming re-established and sediment is exposed at low tide. Various wildlife have been observed foraging along the exposed sediment and shallow water areas including great egret, great blue heron, black-bellied plover, semipalmated plover, ruddy turnstone, and greater yellowlegs. A chain-link fence with signs posted to deter trespassers exists along the southern lagoon boundary, adjacent to Route 200. There is no boat access to the site; the water connection on the north and west sides of the lagoon is blocked by a thick stand of red mangrove. There is public access (e.g., fishing, kayaking) to the nearby waters of Laguna Kiani via a vehicle/pedestrian bridge and small earthen boat ramp adjacent to the southwest corner of SWMU 6. The new environmental setting at SWMU 6 resulted in changed exposure pathways to human and ecological receptors, relative to pre-removal conditions. The site is managed and protected as part of the Vieques National Wildlife Refuge by DOI's USFWS, Caribbean Division. Due to the potential for trespassing (e.g., fishing/crabbing) and residual sediment contamination, access to the site is currently partially restricted by a chain-link fence with signage to discourage trespassing, including fishing/crabbing.

2.2 Investigation History and Interim Removal Action

A chronological list of previous investigations and the interim removal action, as well as key milestone dates, at SWMU 6 is presented below:

- **Initial Assessment Study and Environmental Baseline Survey (1998- 2000)** - Collection of 8 surface soil samples, 5 surface water samples, and 5 sediment samples. Results of these investigations are provided in the *Final Environmental Baseline Survey, Naval Ammunition Support Detachment, Vieques, Puerto Rico* (Program Management Company, 2000).
- **Expanded Preliminary Assessment/Site Investigation (PA/SI) (2000)** - A geophysical survey; installation and sampling of 4 wells (MW-01 through MW-04); and collection of 7 surface water samples, 7 sediment samples, 8 surface soil samples, and 4 subsurface soil samples. Results of this investigation are provided in the *Final Expanded Preliminary Assessment/Site Investigation*, *U.S. Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico* (CH2M HILL, 2000).
- **Remedial Investigation (RI) (2003) –** Installation and sampling of 4 wells (MW-05 through MW-08) and collection of 15 surface soil samples, 7 surface water samples, and 14 sediment samples. Results of this investigation are provided in the *Final Remedial Investigation Report, Solid Waste Management Unit (SWMU) 6, Former Naval Ammunition Support Detachment*, *Vieques Island, Puerto Rico* (CH2M HILL, 2007). The RI Report concluded that the pre-removal conditions at the site did not pose an unacceptable risk to human health or ecological receptors. However, the Navy and regulatory agencies concurred that there was uncertainty associated with this conclusion because soil samples were collected adjacent to the debris rather than directly through the debris due to safety concerns. The agencies also concurred that the debris at SWMU 6 posed an unacceptable uncertainty regarding a potential future source of contamination and therefore warranted removal.
- **Engineering Evaluation/Cost Analysis (EE/CA) (2005)** - An EE/CA was performed to identify and analyze alternatives to address debris and soil containing debris and associated contamination at four sites historically with waste and debris disposal activities, including SWMU 6. A (NTCRA involving excavation, off-site disposal, and site restoration was recommended as the preferred alternative (CH2M HILL, 2005).
- **Interim Removal Action and Completion Report (2009-2010) –** As the NTCRA for SWMU 6, a removal action was conducted at SWMU 6 in 2009 to remove the waste debris and impacted soil, followed by confirmation sampling and site restoration activities (i.e., mangrove planting). The extent of debris removal was based on visual observation; the extent of soil excavation area was defined by pre-removal waste characterization human health and ecological risk assessments (CH2M HILL, 2008a; 2008b), which were summarized in the technical memorandum entitled *Determination of the Disposition of Excavated Soils at SWMU 6* (CH2M HILL, 2008c).

A total of approximately 1,423 tons of soil and debris were removed from an area of 27,500 square feet, with excavation depth of 1 to 2 feet (Shaw, 2010). Some of the solid debris was segregated for off-island recycling and some was disposed of in the Municipality of Vieques (MOV) landfill. The munitions-related debris was segregated and processed at the Navy's Central Processing Center on east Vieques. Other than a small quantity of soil that was shipped off-island as hazardous, the excavated soil was determined to be suitable for use as daily cover on the MOV landfill. Confirmation soil samples were collected following removal action activities. A Final Removal Action Completion Report was prepared in March 2010 (Shaw, 2010).

- **Post-Removal Supplemental Confirmatory Sampling (2011) -** In February 2011, soil, sediment, and surface water samples were collected from SWMU 6 according to the Post-Removal SAP (CH2M HILL, 2010); background surface water and sediment samples were collected from adjacent lagoons, and additional soil removal and confirmation sampling were performed at the two elevated PCB locations along the south side of Highway 200. Post-removal confirmatory soil samples from these elevated PCB locations showed significantly lower PCB concentrations, warranting no further action for these two localized areas, as documented in *SWMU 6 Human Health Risk Assessment Pre-interim Deliverable (Tables and Figures)* (CH2M HILL, 2011a) and *SWMU 6 Ecological Risk Assessment Interim Deliverable* (CH2M HILL, 2011b). The surface water and sediment data were used to preliminarily assess potential human health and ecological risks to receptors. Based on these preliminary assessments, biota sampling was concurred upon by the ERP Team for those sediment constituents significantly contributing to the elevated human health risk estimates.
- **Post-Removal Fish/Crab Sampling (2012)** - In accordance with the Post-Removal SAP Addendum (CH2M HILL, 2011), fish/blue crab sampling was conducted in January and February 2012 for a focused list of parameters to provide tissue data for refining the post-removal HHRA (specifically the risk estimates based on fish/blue crab consumption).

2.3 Post-removal Conceptual Site Model

As a result of the interim removal action, the site is currently predominantly a shallow, tidally influenced, saltwater lagoon that is hydraulically connected to the Kiani Lagoon complex through a small opening at the northern portion of the site. Areas around the perimeter of the site are periodically inundated with water due to tidal fluctuations. Sediment and soil consist of silty sand with organic material and well-graded sand with crushed shells. The site now supports a relatively small community of marine fish and invertebrates, along with foraging wildlife such as wading birds.

Figure 2-1 presents a graphical representation of the CSM for SWMU 6. Although the CSM identifies multiple potential human and ecological receptors, the post-removal HHRA determined the only human receptors of concern at the site are potential consumers of edible-size fish and blue crab from the lagoon due to the presence of elevated PCBs in lagoon sediments, as discussed below. It should be noted that there are various types of receptor scenarios that were evaluated in the HHRA as "potential," but which are not planned or reasonably anticipated because the land is and will continue by law to be part of the Vieques National Wildlife Refuge. Fish and blue crab consumers may have direct contact with sediment and surface water at SWMU 6, and these exposure pathways are quantified under a recreational user/trespasser/site visitor exposure scenario. The exposure frequency and duration assumed for potential recreational users/trespassers/site visitors can be used as conservative estimates for sediment and surface water exposures by potential fish or blue crab consumers. COCs were not identified for sediment or surface water since recreational users/trespassers/site visitors risk estimates for site-related chemicals did not exceed target levels. The land use at SWMU 6 is for preservation of wildlife, not uses such as recreational fishing or industrial or residential development. However, these "potential" scenarios were evaluated in the HHRA as a conservative measure to determine if the site could be considered for unrestricted use. Here, "unrestricted use" is defined under CERCLA as not requiring remediation or controls to be protective of human health or the environment.

The post-removal ERA identified lead and zinc as the only ecological COCs, based on direct exposure to these metals in sediment by lower trophic level receptors.

2.3.1 Post-removal Contaminant Distribution

Tables 2-1, 2-2, and 2-3 provide a summary of detected constituents in the post-removal soil, sediment, and surface water sampling data, respectively, collected in February 2011. **Appendix A** contains the raw analytical data. **Table 2-4 and 2-5** provides a summary of detected constituents and maximum PCBs and metals concentrations, respectively, in blue crab and fish samples for the post-removal biota sampling data collected in January/February 2012. The raw analytical data are included in **Appendix B**. The tables also identify screening value exceedances. The screening values comprise adjusted residential soil RSLs in sediment and soil samples (RSLs adjusted to a hazard index [HI] of 0.1 for noncarcinogenic chemicals), adjusted tap water RSLs in surface water (RSLs adjusted to a hazard index [HI] of 0.1 for noncarcinogenic chemicals), ecological screening values, and fish ingestion RSLs or calculated HHRA Screening Levels [SLs] in biota tissue. A summary of background surface water and sediment data collected from adjacent lagoons and calculated background values (95 percent upper tolerance level of the 95th percentile, known as 95/95 UTLs) are included in Tables 2-2 and 2-3 and in **Appendix C**. Data validation reports for all the post-removal soil, sediment, surface water, and biota data are included in **Appendix D.**

The post-removal HHRA and ERA summaries contained in Sections 3 and 4, respectively, discuss contaminant distribution of constituents of potential concern (COPCs) and identification of COCs for potential human and ecological receptors. As detailed in Section 3, PCBs in fish and blue crab were identified as human health COCs at SWMU 6. **Figure 2-2** presents the maximum PCB concentrations detected in biota tissue samples collected at SWMU 6. As detailed in Section 4, cadmium, copper, lead, and zinc were identified as ecological COCs in SWMU 6 lagoon sediment for direct exposures to lower trophic level receptors. **Figure 2-3** and **Figure 2-4** show the ecological COC concentrations exceeding Marine Sediment Ecological Screening Values (ESVs) and Marine Surface Water ESVs, respectively.

TABLE 2-1
Post-Removal Suface Soil Detection and Exceedance Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	CLEAN Vieques (West) Background Zone Qs	Nov 2011 RSL Residential Soil Adjusted	Vieques ESVs Soil	VWW06-SO132[1]	VWW06-SO136	VWW06-SO137[1]	VWW06-SO142[1]	VWW06-SS012[1]	VWW06-SS013[1]		VWW06-SD008[1]	VWW06-SD011	
Sample ID				116701-06-Z-132	116701-06-Z-136	116701-06-Z-137	116701-06-Z-142	VWW06-SS012-0211	VWW06-SS013-0211	VWW06-SS013P-0211	VWW06-SD008-0211	VWW06-SD011-0211	VWW06-SD011P-0211
Sample Date				06/24/09	06/24/09	06/24/09	06/24/09	02/07/11	02/07/11	02/07/11	2/4/2011	2/4/2011	2/4/2011
Chemical Name													
Volatile Organic Compounds (UG/KG)													
Acetone	--	6,100,000	--	64 UJ	66 UJ	54 UJ	67 UJ	NA	NA	NA	2.7 U	4.6 J	2.5 U
Styrene	--	630,000	64,000	1.7 J	6.6 U	5.4 U	6.7 U	NA	NA	NA	0.58 U	0.52 UJ	0.54 U
Tetrachloroethene	--	8,600	200	6.4 UJ	6.6 UJ	5.4 UJ	6.7 U	NA	NA	NA	2 J	1.7 UJ	2 J
Semivolatile Organic Compounds (UG/KG)													
Benzo(a)anthracene	--	150	--	82 J	66.4	38 U	36 U	NA	NA	NA	2.7 UJ	30.6 J	12.3 J
Benzo(a)pyrene	--	15	--	**122**	**84.7**	38 U	36 U	NA	NA	NA	3.3 UJ	**29.1 J**	**20.4 J**
Benzo(b)fluoranthene	--	150	--	**213**	119 J	27.4 J	30.8 J	NA	NA	NA	3.3 UJ	41.2 J	29.7 J
Benzo(g,h,i)perylene	--	--	--	87	43.2	38 U	36 U	NA	NA	NA	3.3 UJ	17.2 J	13.6 J
Benzo(k)fluoranthene	--	1,500	--	71.6	45.3	38 U	36 U	NA	NA	NA	3.3 UJ	15.2 J	11.7 J
Chrysene	--	15,000	--	91.9	65.1 J	38 U	36 U	NA	NA	NA	2.5 UJ	26.5 J	16.3 J
Fluoranthene	--	230,000	--	101 J	48.5 J	240 U	220 U	NA	NA	NA	2.6 UJ	43.6 J	13.9 J
Indeno(1,2,3-cd)pyrene	--	150	--	126	60.8	38 U	36 U	NA	NA	NA	3.3 UJ	16.8 J	13.3 J
PAH HMW	--	--	18,000	*	539.8	*	*	*	*	*	*	222.7	137.8
PAH LMW	--	--	29,000	*	808.5	*	*	*	*	*	*	95.9	53.5
Phenanthrene	--	--	--	190 U	190 U	240 U	220 U	NA	NA	NA	2.6 UJ	17.5 J	11.3 UJ
Pyrene	--	170,000	--	99.5 J	40.3 J	240 U	220 U	NA	NA	NA	2.6 UJ	38.8 J	13.4 J
Pesticide/Polychlorinated Biphenyls (UG/KG)													
4,4'-DDD	--	2,000	583	35.6 J	3.7 U	4.7 U	44 U	NA	NA	NA	1 UJ	1.4 J	1.7 J
4,4'-DDE	--	1,400	114	86	3.7 U	2.3 J	8.9	NA	NA	NA	0.54 UJ	14 J	16 J
4,4'-DDT	--	1,700	100	352	3.7 U	4.7 UJ	44 U	NA	NA	NA	0.76 UJ	7 J	5.9 J
Aroclor-1254	--	110	8,000	19 U	18 U	24 U	61.3	98	16 U	16 U	19 UJ	42 NJ	**120 J**
Polychlorinated biphenyls (PCBs)	--	220	--	39 U	37 U	47 U	61.3	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)													
No Detections	--	--	--	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)													
Aluminum	11,000	7,700	--	8,030	**16,200**	4,010	**16,000**	NA	NA	NA	2,120 J	5,400 J	5,610 J
Antimony	2.3	3.1	78	2.1 J	1.3 J	17 U	1.2 J	NA	NA	NA	0.456 UJ	0.484 UJ	0.452 UJ
Arsenic	2.5	0.39	18	1.8	0.48 J	1.7 J	0.69	NA	NA	NA	1.2 J	1.2 J	0.96 J
Barium	24	1500	330	**31.8**	**48.9**	17.6	**58.7**	NA	NA	NA	10.3 J	**49.8 J**	**48.6 J**
Beryllium	0.45	16	40	0.13 J	0.3	0.35 U	0.32 J	NA	NA	NA	2.85 UJ	2.59 UJ	2.94 UJ
Cadmium	0.04	7	32	**0.79**	0.42 U	**0.12 J**	**0.31**	NA	NA	NA	**0.775 J**	**0.5 J**	0.918 UJ
Calcium	210,000	--	--	84,500	4,180	124,000	12,500	NA	NA	NA	105,000 J	107,000 J	99,200 J
Chromium	48	--	64	16.3	24.6	6.7	23.7	NA	NA	NA	3.3 J	6.5 J	6.6 J
Chromium (hexavalent)	--	0.29	--	NA	NA	NA	NA	NA	NA	NA	1.84 J	1.74 J	2.38 J
Cobalt	13	2.3	13	6.7	**16.5**	2.2 J	**16.2**	NA	NA	NA	0.925 J	3.4 J	4.05 J
Copper	35	310	70	**69.9**	**51.6**	25.1	**65.7**	NA	NA	NA	5.08 J	**57.6 J**	**72 J**
Iron	18,000	5500	--	17,100	**32,200**	6,860	**26,700**	NA	NA	NA	3,310 J	11,200 J	11,900 J
Lead	6.9	400	120	**145**	4 J	**62.1**	**47.7**	NA	NA	NA	6.8 J	**12.1 J**	**12.7 J**
Magnesium	12,834	--	--	5,990	11,500	3,080	9,850	NA	NA	NA	3,110 J	5,280 J	5,380 J
Manganese	360	180	220	**426**	**911**	75.6	**961**	NA	NA	NA	89.4 J	229 J	247 J
Mercury	0.016	2.3	0.1	**0.035 J**	0.093 U	**0.02 J**	**0.027 J**	NA	NA	NA	0.00742 J	0.00897 J	0.0106 J
Nickel	26	150	38	10.7	16.6	4.7	18.1	NA	NA	NA	2.85 UJ	3.03 J	3.56 J
Potassium	1,700	--	--	1,550	640	1,500	**2,800**	NA	NA	NA	699 J	847 J	874 J
Selenium	0.68	39	0.52	**2.4 J**	11 U	**4.4 J**	6.5 U	NA	NA	NA	0.47 UJ	0.54 UJ	0.43 UJ
Silver	0.084	39	560	**0.27 J**	0.53 U	0.69 U	0.084 J	NA	NA	NA	0.304 UJ	0.322 UJ	0.301 UJ
Sodium	6,300	--	--	**8,430**	3,110	**9,180**	**7,070**	NA	NA	NA	**10,900 J**	5,390 J	5,020 J
Vanadium	63	39	130	29	**108**	13.8	**82.3**	NA	NA	NA	9.58 J	32.7 J	35 J
Zinc	31	2,300	120	**126 J**	**51.5 J**	**56.7 J**	**127 J**	NA	NA	NA	11 J	**56.9 J**	**58 J**
Total Petroleum Hydrocarbons (UG/KG)													
TPH-diesel range	--	--	--	5,830 J	37,200	12,000 U	11,000 U	NA	NA	NA	NA	NA	NA
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)													
Acid volatile sulfide	--	--	--	NA	NA	NA	NA	NA	NA	NA	1.8	0.01 U	NA
Cadmium, SEM	--	--	--	NA	NA	NA	NA	NA	NA	NA	0.0014 U	2.30E-04 J	NA
Copper, SEM	--	--	--	NA	NA	NA	NA	NA	NA	NA	0.013 J	0.28	NA
Lead, SEM	--	--	--	NA	NA	NA	NA	NA	NA	NA	0.02	0.03	NA
Mercury, SEM	--	--	--	NA	NA	NA	NA	NA	NA	NA	3.00E-05 U	2.70E-05 U	NA
Nickel, SEM	--	--	--	NA	NA	NA	NA	NA	NA	NA	0.0029 J	0.008 J	NA
Zinc, SEM	--	--	--	NA	NA	NA	NA	NA	NA	NA	0.16	0.31	NA
Wet Chemistry													
Ammonia (mg/kg)	--	--	--	NA	NA	NA	NA	NA	NA	NA	27.2	37.7	36.8
pH (ph)	--	--	--	NA	NA	NA	NA	NA	NA	NA	8.11	8.05	NA
Redox (MV) (mv)	--	--	--	NA	NA	NA	NA	NA	NA	NA	532	538	NA
Sulfide (mg/kg)	--	--	--	NA	NA	NA	NA	NA	NA	NA	19	33	NA
Total organic carbon (TOC) (mg/kg)	--	--	--	NA	NA	NA	NA	NA	NA	NA	7,500	8,500	NA

Notes:

Exceeds Vieques (West) Background Zone Qs

Exceeds Vieques (West) Background Zone Qs and Adjusted RSL for Residential Soil

Exceeds Vieques (West) Background Zone Qs and ESVs Soil

Exceeds Vieques (West) Background Zone Qs, Adjusted RSL for Residential Soil and ESVs Soil

NA - Not analyzed
ND - Not detected
J - Analyte present, value may or may not be accurate or precise
U - Not detected at significantly greater than that in an associated blank
UJ - Analyte not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
UG/KG - Micrograms per kilogram

[1] Samples screened only against Background and Adjusted RSL for Residential Soil because these samples were evaluated as sediment in the ERA because they occur within the interidal zone; thus, soil ESVs do not apply
* Samples were not screened against ESVs for Soil, therefore PAH HMW and PAH LMW values are not necessary
Vieques Soil ESVs – source of soil ecological screening values is the ERA protocol (CH2M HILL, 2010b; 2010c)

TABLE 2-2
Post-Removal Sediment Detection and Exceedance Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

						Site											
Station ID	**CLEAN Vieques (West) Background for SWMU 6 Kiani & El Pobre**	**CLEAN Vieques (West) Background for SWMU 6 Punta Arenas Max**	**CLEAN Vieques (West) Background for SWMU 6 UTL SD**	**Nov 2011 RSL Residential Soil Adjusted**	**Eco Marine - Sediment**	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008[1]	VWW06-SD009	VWW06-SD010	VWW06-SS012[1]
Sample ID						VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211	VWW06-SS012-0211
Sample Date						02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/07/11
Chemical Name																	
Volatile Organic Compounds (UG/KG)																	
2-Butanone	--	--	--	2,800,000	--	30.5 J	28.5 J	23.9 J	4.4 UJ	19.5	13.4 J	7.2 J	5.6 J	2.9 U	47.3 J	13.9 J	NA
Acetone	--	--	--	6,100,000	--	207 J	104 J	80.7 J	29.6 J	86.9	49.8 J	4.3 UJ	112 J	2.7 U	158 J	70	NA
Carbon disulfide	--	--	--	82,000	--	17 J	9.5 J	4 J	3.1 UJ	3 U	3.4 J	3.3 U	4.4 UJ	2.1 U	13 J	2.8 U	NA
Tetrachloroethene	--	--	--	8,600	57	12 J	10.3 J	2.8 J	2.2 J	1.8 J	2.4 J	3.1 U	4.1 UJ	2 J	6.5 UJ	1.6 J	NA
Semivolatile Organic Compounds (UG/KG)																	
Acenaphthene	--	--	--	340,000	16	9 UJ	66.8 UJ	20.4 U	11.9 J	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ	NA
Acenaphthylene	--	--	--	--	44	9 UJ	66.8 UJ	20.4 U	19.6 U	17 UJ	18 UJ	20 J	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ	NA
Anthracene	--	--	--	1,700,000	85.3	9.9 J	66.8 UJ	20.4 U	28.2	17 UJ	9.4 J	18.8 J	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ	NA
Benzo(a)anthracene	--	--	--	150	261	10.1 J	70.3 UJ	39.7	66.7	22.6 J	59.9 J	102 J	4.7 J	2.7 UJ	63.2 J	20.2 J	NA
Benzo(a)pyrene	--	--	--	15	430	11.2 UJ	83.6 UJ	**77.8 J**	**65.1**	**24.5 J**	**62.5 J**	**110 J**	6.7 J	3.3 UJ	**96.7 J**	**25.2 J**	NA
Benzo(b)fluoranthene	--	--	--	150	1,800	11.2 UJ	83.6 UJ	124 J	87.4	40.5 J	96.1 J	**160 J**	10.7 J	3.3 UJ	**155 J**	36.1 J	NA
Benzo(g,h,i)perylene	--	--	--	--	670	11.2 UJ	83.6 UJ	60 J	38.8	21.3 UJ	32.1 J	62.2 J	5.1 UJ	3.3 UJ	58.8 J	21.3 UJ	NA
Benzo(k)fluoranthene	--	--	--	1,500	1,800	11.2 UJ	83.6 UJ	39.8 J	31.5	16.2 J	37.8 J	63.4 J	4.2 J	3.3 UJ	59.7 J	15.1 J	NA
Chrysene	--	--	--	15,000	384	6.2 J	65.3 UJ	49.5	63.1	21.1 J	54.1 J	92.4 J	6.8 J	2.5 UJ	86.3 J	18.2 J	NA
Fluoranthene	--	--	--	230,000	600	14.8 J	66.8 UJ	49 J	91.7	29.5 J	72.9 J	122 J	8.5 J	2.6 UJ	92.6 J	25.2 J	NA
Fluorene	--	--	--	230,000	19	9 UJ	66.8 UJ	20.4 U	11.6 J	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ	NA
Indeno(1,2,3-cd)pyrene	--	--	--	150	600	11.2 UJ	83.6 UJ	50.5 J	34.9	21.3 UJ	33.7 J	61.4 J	5.1 UJ	3.3 UJ	55.5 J	21.3 UJ	NA
Phenanthrene	--	--	--	--	240	4.6 J	66.8 UJ	27	111	9.1 J	9.8 J	36.4 UJ	4.1 UJ	2.6 UJ	26 J	8.7 J	NA
Pyrene	--	--	--	170,000	665	10 J	66.8 UJ	67.4	125	31.9 J	63.6 J	106 J	7.3 J	2.6 UJ	108 J	32.8 J	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)																	
4,4'-DDD	--	--	--	2,000	1.22	2.6 UJ	**1.5 J**	**59 J**	**14 J**	**4.6 J**	2.7 UJ	**2.8 J**	3.2 UJ	1 UJ	**34 J**	**5.4 J**	NA
4,4'-DDE	--	1.3	--	1,400	2.2	1.4 UJ	1.1 J	**94 J**	**28 J**	**9.7 J**	**2.9 J**	**5.9 J**	1.7 UJ	0.54 UJ	**66 J**	**7.5 J**	NA
4,4'-DDT	--	--	--	1,700	1.19	2 UJ	1.5 UJ	**3.2 J**	2.3 U	2 UJ	2 UJ	2.1 UJ	2.4 UJ	0.76 UJ	3.7 UJ	2 UJ	NA
Aroclor-1254	--	--	--	110	63.3	49 UJ	37 UJ	29 U	**160**	32 J	25 UJ	30 J	30 UJ	19 UJ	**260 J**	48 J	**98**
Total Metals (MG/KG)																	
Aluminum	29,200	10,600	35,000	7,700	18,000	14,500 J	12,600 J	8,980 J	7,820 J	10,700 J	7,030 J	5,720 J	5,460 J	2,120 J	14,400 J	6,030 J	NA
Antimony	--	--	--	3.1	2	1.1 UJ	0.924 UJ	**3.19 J**	1.12 J	0.631 UJ	**3.88 J**	**3.04 J**	0.717 UJ	0.456 UJ	**2.2 J**	0.396 J	NA
Arsenic	6.2	2.1	28.8	0.39	8.2	4 J	5.8 J	3.9	2.4	2.2 J	4 J	4.8 J	1.2 J	1.2 J	7.8 J	4.4 J	NA
Barium	19.8	11.3	20.5	1,500	48	12.2 J	10.7 J	**25.8**	15.1	18.5 J	13.3 J	9.73 J	7.39 J	10.3 J	**33.8 J**	14.8 J	NA
Beryllium	0.648	--	0.718	16	--	0.733 UJ	0.337 J	3.27 U	3.16 U	2.76 UJ	2.88 UJ	3.23 UJ	3.55 UJ	2.85 UJ	5.01 UJ	2.73 UJ	NA
Cadmium	--	0.175	--	7	1.2	**0.302 J**	0.192 UJ	**1.98 J**	**1.75 J**	**4.14 J**	**1.65 J**	**1 J**	**0.903 J**	**0.775 J**	**5.69 J**	**1.62 J**	NA
Calcium	53,000	30,900	66,700	--	--	**101,000 J**	48,000 J	**114,000**	**94,400**	**87,100 J**	**140,000 J**	**106,000 J**	**93,800 J**	**105,000 J**	**72,900 J**	**110,000 J**	NA
Chromium	15.1	20	21.9	--	81	13.6 J	13.8 J	16.7	12.2	12.5 J	14.3 J	14.2 J	5.9 J	3.3 J	**37 J**	19.3 J	NA
Chromium (hexavalent)	36.8	150	219	0.29	--	38.6 J	36.9 J	5.28	0.891 U	0.836 UJ	0.988 J	2.99 J	6.43 J	1.84 J	12 J	1.92 J	NA
Cobalt	8.48	4.47	9.37	2.3	10	4.95 J	5.82 J	5.14	4.13 J	7.89 J	3.1 J	3.12 J	1.77 J	0.925 J	9 J	3.81 J	NA
Copper	47.6	37.1	54.1	310	34	27.5 J	37.4 J	**138 J**	**73.4 J**	**71.5 J**	54.1 J	46.7 J	13.6 J	5.08 J	**204 J**	**56.9 J**	NA
Iron	35,300	14,400	43,900	5,500	220,000	17,400 J	21,400 J	26,700	18,800	26,400 J	17,100 J	16,500 J	6,750 J	3,310 J	**45,900 J**	18,600 J	NA
Lead	12.6	7.08	15.1	400	46.7	6.7 J	**25.8 J**	**442**	**185**	**157 J**	**93 J**	**79.3 J**	11.8 J	6.8 J	**612 J**	**134 J**	NA
Magnesium	10,300	15,800	17,500	--	--	10,900 J	9,290 J	6,430 J	5,390 J	7,660 J	7,720 J	4,390 J	3,580 J	3,110 J	11,900 J	4,100 J	NA
Manganese	359	196	455	180	260	187 J	219 J	294	245	266 J	123 J	116 J	60.1 J	89.4 J	356 J	164 J	NA
Mercury	0.0985	0.131	0.138	0.78	0.15	0.039 J	0.104 J	0.088	0.0642	0.0446 J	0.0288 J	0.0336 J	0.0205 J	0.00742 J	0.129 J	0.0554 J	NA
Nickel	8.6	7.3	9.68	150	20.9	5.94 J	6.92 J	**10.2 J**	6.41 J	**11.4 J**	8.36 J	5.54 J	3.55 UJ	2.85 UJ	**19.1 J**	6.66 J	NA
Potassium	5,360	4,190	6,090	--	--	3,910 J	3,320 J	1,760	1,700	1,940 J	1,360 J	1,210 J	1,380 J	699 J	3,450 J	1,170 J	NA
Selenium	4.4	--	4.34	39	1	1.5 UJ	1.5 UJ	0.93 U	0.92 U	0.61 UJ	0.62 UJ	0.63 UJ	0.84 UJ	0.47 UJ	1.4 UJ	0.57 UJ	NA
Silver	--	--	--	39	1	0.733 UJ	0.616 UJ	0.295 J	0.246 J	0.42 UJ	0.406 UJ	0.492 UJ	0.478 UJ	0.304 UJ	0.787 UJ	0.368 UJ	NA
Sodium	40,600	74,700	96,400	--	--	44,900 J	32,900 J	12,600 J	12,600 J	9,270 J	10,300 J	9,700 J	12,400 J	10,900 J	27,800 J	8,010 J	NA
Thallium	1.7	--	1.69	0.078	--	1.56 UJ	1.32 J	6.96 U	6.72 U	**5.17 J**	6.13 UJ	6.86 UJ	7.55 UJ	6.05 UJ	10.6 UJ	5.8 UJ	NA
Vanadium	56.3	58.6	71.7	39	57	40.8 J	43 J	38.6	32.6	59.7 J	26.7 J	21.5 J	17.6 J	9.58 J	66.1 J	29.8 J	NA
Zinc	76	42.2	87.3	2,300	150	39.6 J	64.7 J	**440**	**262**	**237 J**	**206 J**	**162 J**	25.4 J	11 J	**849 J**	**164 J**	NA
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)																	
Acid volatile sulfide	--	--	--	--	--	8.9	7.4	0.17	0.53	0.15	0.38	NA	3.2	1.8	0.029 U	2.7	NA
Cadmium, SEM	--	--	--	--	--	0.005 U	7.40E-04 J	0.0072	0.0039	0.016	0.0028	NA	0.0043	0.0014 U	0.0035 U	0.024	NA
Copper, SEM	--	--	--	--	--	0.051 U	0.036 U	0.32	0.17	0.32	0.11	NA	0.12	0.013 J	0.092	0.22	NA
Lead, SEM	--	--	--	--	--	0.026	0.081	1.3	0.43	0.54	0.24	NA	0.34	0.02	0.067	1.3	NA
Mercury, SEM	--	--	--	--	--	1.10E-04 U	7.50E-05 U	1.40E-05 J	4.60E-05 U	4.10E-05 U	3.90E-05 U	NA	4.80E-05 U	3.00E-05 U	7.60E-05 U	4.00E-05 U	NA
Nickel, SEM	--	--	--	--	--	0.013 J	0.012 J	0.044	0.022 J	0.032 J	0.023 J	NA	0.024 J	0.0029 J	0.0097 J	0.048	NA
Zinc, SEM	--	--	--	--	--	0.31	0.48	3.8	1.4	2	1.6	NA	3.1	0.16	0.35	5.1	NA
Wet Chemistry																	
Ammonia (mg/kg)	--	--	--	--	--	351	167	60.6	62.5	53.1	41.5	NA	60.3	27.2	141	40.4	NA
pH (ph)	--	--	--	--	--	7.4	7.65	7.75	7.8	7.85	7.76	NA	7.45	8.11	7.83	7.82	NA
Redox (MV) (mv)	--	--	--	--	--	-1.81E+02	-1.30E+02	543	541	544	546	NA	526	532	536	538	NA
Sulfide (mg/kg)	--	--	--	--	--	140	170	99	130	160	130	NA	70	19	54	89	NA
Total organic carbon (TOC) (mg/kg)	--	--	--	--	--	35,000 J	45,000 J	18,000 J	16,000 J	13,000 J	16,000 J	NA	13,000 J	7,500	24,000 J	6,700	NA

Notes:

Exceeds All Background

Exceeds All Background and Adjusted RSL for Residential Soil

Exceeds All Background and Eco Marine - Sediment

Exceeds All Background, Adjusted RSL for Residential Soil and Eco Marine - Sediment

NA - Not analyzed
J - Analyte present, value may or may not be accurate or precise
NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity
U - Not detected or not detected at significantly greater than that in an associated blank
UJ - Analyte not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
MV - Millivolts
PH - pH units
UG/KG - Micrograms per kilogram
UMOL/G - Micromoles per gram
[1] Samples screened only against Background and Eco Marine - Sediment criteria
Eco Marine - Sediment – source of sediment ecological screening values is the ERA protocol (CH2M HILL, 2010b; 2010c)

TABLE 2-2
Post-Removal Sediment Detection and Exceedance Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

						Site (continued)		Background										
Station ID	**CLEAN Vieques (West) Background for SWMU 6 Kiani & El Pobre**	**CLEAN Vieques (West) Background for SWMU 6 Punta Arenas Max**	**CLEAN Vieques (West) Background for SWMU 6 UTL SD**	**Nov 2011 RSL Residential Soil Adjusted**	**Eco Marine - Sediment**	VWW06-SS013[1]		VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022	VWW06-SD023	
Sample ID						VWW06-SS013-0211	VWW06-SS013P-0211	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211	VWW06-SD023-0211	VWW06-SD023P-0211
Sample Date						02/07/11	02/07/11	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name																		
Volatile Organic Compounds (UG/KG)																		
2-Butanone	--	--	--	2,800,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	--	--	--	6,100,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	--	--	--	82,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	--	--	--	8,600	57	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/KG)																		
Acenaphthene	--	--	--	340,000	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	--	--	--	--	44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	--	--	--	1,700,000	85.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	--	--	--	150	261	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	--	--	--	15	430	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	--	--	--	150	1,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	--	--	--	--	670	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	--	--	--	1,500	1,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	--	--	--	15,000	384	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	--	--	--	230,000	600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	--	--	--	230,000	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	--	--	--	150	600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	--	--	--	--	240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	--	--	--	170,000	665	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)																		
4,4'-DDD	--	--	--	2,000	1.22	NA	NA	3.4 UJ	2.2 UJ	3.1 UJ	3.8 UJ	3.9 UJ	3.9 UJ	4.1 UJ	4.2 UJ	4.5 UJ	3.6 UJ	3.5 UJ
4,4'-DDE	--	1.3	--	1,400	2.2	NA	NA	1.3 J	1.1 UJ	1.6 UJ	2 UJ	2.1 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.4 UJ	1.9 UJ	1.8 UJ
4,4'-DDT	--	--	--	1,700	1.19	NA	NA	2.6 UJ	1.6 UJ	2.3 UJ	2.8 UJ	2.9 UJ	2.9 UJ	3 UJ	3.1 UJ	3.4 UJ	2.6 UJ	2.6 UJ
Aroclor-1254	--	--	--	110	63.3	16 U	16 U	64 UJ	40 UJ	58 UJ	70 UJ	44 UJ	44 UJ	46 UJ	47 UJ	51 UJ	40 UJ	39 UJ
Total Metals (MG/KG)																		
Aluminum	29,200	10,600	35,000	7,700	18,000	NA	NA	8,470 J	9,890 J	7,980 J	10,600 J	27,000 J	24,500 J	29,200 J	16,200 J	14,000 J	16,900 J	16,600 J
Antimony	--	--	--	3.1	2	NA	NA	1.33 UJ	0.89 UJ	1.35 UJ	1.51 UJ	1.01 UJ	1.17 UJ	1.03 UJ	1.02 UJ	1.09 UJ	0.974 UJ	0.835 UJ
Arsenic	6.2	2.1	28.8	0.39	8.2	NA	NA	2.5 UJ	2 J	1.4 UJ	2.1 J	5.9 J	5.5 J	2.6 J	6 J	6.2 J	3.1 J	2.8 J
Barium	19.8	11.3	20.5	1,500	48	NA	NA	8.21 J	7.11 J	9.6 J	11.3 J	14.8 J	14 J	19.8 J	11.6 J	9.56 J	12 J	11.3 J
Beryllium	0.648	--	0.718	16	--	NA	NA	0.89 UJ	0.593 UJ	0.902 UJ	1 UJ	0.648 J	0.478 J	0.612 J	0.678 UJ	0.38 J	0.395 J	0.339 J
Cadmium	--	0.175	--	7	1.2	NA	NA	0.175 J	0.185 UJ	0.282 UJ	0.314 UJ	0.211 UJ	0.244 UJ	0.214 UJ	0.212 UJ	0.227 UJ	0.203 UJ	0.174 UJ
Calcium	53,000	30,900	66,700	--	--	NA	NA	30,900 J	14,000 J	17,600 J	11,400 J	6,260 J	8,510 J	4,750 J	53,000 J	14,200 J	25,400 J	25,400 J
Chromium	15.1	20	21.9	--	81	NA	NA	10.9 J	20 J	10.3 J	6.7 J	14.9 J	13.7 J	15 J	14.1 J	14.8 J	15 J	15.1 J
Chromium (hexavalent)	36.8	150	219	0.29	--	NA	NA	24.8 J	150 J	30.5 J	101 J	33.9 J	36.8 J	34.1 J	24.6 J	9.34 J	30.4 J	3.63 J
Cobalt	8.48	4.47	9.37	2.3	10	NA	NA	3.81 J	3.94 J	3.3 J	4.47 J	8.48 J	7.33 J	7.01 J	5.03 J	5.08 J	5.26 J	5.18 J
Copper	47.6	37.1	54.1	310	34	NA	NA	29.7 J	23.4 J	37.1 J	28.5 J	44.6 J	42.4 J	47.6 J	32.1 J	32.5 J	39.6 J	37.4 J
Iron	35,300	14,400	43,900	5,500	220,000	NA	NA	10,400 J	9,300 J	14,400 J	8,870 J	35,300 J	34,000 J	29,400 J	19,600 J	20,000 J	23,500 J	22,800 J
Lead	12.6	7.08	15.1	400	46.7	NA	NA	3.94 J	4.64 J	6.38 J	7.08 J	12.6 J	11.3 J	12.2 J	6.18 J	6.06 J	6.94 J	6.35 J
Magnesium	10,300	15,800	17,500	--	--	NA	NA	13,000 J	9,920 J	11,000 J	15,800 J	9,660 J	9,420 J	8,880 J	9,550 J	10,300 J	9,390 J	8,700 J
Manganese	359	196	455	180	260	NA	NA	159 J	115 J	196 J	63 J	359 J	341 J	334 J	174 J	191 J	250 J	248 J
Mercury	0.0985	0.131	0.138	0.78	0.15	NA	NA	0.0988 J	0.0669 J	0.131 J	0.0771 J	0.0985 J	0.0858 J	0.0707 J	0.043 J	0.0611 J	0.0754 J	0.0676 J
Nickel	8.6	7.3	9.68	150	20.9	NA	NA	7.15 J	7.3 J	5.8 J	5.16 J	8.43 J	7.88 J	8.6 J	7.1 J	6.79 J	7.44 J	7.15 J
Potassium	5,360	4,190	6,090	--	--	NA	NA	3,720 J	2,750 J	3,260 J	4,190 J	5,360 J	4,860 J	5,290 J	3,860 J	3,750 J	3,910 J	3,490 J
Selenium	4.4	--	4.34	39	1	NA	NA	2.5 UJ	1.1 UJ	1.4 UJ	2.1 UJ	1.6 UJ	1.4 J	1.9 J	4.4 J	2.6 J	1.6 J	1.5 J
Silver	--	--	--	39	1	NA	NA	0.89 UJ	0.593 UJ	0.902 UJ	1 UJ	0.674 UJ	0.78 UJ	0.684 UJ	0.678 UJ	0.726 UJ	0.649 UJ	0.557 UJ
Sodium	40,600	74,700	96,400	--	--	NA	NA	62,000 J	39,400 J	56,700 J	74,700 J	36,300 J	37,000 J	30,800 J	37,700 J	40,600 J	32,200 J	28,800 J
Thallium	1.7	--	1.69	0.078	--	NA	NA	1.89 UJ	1.26 UJ	1.92 UJ	2.14 UJ	1.43 UJ	1.7 J	1.45 UJ	1.44 UJ	1.54 UJ	1.24 J	0.707 J
Vanadium	56.3	58.6	71.7	39	57	NA	NA	29.4 J	42.4 J	20.7 J	58.6 J	54.7 J	46.8 J	56.3 J	44.5 J	43.7 J	33.6 J	35.2 J
Zinc	76	42.2	87.3	2,300	150	NA	NA	40.4 J	42.2 J	31.9 J	34.9 J	76 J	70.9 J	67.8 J	43.1 J	43.4 J	51.4 J	49.6 J
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)																		
Acid volatile sulfide	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium, SEM	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, SEM	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead, SEM	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury, SEM	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, SEM	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc, SEM	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																		
Ammonia (mg/kg)	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH (ph)	--	--	--	--	--	NA	NA	7.22	7.17	7.26	7.07	7.3	7.25	7.05	7.52	7.3	7.23	6.96
Redox (MV) (mv)	--	--	--	--	--	NA	NA	-1.58E+02	-1.48E+02	-1.52E+02	-1.56E+02	-1.21E+02	-1.25E+02	-1.54E+02	-1.19E+02	-1.05E+02	-1.54E+02	-1.51E+02
Sulfide (mg/kg)	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC) (mg/kg)	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Exceeds All Background

Exceeds All Background and Adjusted RSL for Residential Soil

Exceeds All Background and Eco Marine - Sediment

Exceeds All Background, Adjusted RSL for Residential Soil and Eco Marine - Sediment

NA - Not analyzed
J - Analyte present, value may or may not be accurate or precise
NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity
U - Not detected or not detected at significantly greater than that in an associated blank
UJ - Analyte not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
MV - Millivolts
PH - pH units
UG/KG - Micrograms per kilogram
UMOL/G - Micromoles per gram
[1] Samples screened only against Background and Eco Marine - Sediment criteria
Eco Marine - Sediment – source of sediment ecological screening values is the ERA protocol (CH2M HILL, 2010b; 2010c)

TABLE 2-3
Post-Removal Suface Water Detection and Exceedance Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

						Site								Background	
Station ID	**CLEAN Vieques (West) Background for SWMU 6 Kiani & El Pobre**	**CLEAN Vieques (West) Background for SWMU 6 Punta Arenas Max**	**CLEAN Vieques (West) Background for SWMU 6 UTL SW**	**Nov 2011 RSL Tapwater Adjusted**	**Eco Marine - Surface Water**	VWW06-SW001	VWW06-SW002	VWW06-SW003	VWW06-SW004	VWW06-SW005	VWW06-SW006	VWW06-SW007		VWW06-SW014	VWW06-SW015
Sample ID						VWW06-SW001-0211	VWW06-SW002-0211	VWW06-SW003-0211	VWW06-SW004-0211	VWW06-SW005-0211	VWW06-SW006-0211	VWW06-SW007-0211	VWW06-SW007P-0211	VWW06-SW014-0211	VWW06-SW015-0211
Sample Date						02/07/11	02/07/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/07/11	02/07/11
Chemical Name															
Volatile Organic Compounds (UG/L)															
No Detections	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Semivolatile Organic Compounds (UG/L)															
2-Methylnaphthalene	--	--	--	2.7	--	0.042 U	0.023 J	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U	NA	NA
Fluorene	--	--	--	22	--	0.042 U	0.042 U	0.041 U	0.041 U	0.043 J	0.047 J	0.055 J	0.041 UJ	NA	NA
Phenanthrene	--	--	--	--	8.3	0.042 U	0.023 J	0.051 U	0.059 U	0.064	0.069	0.079 J	0.047 UJ	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)															
4,4'-DDD	0.048	--	--	0.28	0.001	0.0054 U	0.0053 U	0.0054 U	0.0054 U	0.0053 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0055 U
4,4'-DDE	0.067	--	--	0.2	0.001	0.0079 U	0.0078 U	0.0079 U	0.0078 U	0.0078 U	0.0079 U	0.0078 U	0.0079 U	0.0079 U	0.008 U
4,4'-DDT	0.083	--	--	0.2	0.001	0.0023 U	0.0022 U	0.0023 U	0.0023 U	0.0022 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U
Aldrin	0.0046	--	--	0.004	0.13	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0034 U
alpha-Chlordane	0.045	--	--	0.19	0.004	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0063 U
beta-BHC	0.025	--	--	0.037	25	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
delta-BHC	0.012	--	--	0.037	25	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0063 U
Dieldrin	0.047	--	--	0.0042	0.11	0.0056 U	0.0055 U	0.0056 U	0.0056 U	0.0055 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0057 U
Endosulfan I	0.049	--	--	22	0.087	0.0089 U	0.0088 U	0.0089 U	0.0089 U	0.0088 U	0.0089 U	0.0089 U	0.009 U	0.009 U	0.009 U
Endosulfan II	0.04	--	--	22	0.087	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0034 U
Endosulfan sulfate	0.026	--	--	22	0.087	0.0021 U	0.002 U	0.0021 U	0.0021 U	0.002 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U
Endrin	0.053	--	--	1.1	0.01	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0038 U	0.0038 U	0.0038 U
Endrin aldehyde	0.0053	--	--	1.1	0.01	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0032 U
Endrin ketone	0.029	--	--	1.1	0.01	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U
gamma-Chlordane	0.026	--	--	0.19	0.004	0.005 U	0.0049 U	0.005 U	0.0049 U	0.0049 U	0.005 U	0.0049 U	0.005 U	0.005 U	0.005 U
Heptachlor	0.0074	--	--	0.0018	0.0036	0.0082 U	0.0081 U	0.0082 U	0.0082 U	0.0081 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0083 U
Heptachlor epoxide	0.038	--	--	0.0074	0.0036	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U
Methoxychlor	0.061	--	--	2.7	0.03	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0038 U	0.0038 U	0.0038 U
Total Metals (UG/L)															
Aluminum	--	428	--	1600	--	316 J	**446 J**	1,630 R	875 R	698 R	559 R	372 R	372 R	186 U	186 U
Antimony	72.7	--	65.8	0.6	4,300	20 U	66 U	10.3 J	100 U	20 U	100 U	100 U	100 U	66 U	20 U
Barium	13	33.9	33.9	290	200	8.09 J	9.36 J	7.06 J	16.1 J	13.7 J	7.67 J	5.74 J	5.42 J	33.4 J	29.6 J
Cadmium	11	11.4	12.5	0.69	8.85	9.86 J	11 J	10 U	**15.9 J**	20 U	28.8 U	28.8 U	28.8 U	20 U	14.4 U
Calcium	427,000	539,000	539,000	--	--	393,000	392,000	419,000 J	523,000 J	489,000 J	498,000 J	462,000 J	464,000 J	519,000	503,000
Chromium (hexavalent)	47	97	99	0.031	50.4	7 U	7 UJ	35 J	21 J	41 J	12 J	12 J	22 J	53	44 J
Copper	46.2	149	152	62	3.73	104 J	98.9 J	25 U	108 U	108 U	108 U	108 U	108 U	50 U	98.6 J
Iron	1,660	201	5,270	1,100	50	110 U	118 J	392 J	813 J	590 J	220 U	220 U	220 U	110 U	110 U
Lead	--	--	--	15	8.52	20 U	**39.4 J**	10 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium	1,320,000	1,620,000	162,000	--	--	1,200,000	1,220,000	1,310,000 J	1,360,000 J	1,180,000 J	1,360,000 J	1,260,000 J	1,160,000 J	1,570,000	1,550,000
Mercury	0.0426	0.0516	0.0548	0.43	0.051	0.0401 J	0.074 UJ	0.0411 J	0.074 UJ	0.074 UJ	0.074 UJ	0.074 UJ	0.074 UJ	0.0514 J	0.0516 J
Potassium	437,000	533,000	533,000	--	--	417,000	415,000	433,000	**544,000**	510,000	512,000	476,000	480,000	533,000	514,000
Selenium	103	113	126	7.8	71.1	70.1 J	74.2 J	164 UJ	164 UJ	164 UJ	164 UJ	164 UJ	164 UJ	113	102
Sodium	11,200,000	13,800,000	138,000	--	--	10,500,000	10,500,000	11,100,000	**15,900,000**	11,500,000	11,300,000	10,600,000	10,800,000	13,600,000	13,600,000
Thallium	--	--	--	0.016	21.3	88 U	88 U	**121 J**	176 U	176 U	176 U	176 U	176 U	88 U	88 U
Vanadium	7.77	--	7.63	7.8	50	5.3 J	8.8 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	8.8 U	8.8 U
Dissolved Metals (UG/L)															
Aluminum, Dissolved	--	252	242	1,600	--	186 U	186 U	**1,220 J**	**1,740 J**	**387 J**	**1,450 J**	1,230 R	372 R	186 U	186 U
Barium, Dissolved	10.6	28.4	28.4	290	200	6.83 J	7.36 J	7.58 J	19.6 J	15.5 J	8.79 J	6.48 J	5.92 J	26.4 J	26.6 J
Calcium, Dissolved	--	556,000	--	--	--	400,000	400,000	418,000	419,000	484,000	416,000	409,000	465,000	535,000	556,000
Chromium (hexavalent), Dissolved	16	38	39.4	--	50	7 UJ	7 UJ	12 J	13 J	14 J	13 J	9 J	8 J	16 J	19 J
Copper, Dissolved	26	--	--	62	3.1	54 U	54 U	108 U	108 U	108 U	108 U	108 U	108 U	50 U	54 U
Iron, Dissolved	--	--	--	1100	50	**318 J**	110 U	220 U	**293 J**	220 U	220 U	220 U	220 U	110 U	110 U
Lead, Dissolved	11.9	--	--	15	8.1	20 U	20 U	10 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium, Dissolved	--	1,690,000	--	--	--	1,270,000 J	1,260,000 J	1,320,000	1,280,000	1,080,000	1,290,000	1,290,000	1,200,000	1,640,000 J	1,680,000 J
Mercury, Dissolved	0.0454	0.0621	0.0667	0.43	0.94	0.0434 J	0.0475 J	0.074 UJ	0.0439 J	0.0474 J	0.074 UJ	0.074 UJ	0.074 UJ	0.0621 J	0.0551 J
Potassium, Dissolved	--	552,000	--	--	--	408,000	409,000	438,000	436,000	498,000	435,000	428,000	470,000	533,000	550,000
Selenium, Dissolved	121	114	126	7.8	71	82 U	50.5 J	164 U	164 U	164 U	164 U	164 U	164 U	100 J	114 J
Sodium, Dissolved	11,400,000	15,600,000	156,000	--	--	10,400,000	10,300,000	11,000,000 J	10,800,000 J	11,000,000 J	10,700,000 J	10,900,000 J	10,700,000 J	13,900,000	14,500,000
Vanadium, Dissolved	5.82	5.37	6.25	7.8	50	4.67 J	8.8 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	8.8 U	8.8 U

Notes:

Exceeds All Background

Exceeds All Background and Eco Marine - Surface Water

Exceeds All Background, RSL Tap Water Adjusted and Eco Marine - Surface Water

NA - Not analyzed

ND - Not detected

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

R - Unreliable Result

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/L - Milligrams per liter

UG/L - Micrograms per liter

Eco Marine - Surface Water – source of surface water ecological screening values is the ERA protocol (CH2M HILL, 2010b, 2010c)

TABLE 2-3
Post-Removal Suface Water Detection and Exceedance Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	CLEAN Vieques (West) Background for SWMU 6 Kiani & El Pobre	CLEAN Vieques (West) Background for SWMU 6 Punta Arenas Max	CLEAN Vieques (West) Background for SWMU 6 UTL SW	Nov 2011 RSL Tapwater Adjusted	Eco Marine - Surface Water	Background (continued)								
						VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021	VWW06-SW022	VWW06-SW023	
Sample ID						VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Sample Date						02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name														
Volatile Organic Compounds (UG/L)														
No Detections	--	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/L)														
2-Methylnaphthalene	--	--	--	2.7	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	--	--	--	22	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	--	--	--	--	8.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)														
4,4'-DDD	0.048	--	--	0.28	0.001	0.0055 U	0.0054 U	0.048 J	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U
4,4'-DDE	0.067	--	--	0.2	0.001	0.0081 U	0.0079 U	0.067	0.0079 U	0.0078 U	0.0079 U	0.0078 U	0.0079 U	0.0079 U
4,4'-DDT	0.083	--	--	0.2	0.001	0.0023 U	0.0023 U	0.083	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U
Aldrin	0.0046	--	--	0.004	0.13	0.0034 U	0.0033 U	0.0046 NJ	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
alpha-Chlordane	0.045	--	--	0.19	0.004	0.0064 U	0.0062 U	0.045 J	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
beta-BHC	0.025	--	--	0.037	25	0.0026 U	0.0025 U	0.025 J	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
delta-BHC	0.012	--	--	0.037	25	0.0064 U	0.0062 U	0.012 J	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Dieldrin	0.047	--	--	0.0042	0.11	0.0057 U	0.0056 U	0.047 J	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Endosulfan I	0.049	--	--	22	0.087	0.0091 U	0.0089 U	0.049 J	0.0089 U	0.0089 U	0.009 U	0.0089 U	0.009 U	0.009 U
Endosulfan II	0.04	--	--	22	0.087	0.0034 U	0.0033 U	0.04 J	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
Endosulfan sulfate	0.026	--	--	22	0.087	0.0021 U	0.0021 U	0.026 J	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U
Endrin	0.053	--	--	1.1	0.01	0.0038 U	0.0037 U	0.053	0.0037 U	0.0037 U	0.0038 U	0.0037 U	0.0038 U	0.0038 U
Endrin aldehyde	0.0053	--	--	1.1	0.01	0.0032 U	0.0031 U	0.0053 J	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U
Endrin ketone	0.029	--	--	1.1	0.01	0.013 U	0.012 U	0.029 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
gamma-Chlordane	0.026	--	--	0.19	0.004	0.0051 U	0.005 U	0.026 J	0.005 U	0.0049 U	0.005 U	0.0049 U	0.005 U	0.005 U
Heptachlor	0.0074	--	--	0.0018	0.0036	0.0084 U	0.0082 U	0.0074 J	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Heptachlor epoxide	0.038	--	--	0.0074	0.0036	0.003 U	0.0029 U	0.038 J	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U
Methoxychlor	0.061	--	--	2.7	0.03	0.0038 U	0.0037 U	0.061	0.0037 U	0.0037 U	0.0038 U	0.0037 U	0.0038 U	0.0038 U
Total Metals (UG/L)														
Aluminum	--	428	--	1600	--	428 J	282 J	1,240 R	2,030 R	800 R	490 R	602 R	640 R	586 R
Antimony	72.7	--	65.8	0.6	4,300	20 U	20 U	36.8 J	20 U	20 U	20 U	20 U	72.7 J	20 U
Barium	13	33.9	33.9	290	200	33.9 J	31.7 J	9.84 J	13 J	10.6 J	8.47 J	10.5 J	10.3 J	9.64 J
Cadmium	11	11.4	12.5	0.69	8.85	9.35 J	11.4 J	14.4 U	8.76 J	9.14 J	9.35 J	11 J	9.5 J	9.58 J
Calcium	427,000	539,000	539,000	--	--	539,000	512,000	421,000	424,000	410,000	427,000	427,000	425,000	425,000
Chromium (hexavalent)	47	97	99	0.031	50.4	43 J	97 J	21	18 J	29 J	8 J	12 J	29 J	47 J
Copper	46.2	149	152	62	3.73	149 J	108 J	46.2 J	45 J	40.7 J	40.7 J	44 J	42 J	37.3 J
Iron	1,660	201	5,270	1,100	50	201 J	110 U	635 J	1,660 J	331 J	110 UJ	176 J	314 J	227 J
Lead	--	--	--	15	8.52	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium	1,320,000	1,620,000	162,000	--	--	1,620,000	1,520,000	1,310,000	1,320,000	1,290,000	1,310,000	1,300,000	1,300,000	1,320,000
Mercury	0.0426	0.0516	0.0548	0.43	0.051	0.074 UJ	0.074 UJ	0.074 U	0.074 U	0.0426 J	0.074 U	0.074 U	0.074 UJ	0.0405 J
Potassium	437,000	533,000	533,000	--	--	533,000	521,000	433,000	437,000	421,000	435,000	436,000	429,000	430,000
Selenium	103	113	126	7.8	71.1	99.6	50.7 J	84.2 J	89.6 J	54.9 J	103	49.3 J	82 U	82 U
Sodium	11,200,000	13,800,000	138,000	--	--	13,800,000	13,200,000	11,000,000	11,200,000	11,100,000	11,000,000	11,000,000	10,800,000	10,800,000
Thallium	--	--	--	0.016	21.3	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U
Vanadium	7.77	--	7.63	7.8	50	8.8 U	8.8 U	5.9 J	7.77 J	4.98 J	8.8 U	8.8 U	8.8 U	5.46 J
Dissolved Metals (UG/L)														
Aluminum, Dissolved	--	252	242	1,600	--	252 J	200 J	186 U	186 U	186 U	186 U	186 U	186 U	186 U
Barium, Dissolved	10.6	28.4	28.4	290	200	28 J	28.4 J	8.65 J	10.2 J	9.74 J	7.76 J	9.8 J	10.6 J	7.41 J
Calcium, Dissolved	--	556,000	--	--	--	553,000	548,000	414,000 R	434,000 R	430,000 R	434,000 R	422,000 R	438,000 R	415,000 R
Chromium (hexavalent), Dissolved	16	38	39.4	--	50	38 J	20 J	15 J	7 J	16 J	7 UJ	4 J	16 J	16 J
Copper, Dissolved	26	--	--	62	3.1	54 U	54 U	50 U	50 U	50 U	54 U	54 U	54 U	26 J
Iron, Dissolved	--	--	--	1100	50	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U
Lead, Dissolved	11.9	--	--	15	8.1	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	11.9 J
Magnesium, Dissolved	--	1,690,000	--	--	--	1,690,000 J	1,690,000 J	1,310,000 R	1,340,000 R	1,360,000 R	1,350,000 R	1,310,000 R	1,350,000 R	1,270,000 R
Mercury, Dissolved	0.0454	0.0621	0.0667	0.43	0.94	0.0469 J	0.053 J	0.074 U	0.074 U	0.074 U	0.074 U	0.0454 J	0.074 UJ	0.074 UJ
Potassium, Dissolved	--	552,000	--	--	--	552,000	539,000	428,000 R	447,000 R	443,000 R	448,000 R	431,000 R	443,000 R	419,000 R
Selenium, Dissolved	121	114	126	7.8	71	82 U	82 U	68.8 J	105	72.8 J	104	96.8	121	65.9 J
Sodium, Dissolved	11,400,000	15,600,000	156,000	--	--	15,600,000	13,700,000	10,900,000	10,900,000	11,300,000	11,100,000	10,900,000	11,400,000	10,500,000
Vanadium, Dissolved	5.82	5.37	6.25	7.8	50	8.8 U	5.37 J	8.8 U	8.8 U	4.94 J	4.5 J	5.82 J	5.78 J	8.8 U

Notes:

Exceeds All Background

Exceeds All Background and Eco Marine - Surface Water

Exceeds All Background, RSL Tap Water Adjusted and Eco Marine - Surface Water

NA - Not analyzed

ND - Not detected

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

R - Unreliable Result

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/L - Milligrams per liter

UG/L - Micrograms per liter

Eco Marine - Surface Water – source of surface water ecological screening values is the ERA protocol (CH2M HILL, 2010b, 2010c)

TABLE 2-4
Post-Removal Biota Detection Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-Background									
Sample ID	VWW06-CRB06-0112	VWW06-CRB07-0112	VWW06-CRB08-0112	VWW06-FS06-0112	VWW06-FS07-0112	VWW06-CRB05-0212	VWW06-CRB05P-0212	VWW06-FS05-0212	VWW06-FS05P-0212	VWW06-FS08-0212
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	02/01/12	02/01/12	02/01/12
Chemical Name										
Polychlorinated Biphenyl Congeners (PG/G)										
2-Chlorobiphenyl (1)	2 U	1.9 U	1.9 U	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	2 U
3-Chlorobiphenyl (2)	2 U	1.9 U	1.9 U	9.5 U	3.9 J	1.9 U	2 U	1.9 U	2 U	1.8 J
4-Chlorobiphenyl (3)	0.98 U	0.95 U	0.97 U	4.8 U	1.3 J	0.97 U	0.99 U	1.1 J	0.98 U	1.3 J
2,2'-Dichlorobiphenyl (4)	9.8 U	9.5 U	9.7 U	48 U	9.6 U	9.7 U	9.9 U	9.7 U	9.8 U	9.9 U
2,3'-Dichlorobiphenyl (6)	9.8 U	9.5 U	9.7 U	48 U	9.6 U	9.7 U	9.9 U	9.7 U	9.8 U	9.9 U
2,4'-Dichlorobiphenyl (8)	3.4 J	6.8 J	5.8 J	48 U	9.6 U	9.7 U	9.9 U	9.7 U	9.8 U	9.9 U
3,3'-Dichlorobiphenyl (11)	14 J	12 J	11 J	48 U	13 J	8.6 J	21	8.2 J	9.8 U	11 J
4,4'-Dichlorobiphenyl (15)	9.8 U	9.5 U	9.7 U	48 U	9.6 U	9.7 U	9.9 U	9.7 U	9.8 U	9.9 U
2,2',3-Trichlorobiphenyl (16)	0.98 U	2.2 J	3 J	4.8 U	0.7 J	0.97 U	0.99 U	0.81 J	0.98 U	0.71 J
2,2',4-Trichlorobiphenyl (17)	0.98 U	6.2 J	5.2 J	4.8 U	0.74 J	0.97 U	0.99 U	1.1 J	0.98 U	0.86 J
2,2',6-Trichlorobiphenyl (19)	0.98 U	2.6 J	2.1 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	1.3 J
2,3,4'-Trichlorobiphenyl (22)	0.98 U	10 J	6.7 J	4.8 U	1.8 J	0.97 U	0.99 U	1.2 J	0.98 U	1.6 J
2,3,5-Trichlorobiphenyl (23)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,6-Trichlorobiphenyl (24)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3',4-Trichlorobiphenyl (25)	0.98 U	4 J	3 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3',6-Trichlorobiphenyl (27)	0.98 U	1.2 J	0.84 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,4',5-Trichlorobiphenyl (31)	1.4 J	35 J	28 J	4.8 U	6.4 J	1.2 J	1.5 J	5 J	2.5 J	7.2 J
2,4',6-Trichlorobiphenyl (32)	0.98 U	12 J	7 J	4.8 U	0.96 U	0.52 J	0.59 J	1.3 J	0.98 U	1.3 J
2,3',5'-Trichlorobiphenyl (34)	0.98 U	0.63 J	0.86 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
3,3',4-Trichlorobiphenyl (35)	2 U	1.9 U	1.9 U	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	2 U
3,3',5-Trichlorobiphenyl (36)	0.98 U	4.1 J	2.4 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.74 J
3,4,4'-Trichlorobiphenyl (37)	0.98 U	5 J	2.4 J	4.8 U	1.1 J	0.97 U	0.99 U	1 J	0.98 U	1.3 J
3,4',5-Trichlorobiphenyl (39)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,4-Tetrachlorobiphenyl (41)	0.98 U	1.5 J	1 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,4'-Tetrachlorobiphenyl (42)	0.98 U	15 J	10 J	4.8 U	0.96 U	0.97 U	0.99 U	0.8 J	0.98 U	2.2 J
2,2',3,5-Tetrachlorobiphenyl (43)	0.98 U	1.9 J	1.3 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,6-Tetrachlorobiphenyl (45)	0.98 U	3.3 J	3.9 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,6'-Tetrachlorobiphenyl (46)	0.98 U	1.6 J	1.6 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',4,5-Tetrachlorobiphenyl (48)	0.98 U	8.5 J	6.3 J	4.8 U	0.76 J	0.97 U	0.99 U	0.97 U	0.98 U	1.5 J
2,2',4,6'-Tetrachlorobiphenyl (51)	1.6 J	9.6 J	3.8 J	4.8 U	1.9 J	1.6 J	1 J	1.5 J	1.6 J	1.5 J
2,2',5,5'-Tetrachlorobiphenyl (52)	5.5 J	440	210	14 J	34	2.8 J	3.8 J	34 J	14 J	68
2,2',6,6'-Tetrachlorobiphenyl (54)	0.98 U	0.57 J	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.66 J
2,3,3',4-Tetrachlorobiphenyl (55)	2 U	1.9 U	1.9 U	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	2 U
2,3,3',4'-Tetrachlorobiphenyl (56)	0.98 U	45	27	4.8 U	4.3 J	0.97 U	0.99 U	2.2 J	0.98 U	5.7 J
2,3,3',5-Tetrachlorobiphenyl (57)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,3',5'-Tetrachlorobiphenyl (58)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,4,4'-Tetrachlorobiphenyl (60)	2 U	24	17 J	9.5 U	3.5 J	1.2 J	2 U	2.1 J	2 U	4.9 J
2,3,4',5-Tetrachlorobiphenyl (63)	0.98 U	8 J	4.7 J	4.8 U	0.98 J	0.97 U	0.99 U	0.97 U	0.98 U	1.2 J
2,3,4',6-Tetrachlorobiphenyl (64)	1 J	55	32	4.8 U	4.8 J	1.3 J	1.2 J	4.5 J	1.9 J	9.3 J
2,3',4,4'-Tetrachlorobiphenyl (66)	4.4 J	190	120	7.7 J	20	6.8 J	8.2 J	12 J	8 J	28
2,3',4,5-Tetrachlorobiphenyl (67)	0.98 U	5.4 J	3.4 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3',4,5'-Tetrachlorobiphenyl (68)	2 U	4 J	2.5 J	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	1.7 J
2,3',5,5'-Tetrachlorobiphenyl (72)	0.98 U	4.8 J	2.7 J	4.8 U	0.69 J	0.97 U	0.99 U	0.97 U	0.98 U	0.69 J
3,3',4,4'-Tetrachlorobiphenyl (77)	0.98 U	8.2	4.3	4.8 U	2	0.77 J	0.54 J	0.97 U	0.98 U	1.7 J
3,3',4,5'-Tetrachlorobiphenyl (79)	0.98 U	4.8 J	2 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.98 J
3,4,4',5-Tetrachlorobiphenyl (81)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,3',4-Pentachlorobiphenyl (82)	0.98 U	35	15 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	1.6 J
2,2',3,3',5-Pentachlorobiphenyl (83)	0.98 U	0.95 U	0.97 U	4.8 U	2.4 J	0.97 U	0.99 U	0.97 U	0.98 U	6.3 J
2,2',3,3',6-Pentachlorobiphenyl (84)	1.9 J	120	47	4.8 U	7 J	0.97 U	1.3 J	4.6 J	2.3 J	15 J
2,2',3,4,6'-Pentachlorobiphenyl (89)	0.98 U	3.6 J	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,5,5'-Pentachlorobiphenyl (92)	2.5 J	230	95	4.8 U	16 J	0.97 U	1.4 J	9.2 J	4.8 J	25

TABLE 2-4
Post-Removal Biota Detection Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-Background									
Sample ID	VWW06-CRB06-0112	VWW06-CRB07-0112	VWW06-CRB08-0112	VWW06-FS06-0112	VWW06-FS07-0112	VWW06-CRB05-0212	VWW06-CRB05P-0212	VWW06-FS05-0212	VWW06-FS05P-0212	VWW06-FS08-0212
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	02/01/12	02/01/12	02/01/12
Chemical Name										
2,2',3,5,6'-Pentachlorobiphenyl (94)	0.98 U	2.2 J	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,5',6-Pentachlorobiphenyl (95)	5.9 J	540	180	7.6 J	35	2.4 J	3.5 J	26 J	11 J	70
2,2',3,6,6'-Pentachlorobiphenyl (96)	0.98 U	1 J	0.69 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',4,4',5-Pentachlorobiphenyl (99)	9.8 J	580	280	21 J	43	18 J	20 J	24	20 J	54
2,2',4,5',6-Pentachlorobiphenyl (103)	0.98 U	7.1 J	3 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	1.1 J
2,2',4,6,6'-Pentachlorobiphenyl (104)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,3',4,4'-Pentachlorobiphenyl (105)	4.8	270	130	15	20	9.8 J	11	13	13	17
2,3,3',4,6-Pentachlorobiphenyl (109)	2 U	69	31	2.1 J	4.5 J	1.9 J	2.2 J	2.9 J	2.1 J	4.8 J
2,3,3',5,5'-Pentachlorobiphenyl (111)	0.98 U	0.96 J	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,4,4',5-Pentachlorobiphenyl (114)	0.98 U	19	9.4	4.8 U	0.9 J	0.97 U	0.99 U	0.97 U	0.98 U	0.93 J
2,3',4,4',5-Pentachlorobiphenyl (118)	14	970	440	39	60	32	34	34	34	61
2,3',4,5,5'-Pentachlorobiphenyl (120)	0.98 U	5 J	2.5 J	4.8 U	0.93 J	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3',4,5',6-Pentachlorobiphenyl (121)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,3',4',5'-Pentachlorobiphenyl (122)	0.98 U	9.8 J	4.5 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3',4,4',5'-Pentachlorobiphenyl (123)	0.98 U	8.2	5.6	4.8 U	0.91 J	0.97 U	0.99 U	0.97 U	0.98 U	1.1 J
3,3',4,4',5-Pentachlorobiphenyl (126)	0.98 U	2.2	1.2 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
3,3',4,5,5'-Pentachlorobiphenyl (127)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,3',4,5'-Hexachlorobiphenyl (130)	0.98 U	78	29	4.8 U	4.1 J	1.6 J	2.2 J	1.5 J	0.98 U	4.1 J
2,2',3,3',4,6-Hexachlorobiphenyl (131)	0.98 U	3.9 J	2.9 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	1.8 J	220	69	4.8 U	7.8 J	0.97 U	0.71 J	4.2 J	3.2 J	11 J
2,2',3,3',5,5'-Hexachlorobiphenyl (133)	0.98 U	18 J	9 J	4.8 U	2.1 J	0.97 U	0.99 U	0.97 U	0.98 U	1.8 J
2,2',3,3',6,6'-Hexachlorobiphenyl (136)	0.71 J	67	27	4.8 U	4.8 J	0.97 U	0.99 U	2.5 J	0.98 U	8.1 J
2,2',3,4,4',5-Hexachlorobiphenyl (137)	0.98 U	42	17 J	4.8 U	2.1 J	0.62 J	0.99 U	0.97 U	0.98 U	1.4 J
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	1.4 J	160	62	4.8 U	9.2 J	0.97 U	1 J	4.4 J	3.6 J	9.2 J
2,2',3,4,5',6-Hexachlorobiphenyl (144)	0.98 U	29	12 J	4.8 U	2.2 J	0.97 U	0.99 U	0.97 U	0.98 U	2.4 J
2,2',3,4,6,6'-Hexachlorobiphenyl (145)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	1.5 J	140	64	9 J	13 J	4 J	4.4 J	7.5 J	9.4 J	11 J
2,2',3,4',5,6'-Hexachlorobiphenyl (148)	0.98 U	0.76 J	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,4',6,6'-Hexachlorobiphenyl (150)	0.98 U	0.83 J	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,5,6,6'-Hexachlorobiphenyl (152)	0.98 U	0.37 J	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',4,4',5,6'-Hexachlorobiphenyl (154)	0.98 U	11 J	6.3 J	4.8 U	2 J	0.97 U	0.8 J	0.97 U	0.98 U	1.5 J
2,2',4,4',6,6'-Hexachlorobiphenyl (155)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,3',4,4',6-Hexachlorobiphenyl (158)	1.5 J	120	49	4.8 U	6.1 J	3.4 J	3.5 J	3.2 J	3.6 J	4.9 J
2,3,3',4,5,5'-Hexachlorobiphenyl (159)	0.98 U	2.2 J	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,3',4',5,5'-Hexachlorobiphenyl (162)	0.98 U	6.6 J	3.4 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.97 J
2,3,3',4',5',6-Hexachlorobiphenyl (164)	0.98 U	70	23	4.8 U	2.6 J	0.97 U	0.99 U	0.97 U	0.98 U	2.5 J
2,3,3',5,5',6-Hexachlorobiphenyl (165)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	0.7 J	55	24	4.8 U	3.3	1.8 J	1.6 J	2.3 J	2 J	2.7 J
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	2.5 J	130	67	13 J	16 J	5.8 J	5 J	9.2 J	13 J	12 J
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	0.98 U	24	14 J	4.8 U	4.1 J	1.3 J	1.4 J	2.8 J	3.3 J	3.6 J
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	0.98 U	100	28	4.8 U	4.8 J	0.97 U	0.99 U	2.4 J	2.3 J	7.3 J
2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	0.98 U	3.8 J	0.97 U	4.8 U	0.86 J	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	0.98 U	7.1 J	4.1 J	4.8 U	0.96 J	0.97 U	0.99 U	0.97 U	0.98 U	0.91 J
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	0.98 U	81	26	4.8 U	3.8 J	2.7 J	2.9 J	2.9 J	3.4 J	6.2 J
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	0.98 U	24	14 J	4.8 U	5.2 J	1.5 J	1.4 J	1.6 J	0.98 U	4.5 J
2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	0.98 U	29	16 J	4.8 U	3.1 J	0.97 U	0.99 U	0.61 J	0.98 U	3.2 J
2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	2 U	2.9 J	1.3 J	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	2 U
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	0.98 U	0.95 U	0.97 U	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	2 U	61	32	4.7 J	10 J	2.6 J	2.6 J	5.8 J	5.6 J	7.6 J
2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	0.98 U	0.95 U	0.97 U	4.8 U	0.66 J	0.97 U	0.99 U	0.97 U	0.98 U	0.62 J
2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	2 U	7.2 J	3.8 J	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	2 U
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	0.88 J	120	63	14 J	17 J	4.5 J	4.7 J	15 J	19 J	20 J

TABLE 2-4
Post-Removal Biota Detection Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-Background									
Sample ID	VWW06-CRB06-0112	VWW06-CRB07-0112	VWW06-CRB08-0112	VWW06-FS06-0112	VWW06-FS07-0112	VWW06-CRB05-0212	VWW06-CRB05P-0212	VWW06-FS05-0212	VWW06-FS05P-0212	VWW06-FS08-0212
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	02/01/12	02/01/12	02/01/12
Chemical Name										
2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	0.98 U	0.95 U	0.97 U	4.8 U	1.4 J	0.97 U	0.99 U	0.97 U	0.98 U	1.3 J
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	0.98 U	4.5	2.8	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	0.98 U	21	9.1 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	0.98 U	6 J	2.3 J	4.8 U	0.92 J	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	0.98 U	25	21	4.8 U	5 J	1.4 J	1.2 J	3.2 J	3.7 J	2.6 J
2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	0.98 U	10 J	7.2 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	0.98 U	15 J	9.2 J	5.6 J	5.5 J	1 J	1 J	3.9 J	4.4 J	4.3 J
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	0.98 U	1.2 J	1 J	4.8 U	1.5 J	0.97 U	0.99 U	0.81 J	1.2 J	1.4 J
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	2 U	2 J	2.1 J	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	2 U
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	0.98 U	4.1 J	3.5 J	2 J	3.4 J	0.97 U	0.99 U	2 J	2 J	3.4 J
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	0.98 U	11 J	8.6 J	4.3 J	7.2 J	0.97 J	1.3 J	2 J	2.6 J	6.2 J
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	0.98 U	28	21	4.8 U	2 J	1.2 J	0.92 J	2.8 J	3.2 J	1.5 J
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	0.98 U	1.2 J	0.97 J	4.8 U	0.96 U	0.97 U	0.99 U	0.97 U	0.98 U	0.99 U
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	0.98 U	14 J	12 J	4.8 U	1.9 J	0.97 U	0.99 U	4.6 J	6.3 J	3.1 J
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	0.98 U	1.8 J	2 J	4.8 U	0.96 U	0.97 U	0.99 U	1.8 J	2 J	0.99 U
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	0.98 U	6 J	4.8 J	4.8 U	1.8 J	1.5 J	0.88 J	3.8 J	5 J	1.8 J
Decachlorobiphenyl (209)	2 U	4.6 J	5 J	4.4 J	2.3 J	1.9 U	2 U	4.4 J	4.5 J	2 U
Congeners (21/33)	2 U	17 J	11 J	9.5 U	1.8 J	1.9 U	2 U	2.1 J	2 U	2.4 J
Congeners (26/29)	2 U	7.7 J	6.4 J	9.5 U	1.2 J	1.9 U	2 U	0.82 J	0.67 J	1.3 J
Congeners (28/20)	2 U	52	42 J	9.5 U	8.4 J	2.5 J	2.7 J	6.6 J	4.2 J	8.9 J
Congeners (30/18)	2 U	11 J	11 J	9.5 U	1.9 U	1.9 U	2 U	2 J	2 U	2 U
Congeners (40/71)	0.78 J	33 J	16 J	9.5 U	2.1 J	0.85 J	1.1 J	2.2 J	0.84 J	4.3 J
Congeners (44/47/65)	10 J	160	95	14 U	20 J	11 J	11 J	19 J	13 J	33 J
Congeners (50/53)	2 U	20	8.3 J	9.5 U	1.1 J	1.9 U	2 U	1.6 J	2 U	2.1 J
Congeners (59/62/75)	2.9 U	10	6.5 J	14 U	0.73 J	2.9 U	3 U	0.87 J	2.9 U	1.9 J
Congeners (61/70/74/76)	8.5 J	420	210	19 U	44 J	7.6 J	7.4 J	24 J	15 J	65 J
Congeners (69/49)	2.3 J	150	80	9.5 U	11 J	1.1 J	0.85 J	12 J	5.3 J	23 J
Congeners (86/87/97/108/119/125)	7.2 J	520	220	5.6 J	34 J	3 J	3.4 J	18 J	9.8 J	50 J
Congeners (88/91)	1.4 J	100	31 J	9.5 U	6.6 J	1.9 U	1.4 J	5.2 J	2.2 J	13 J
Congeners (93/100)	2 U	5.5 J	1.8 J	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	2 U
Congeners (98/102)	2 U	17 J	3.7 J	9.5 U	1.9 U	1.9 U	2 U	1.9 U	2 U	1.8 J
Congeners (107/124)	5.9 U	39	16 J	28 U	2.1 J	5.8 U	5.9 U	5.8 U	5.9 U	2.4 J
Congeners (110/115)	15 J	1,100	500	12 J	65	18 J	21 J	33 J	19 J	95
Congeners (113/90/101)	16 J	1,300	550	25 J	90	7.3 J	9.2 J	47 J	28 J	130
Congeners (117/116/85)	2.5 J	170	75	14 U	11 J	4.6 J	4.7 J	6.6 J	3.4 J	12 J
Congeners (128/166)	1.2 J	160	73	9.5 U	8.2 J	4.5 J	4.8 J	5.1 J	6.5 J	7.3 J
Congeners (134/143)	2 U	28 J	14 J	9.5 U	1.3 J	1.9 U	2 U	1.9 U	2 U	1.3 J
Congeners (138/163/129)	10 J	1,100	490	48 J	65	33	35 J	40 J	45	56 J
Congeners (139/140)	2 U	20 J	8.8 J	9.5 U	1.4 J	1.9 U	2 U	1.9 U	2 U	1 J
Congeners (147/149)	5.9 J	610	160	7.9 J	27 J	4.4 J	6.4 J	14 J	8.2 J	40
Congeners (151/135)	2.3 J	210	83	9.5 U	15 J	1.9 U	1.4 J	6 J	3.6 J	18 J
Congeners (153/168)	11 J	900	420	50 J	75	35	37	45	51	63
Congeners (156/157)	1.5 J	150	68	5.6 J	6.2	5.2	4.9	4.7	5.7	5.3
Congeners (171/173)	2 U	44	23 J	9.5 U	5.9 J	1.7 J	1.7 J	1.9 U	2.4 J	3.6 J
Congeners (180/193)	2.7 J	230	120	27 J	40	11 J	12 J	22 J	26	30 J
Congeners (198/199)	2 U	45	29	17 J	15 J	2.6 J	2.3 J	12 J	16 J	16 J
Total Dichlorobiphenyls	17	21	17	0 U	13	8.6	21	8.2	0 U	11
Total Heptachlorobiphenyls	7	910	420	58	120	31	32	62	75	99
Total Hexachlorobiphenyls	40	4,200	1,700	120	260	94	100	140	140	250
Total Monochlorobiphenyls	0 U	0 U	1.8	0 U	5.3	0 U	0 U	1.1	0 U	4
Total Nonachlorobiphenyls	0 U	21	18	0 U	4.5	1.5	0.88	10	13	4.9
Total Octachlorobiphenyls	0 U	140	100	28	39	7.3	7.6	27	33	35
Total Pentachlorobiphenyls	83	6,100	2,600	130	400	97	110	220	150	570

TABLE 2-4
Post-Removal Biota Detection Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-Background									
Sample ID	VWW06-CRB06-0112	VWW06-CRB07-0112	VWW06-CRB08-0112	VWW06-FS06-0112	VWW06-FS07-0112	VWW06-CRB05-0212	VWW06-CRB05P-0212	VWW06-FS05-0212	VWW06-FS05P-0212	VWW06-FS08-0212
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	02/01/12	02/01/12	02/01/12
Chemical Name										
Total Tetrachlorobiphenyls	37	1,600	870	55	150	37	37	120	60	260
Total Trichlorobiphenyls	4.8	170	130	11	25	4.9	7.4	22	11	30
Total Non-Dioxin-Like Congeners	160	12,000	5,200	300	920	230	260	560	430	1,200
PCB (total)	180	13000	5900	360	1000	280	320	620	480	1200
Toxic Equivalents (Total TEQ)	6.30E-04	0.26	0.14	0.0018	0.0029	0.0015	0.0016	0.0016	0.0016	0.0028
Total Metals (MG/KG)										
Lead	0.022 J	0.066	0.053	0.008 U	0.017 J	0.033 J	0.037 J	0.008 U	0.008 U	0.02 J
Zinc	13.8	20.7	13.7	13.2	15.2 J	19	19.2	11.3	10.1	16.4
Wet Chemistry (PCT)										
% Solids	40.6	33.4	36.5	27	37.7	34.3	37.3	24.3	27.1	48.7
Lipids (%)	0.32	0.58	0.42	2.5	6.7	0.42	0.46	1.8	2.3	2.8

Notes:

Shading indicates detections

J - Estimated.

U - Nondetect or not detected at significantly greater than that in an associated blank.

MG/KG - Milligrams per kilogram

PCT - Percent

PG/G - Picograms per gram

TABLE 2-4
Post-Removal Biota Detection Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-Lagoon									
Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS04-0112	VWW06-FS02-0212	VWW06-FS03-0212
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12
Chemical Name										
Polychlorinated Biphenyl Congeners (PG/G)										
2-Chlorobiphenyl (1)	2.7 J	3.1 J	1.9 J	2 J	1.9 U	2.2 J	2.8 J	2.1 J	4.4 J	5.8 U
3-Chlorobiphenyl (2)	3.5 J	4.1 J	2.1 J	2.5 J	1.4 J	2 U	1.9 U	1.2 J	1.5 J	6 U
4-Chlorobiphenyl (3)	1.1 J	1.2 J	1.5 J	2 J	1 J	0.89 J	0.91 J	1.6 J	0.86 J	6.2 U
2,2'-Dichlorobiphenyl (4)	9.9 J	8.7 J	4.3 J	10 U	9.7 U	9.7 J	12 J	4.9 J	24	46 U
2,3'-Dichlorobiphenyl (6)	9.8 U	11 J	11 J	7.4 J	9.7 U	7.2 J	8.4 J	7.4 J	20	53 U
2,4'-Dichlorobiphenyl (8)	37	39	37	31	15 J	24	25	32	60	280 J
3,3'-Dichlorobiphenyl (11)	71	72	70	91	47	16 J	25	26	32	310 J
4,4'-Dichlorobiphenyl (15)	10 J	9.1 J	18 J	14 J	8.5 J	9.9 U	9.4 U	4 J	9.6 U	52 U
2,2',3-Trichlorobiphenyl (16)	10 J	11 J	4.2 J	1.4 J	0.97 U	5.9 J	6.9 J	8.9 J	17 J	76 J
2,2',4-Trichlorobiphenyl (17)	28	32	14 J	6.7 J	2.4 J	9.3 J	11 J	25	26	270 J
2,2',6-Trichlorobiphenyl (19)	11 J	11 J	2.3 J	1.6 J	0.97 U	9.8 J	11 J	8 J	29	110 J
2,3,4'-Trichlorobiphenyl (22)	58	63	130	56	27	31	35	37	80	430 J
2,3,5-Trichlorobiphenyl (23)	3.3 J	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.98 U	0.96 U	11 U
2,3,6-Trichlorobiphenyl (24)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.98 U	0.83 J	5.5 U
2,3',4-Trichlorobiphenyl (25)	23	26	18 J	17 J	8.3 J	12 J	13 J	14 J	29	210 J
2,3',6-Trichlorobiphenyl (27)	6.7 J	7.5 J	3.9 J	2.4 J	1 J	3.5 J	3.3 J	5.2 J	7.1 J	68 J
2,4',5-Trichlorobiphenyl (31)	220	250	170	200	90	140	160	130	250	1,900 J
2,4',6-Trichlorobiphenyl (32)	71	76	45	44	20	23	26	50	47	630 J
2,3',5'-Trichlorobiphenyl (34)	0.98 U	3.6 J	3.2 J	1.9 J	0.97 U	2.2 J	1.5 J	3.2 J	3.7 J	12 U
3,3',4-Trichlorobiphenyl (35)	2 U	2 U	3.4 J	2.7 J	1.9 U	2 U	1.9 U	2 U	1.9 U	12 U
3,3',5-Trichlorobiphenyl (36)	20	26	7.3 J	11 J	5.9 J	15 J	17 J	13 J	28	240 J
3,4,4'-Trichlorobiphenyl (37)	33	36	34	45	21	3.1 J	3.5 J	14 J	6.9 J	270 J
3,4',5-Trichlorobiphenyl (39)	0.98 U	1.6 J	3.5 J	1.6 J	0.97 U	0.99 U	0.94 U	1.1 J	0.96 U	11 U
2,2',3,4-Tetrachlorobiphenyl (41)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	1 U	5.4 J	3 J	56 J
2,2',3,4'-Tetrachlorobiphenyl (42)	78	79	44	47	21	9.5 J	9.5 J	60	42	780 J
2,2',3,5-Tetrachlorobiphenyl (43)	10 J	13 J	5.9 J	3.2 J	0.69 J	0.99 U	0.94 U	11 J	0.96 U	140 J
2,2',3,6-Tetrachlorobiphenyl (45)	26	22	3.2 J	2.7 J	1.2 J	13 J	17 J	18 J	34	220 J
2,2',3,6'-Tetrachlorobiphenyl (46)	10 J	10 J	3.2 J	1 U	0.97 U	3.3 J	3.8 J	7.7 J	9.9 J	120 J
2,2',4,5-Tetrachlorobiphenyl (48)	43	44	21	9.9 J	0.97 U	2.5 J	1.8 J	41	8.4 J	460 J
2,2',4,6'-Tetrachlorobiphenyl (51)	40	41	11 J	5.7 J	2.7 J	8.8 J	7.7 J	31	20	420 J
2,2',5,5'-Tetrachlorobiphenyl (52)	2,400	2,700	780	1,300	450	1,900	2,100	1,500	3,100	31,000
2,2',6,6'-Tetrachlorobiphenyl (54)	2 J	2.2 J	0.95 U	1 U	0.97 U	3.2 J	3.8 J	1.4 J	6 J	4.7 U
2,3,3',4-Tetrachlorobiphenyl (55)	2 U	2 U	1.9 U	2 U	1.9 U	2 U	1.9 U	10 J	1.9 U	28 U
2,3,3',4'-Tetrachlorobiphenyl (56)	280	300	140	210	100	37	39	160	130	2,400
2,3,3',5-Tetrachlorobiphenyl (57)	78	0.99 U	2.4 J	2.9 J	1.2 J	33	31 J	2.9 J	70	1,200 J
2,3,3',5'-Tetrachlorobiphenyl (58)	1.1 U	0.99 U	3.1 J	3.1 J	1.1 J	0.99 U	0.97 U	2.5 J	1.5 U	27 U
2,3,4,4'-Tetrachlorobiphenyl (60)	160	170	210	200	80	160	180	82	280	1,400 J
2,3,4',5-Tetrachlorobiphenyl (63)	53	56	93	61	23	57	62	25	92	460 J
2,3,4',6-Tetrachlorobiphenyl (64)	350	360	150	280	130	170	180	200	330	3,700
2,3',4,4'-Tetrachlorobiphenyl (66)	1,200	1,300	1,100	1,200	460	1,300	1,400	580	1,700	11,000
2,3',4,5-Tetrachlorobiphenyl (67)	29	32	21	22	12 J	13 J	15 J	17 J	33	310 J
2,3',4,5'-Tetrachlorobiphenyl (68)	18 J	19 J	27	18 J	8.8 J	23	22 J	10 J	31 J	180 J
2,3',5,5'-Tetrachlorobiphenyl (72)	29	24	21	25	10 J	28	32	16 J	45	320 J
3,3',4,4'-Tetrachlorobiphenyl (77)	52	53	56	72	26	15	17	24	34 J	380
3,3',4,5'-Tetrachlorobiphenyl (79)	71	71	19 J	16 J	7.4 J	19 J	21 J	15 J	38	460 J
3,4,4',5-Tetrachlorobiphenyl (81)	1.1 U	0.99 U	2.8	4.4	1.8 J	0.99 U	2.8 J	2	3.4	30 U
2,2',3,3',4-Pentachlorobiphenyl (82)	160	170	100	74	32	16 J	15 J	120	48	2,100
2,2',3,3',5-Pentachlorobiphenyl (83)	1.7 U	1.1 U	1.3 U	1.3 U	1 U	1.5 U	1.9 U	140	2.2 U	52 U
2,2',3,3',6-Pentachlorobiphenyl (84)	530	560	110	47	21	97	110	380	280	6,900
2,2',3,4,6'-Pentachlorobiphenyl (89)	14 J	15 J	4.1 J	2.9 J	1.2 U	1.6 U	2.1 U	14 J	2.5 U	170 J
2,2',3,5,5'-Pentachlorobiphenyl (92)	980	1,000	170	290	110	880	990	660	1,100	14,000

TABLE 2-4
Post-Removal Biota Detection Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-Lagoon									
Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS04-0112	VWW06-FS02-0212	VWW06-FS03-0212
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12
Chemical Name										
2,2',3,5,6'-Pentachlorobiphenyl (94)	8.8 J	9.1 J	6 J	2.6 J	1.1 U	1.6 U	2.1 J	6.6 J	4.2 J	88 J
2,2',3,5',6-Pentachlorobiphenyl (95)	2,500	2,900	400	350	120	780	850	1,600	1,700	35,000
2,2',3,6,6'-Pentachlorobiphenyl (96)	5.8 J	5.7 J	0.95 U	1 U	0.97 U	3.3 J	3.9 J	4.1 J	7.5 J	85 J
2,2',4,4',5-Pentachlorobiphenyl (99)	3,100	3,500	3,700	2,800	1,200	3,800	4,300	1,500	3,700	33,000
2,2',4,5',6-Pentachlorobiphenyl (103)	31	33	6.2 J	7 J	3.6 J	27	29	22	39	430 J
2,2',4,6,6'-Pentachlorobiphenyl (104)	0.98 U	0.57 J	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.98 U	0.96 U	3.4 U
2,3,3',4,4'-Pentachlorobiphenyl (105)	1,600	1,800	1,800	2,000	740	2,500	2,800	740	2,600	16,000
2,3,3',4,6-Pentachlorobiphenyl (109)	380	400	440	410	150	550	630	180	570	3,300
2,3,3',5,5'-Pentachlorobiphenyl (111)	1.2 U	5.4 J	6.7 J	6.1 J	0.97 U	6.5 J	6.6 J	2.3 J	5.6 J	39 U
2,3,4,4',5-Pentachlorobiphenyl (114)	120	120	150	120	39	170	200	52	170	1,300
2,3',4,4',5-Pentachlorobiphenyl (118)	5,600	6,400	6,400	6,100	2,400	8,200	9,300	2,400	8,200	54,000
2,3',4,5,5'-Pentachlorobiphenyl (120)	22	24	27	29	11 J	42	50	11 J	42	160 J
2,3',4,5',6-Pentachlorobiphenyl (121)	1.4 J	1.4 J	1 U	1 U	0.97 U	2.7 J	2.4 J	1 U	2.1 J	39 U
2,3,3',4',5'-Pentachlorobiphenyl (122)	61	58	48	48	19 J	1.2 U	1.5 U	27	1.8 U	41 U
2,3',4,4',5'-Pentachlorobiphenyl (123)	64	71	81	63	26	82 J	120 J	22	96	530
3,3',4,4',5-Pentachlorobiphenyl (126)	13 J	8.5 J	9.1 J	17	6	26	20	5.5	23	150 J
3,3',4,5,5'-Pentachlorobiphenyl (127)	7.6 J	8 J	5.3 J	6.7 J	0.97 U	13 J	13 J	4.1 J	8.8 J	41 U
2,2',3,3',4,5'-Hexachlorobiphenyl (130)	320	360	160	230	77	320	380	200	340	3,800
2,2',3,3',4,6-Hexachlorobiphenyl (131)	19 J	20 J	11 J	6.4 J	3.6 J	3.9 J	4.1 J	11 J	5.2 J	270 J
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	920	1,000	140	170	62	120	140	650	210	12,000
2,2',3,3',5,5'-Hexachlorobiphenyl (133)	74	83	46	73	21	63	75	46	81	870 J
2,2',3,3',6,6'-Hexachlorobiphenyl (136)	290	310	12 J	9.9 J	4.7 J	48	56	210	85	4,800
2,2',3,4,4',5-Hexachlorobiphenyl (137)	220	240	190	150	55	240	270	110	210	2,400
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	670	690	190	280	110	580	700	430	540	8,800
2,2',3,4,5',6-Hexachlorobiphenyl (144)	120	130	18 J	31	15 J	76	89	84	76	1,800 J
2,2',3,4,6,6'-Hexachlorobiphenyl (145)	1.1 J	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.98 U	0.96 U	11 U
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	650	710	690	730	270	960	1,100	340	860	6,800
2,2',3,4',5,6'-Hexachlorobiphenyl (148)	3.6 J	3.6 J	1.1 J	1.4 J	0.97 U	4.2 J	5.2 J	2.8 J	0.96 U	13 U
2,2',3,4',6,6'-Hexachlorobiphenyl (150)	3.7 J	4 J	0.95 U	1.1 J	0.97 U	1 J	0.94 U	2.9 J	0.96 U	18 J
2,2',3,5,6,6'-Hexachlorobiphenyl (152)	1.9 J	2.1 J	0.72 J	1 U	0.97 U	0.99 U	0.94 U	0.82 J	0.96 U	24 J
2,2',4,4',5,6'-Hexachlorobiphenyl (154)	56	58	59	55	23	61	73	31	51	600 J
2,2',4,4',6,6'-Hexachlorobiphenyl (155)	0.98 U	1 J	0.95 U	1.6 J	0.97 U	1.8 J	2.1 J	0.98 U	0.96 U	7.9 U
2,3,3',4,4',6-Hexachlorobiphenyl (158)	590	680	600	590	230	790	950	300	670	6,600
2,3,3',4,5,5'-Hexachlorobiphenyl (159)	6.3 J	8.5 J	0.96 J	1.9 J	0.97 U	1.2 U	1.6 U	5.4 J	1.9 U	68 J
2,3,3',4',5,5'-Hexachlorobiphenyl (162)	35	40	33	33	11 J	58	69	14 J	54	350 J
2,3,3',4',5',6-Hexachlorobiphenyl (164)	310	340	130	180	70	87 J	140 J	190	130	3,400
2,3,3',5,5',6-Hexachlorobiphenyl (165)	1.2 J	0.74 J	1 J	1.4 J	0.97 U	0.99 U	1.3 J	0.98 U	0.96 U	12 U
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	280	300	290	280	110	500	590	130	420	2,700
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.3 U	1.3 J	0.95 U	1 U	0.97 U	1.3 U	1.7 U	0.98 U	2.1 U	34 U
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	510	590	190	380	150	1,000	1,200	340	760	4,900
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	100	120	71	100	40	190	220	64	160	820 J
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	360	410	61	120	40	49	60	290	77	3,800
2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	15 J	17 J	4.4 J	11 J	4.5 J	20 J	24	12 J	13 J	180 J
2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	25	28	3 J	8 J	2.5 J	5.1 J	5.5 J	21	6.3 J	340 J
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	300	340	110	240	76	280	310	220	300	2,900
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	82	94	40	80	26	56	62	63	71	850 J
2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	100	110	7.8 J	17 J	5.2 J	14 J	16 J	92	17 J	1,400 J
2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	13 J	15 J	13 J	13 J	3.7 J	27	30	8.3 J	14 J	69 J
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	5.2 J	5.1 J	4.1 J	3.3 J	1.5 J	4.7 J	4.9 J	3 J	3.1 J	37 J
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	230	260	200	240	99	450	550	160	340	2,400
2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	1.2 J	0.94 J	0.57 J	0.9 J	0.97 U	0.99 U	1.6 J	0.98 U	0.96 U	6.8 U
2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	31 J	48 J	1.9 U	2 U	6.4 J	39	1.9 U	23	27 J	22 U
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	540	620	450	690	270	730	850	330	580	4,500

TABLE 2-4
Post-Removal Biota Detection Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-Lagoon									
Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS04-0112	VWW06-FS02-0212	VWW06-FS03-0212
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12
Chemical Name										
2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	3.1 J	3 J	1.5 J	2.7 J	1.9 J	4.5 J	5.1 J	1.1 J	2.4 J	14 J
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	19	20	13	20	7.4	35	43	9.8	22 J	150 J
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	79	82	43	70	28	8.7 J	190	50	130	840 J
2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	24	25	14 J	22	9.2 J	43	50	15 J	32	280 J
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	79	86	28	96	43	150	200	66	110	840 J
2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	31	34	9.8 J	28	12 J	65	73	31	43	310 J
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	48	56	32	61	30	75	83	41	54	470 J
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	5.6 J	4.8 J	2.6 J	6.6 J	2.7 J	7.6 J	8.1 J	3.4 J	5.6 J	48 J
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	7.2 J	7.2 J	1.9 U	2 U	1.9 U	1.4 J	2.4 J	8.3 J	1.9 U	68 J
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	17 J	20 J	8.3 J	19 J	9.8 J	24	26	15 J	17 J	150 J
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	36	38	20	45	18 J	37	44	29	37	320 J
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	75	83	34	65	31	160	180	78	100	730 J
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	2.8 J	3.7 J	0.95 U	1 J	0.97 U	6.3 J	7.5 J	3.7 J	2.5 J	36 J
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	33	39	9.3 J	27	14 J	61	71	40	42	450 J
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	5.8 J	7 J	2.8 J	6.8 J	4.9 J	10 J	11 J	5.4 J	6.6 J	69 J
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	18 J	19 J	8.8 J	19 J	10 J	24	29	17 J	17 J	160 J
Decachlorobiphenyl (209)	13 J	15 J	6.1 J	16 J	9.8 J	21	23	15 J	13 J	130 J
Congeners (21/33)	93	100	57	39 J	15 J	23 J	26 J	88	60	790 J
Congeners (26/29)	48	54	26 J	40	20 J	34 J	39	30 J	65	440 J
Congeners (28/20)	320	350	500	370	160	230	260	180	460	2,600 J
Congeners (30/18)	62	64	23 J	16 J	6.3 J	26 J	28 J	46	79	570 J
Congeners (40/71)	200	210	170	97	48	31 J	29 J	160	75	1,800 J
Congeners (44/47/65)	940	980	700	480	240	420	440	560	850	11,000
Congeners (50/53)	110	110	43	15 J	6.5 J	43	47	68	96	1,000 J
Congeners (59/62/75)	63	64	61	42 J	19 J	52 J	54 J	38	85	630 J
Congeners (61/70/74/76)	2,600	2,800	2,000	2,100	830	2,300	2,400	1,300	3,500	26,000
Congeners (69/49)	870	910	290	390	190	520	560	510	1,000	10,000
Congeners (86/87/97/108/119/125)	2,500	2,700	1,200	920	470	710	820	1,600	1,300	33,000
Congeners (88/91)	470	510	65	160	71	180	190	300	290	6,000
Congeners (93/100)	29	30 J	26 J	19 J	9.5 J	27 J	30 J	17 J	35 J	370 J
Congeners (98/102)	77	82	31 J	16 J	5.4 J	2.2 J	2 U	60	16 J	930 J
Congeners (107/124)	200	220	130	160	55	210	250	110	240	2,100 J
Congeners (110/115)	6,100	6,700	3,600	3,500	1,600	1,200	1,400	3,200	2,600	70,000
Congeners (113/90/101)	5,900	6,600	2,400	3,800	1,400	3,800	4,300	3,600	5,800	80,000
Congeners (117/116/85)	800	860	780	690	270	930	1,100	460	1,100	7,700
Congeners (128/166)	750	840	530	640	270	990	1,200	430	840	8,600
Congeners (134/143)	130	120	35 J	23 J	7 J	14 J	17	88	27 J	1,800 J
Congeners (138/163/129)	5,200	5,600	4,300	5,200	1,900	9,100	11,000	2,800	7,800	59,000
Congeners (139/140)	95	100	84	72	33	100	120	54	82	1,100 J
Congeners (147/149)	2,700	2,900	740	1,400	530	390	450	1,700	560	35,000
Congeners (151/135)	830	900	130	180	69	320	380	610	400	12,000
Congeners (153/168)	4,100	4,600	4,500	4,500	1,700	7,400	8,800	2,200	6,400	46,000
Congeners (156/157)	830	920	870	920	340	1,500	1,700	380	1,300	8,000
Congeners (171/173)	180	210	100	140	62	300	340	110	200	1,700 J
Congeners (180/193)	960	1,100	660	980	390	1,700	2,000	580	1,400	8,500
Congeners (198/199)	160	180	97	210	92	230	250	130	160	1,200 J
Total Dichlorobiphenyls	130	150	140	140	70	57	70	75	140	590
Total Heptachlorobiphenyls	3,600	4,100	2,000	3,100	1,200	5,000	6,000	2,400	4,100	34,000
Total Hexachlorobiphenyls	19,000	21,000	14,000	16,000	6,000	21,000	24,000	11,000	19,000	230,000
Total Monochlorobiphenyls	7.4	8.5	5.5	6.6	2.4	4.1	4.7	4.8	6.8	0 U
Total Nonachlorobiphenyls	57	65	21	53	29	96	110	63	66	680
Total Octachlorobiphenyls	460	510	230	530	240	760	870	400	530	4,200
Total Pentachlorobiphenyls	31,000	34,000	22,000	22,000	8,700	25,000	29,000	17,000	33,000	370,000

TABLE 2-4
Post-Removal Biota Detection Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-Lagoon									
Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS04-0112	VWW06-FS02-0212	VWW06-FS03-0212
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12
Chemical Name										
Total Tetrachlorobiphenyls	9,800	10,000	6,100	6,500	2,700	7,200	7,700	5,400	12,000	110,000
Total Trichlorobiphenyls	1,000	1,100	1,000	850	380	570	650	650	1,200	8,700
Total Non-Dioxin-Like Congeners	57,000	62,000	35,000	39,000	16,000	48,000	56,000	34,000	56,000	660,000
PCB (total)	65000	72000	45000	49000	19000	62000	71000	37000	69000	750,000
Toxic Equivalents (Total TEQ)	1.6	1.2	1.2	2	0.71	3	2.4	0.66	2.7	18
Total Metals (MG/KG)										
Lead	5.14	4.12	3.55	2.07	2.15	0.097 J	0.055 J	0.271	0.057	1.65 J
Zinc	21.6	20.3	19.3	26.4	26.6	16.9 J	10.8 J	13.5	16.1	15.5
Wet Chemistry (PCT)										
% Solids	35.8	31.2	34.8	35.4	34.4	30.0	28.4	22.5	23.4	33.1
Lipids (%)	0.37	0.41	0.24	0.62	0.46	0.38	0.4	0.38	0.8	5.4

Notes:

Shading indicates detections

J - Estimated.

U - Nondetect or not detected at significantly greater than that in an associated blank.

MG/KG - Milligrams per kilogram

PCT - Percent

PG/G - Picograms per gram

TABLE 2-5
Post-Removal Maximum Biota Tissue PCB and Metal Concentration Summary
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID Sample Date	HHRA SL	Maximum SWMU 6 Crab Concentrations 1/31/12	Maximum Background Crab Concentrations 1/31/12-2/1/12	Maximum SWMU 6 Fish Concentrations 1/31/12-2/1/12	Maximum Background Fish Concentrations 1/31/12-2/1/12
Chemical Name					
Polychlorinated Biphenyl Congeners (PG/G)					
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	810	20	4.5	150 J	4.8 U
2,3,3',4,4'-Pentachlorobiphenyl (105)	810	**2,000**	270	**16,000**	20
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	810	300	55	**2,700**	4.8 U
2,3,4,4',5-Pentachlorobiphenyl (114)	810	150	19	**1,300**	4.8 U
2,3',4,4',5-Pentachlorobiphenyl (118)	810	**6,400**	**970**	**54,000**	61
2,3',4,4',5'-Pentachlorobiphenyl (123)	810	81	8.2	530	4.8 U
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	0.81	**1.3 J**	**0.99 U**	**34 U**	**4.8 U**
3,3',4,4',5-Pentachlorobiphenyl (126)	0.24	**17**	**2.2**	**150 J**	**4.8 U**
3,3',4,4'-Tetrachlorobiphenyl (77)	240	72	8.2	**380**	4.8 U
3,4,4',5-Tetrachlorobiphenyl (81)	81	4.4	0.99 U	30 U	4.8 U
Congeners (156/157)	810	**920**	150	**8,000**	6.2
Total Metals (MG/KG)					
Lead	0.47	**5.14**	0.066	**1.65 J**	0.02 J
Thallium	0.00046	**0.004 U**	**0.004 U**	**0.004 U**	**0.004 U**
Zinc	14	**26.6**	**20.7**	**16.9 J**	**16.4**

Notes:

The table only include metals and selected PCB congeners with published RSLs in USEPA RSL Fish Ingestion Table June 2011.

Bolded Values exceeded the HHRA SL;HHRA SL are adapted from Table 15 of Post-Removal SAP Addendum (CH2M HILL, 2012).

Maximum Site Crab Concentrations are maximum value of VWW06-CRB01 through VWW06-CRB04 collected from SWMU 6 lagoon;

Maximum Site Fish Concentrations are maximum value of VWW06-FS01 through VWW06-FS04 collected from SWMU 6 lagoon;

Maximum Background Crab Concentrations are maximum value of VWW06-CRB05 through VWW06-CRB08 collected from Laguna Punta Arenas ;

Maximum Background Fish Concentrations are maximum value of VWW06-FS05 through VWW06-FS08 collected from Laguna Punta Arenas ;

J - Estimated

U - Nondetect or not detected at significantly greater than that in an associated blank.

MG/KG - Milligrams per kilogram

PCT - Percent

PG/G - Picograms per gram

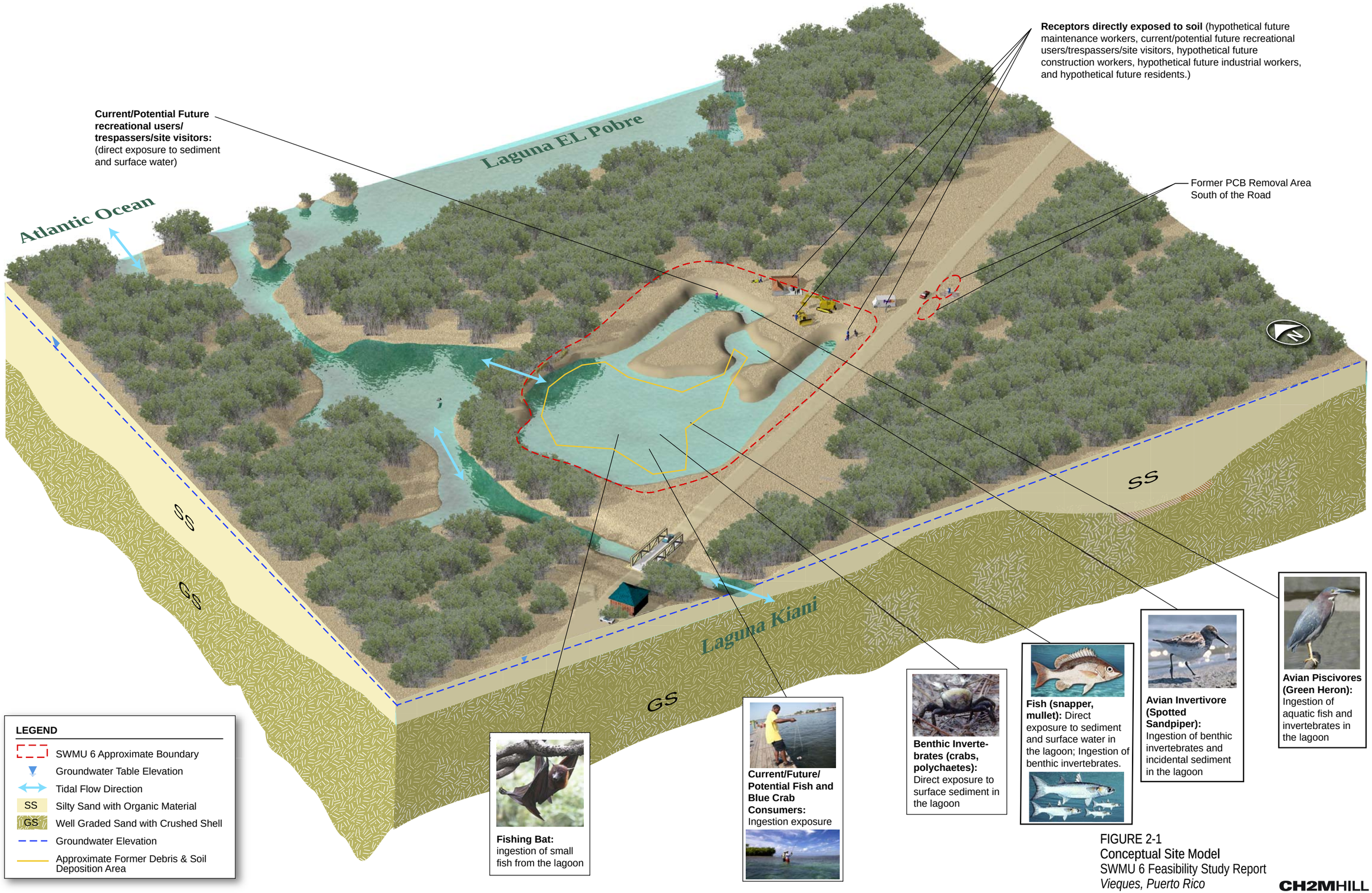
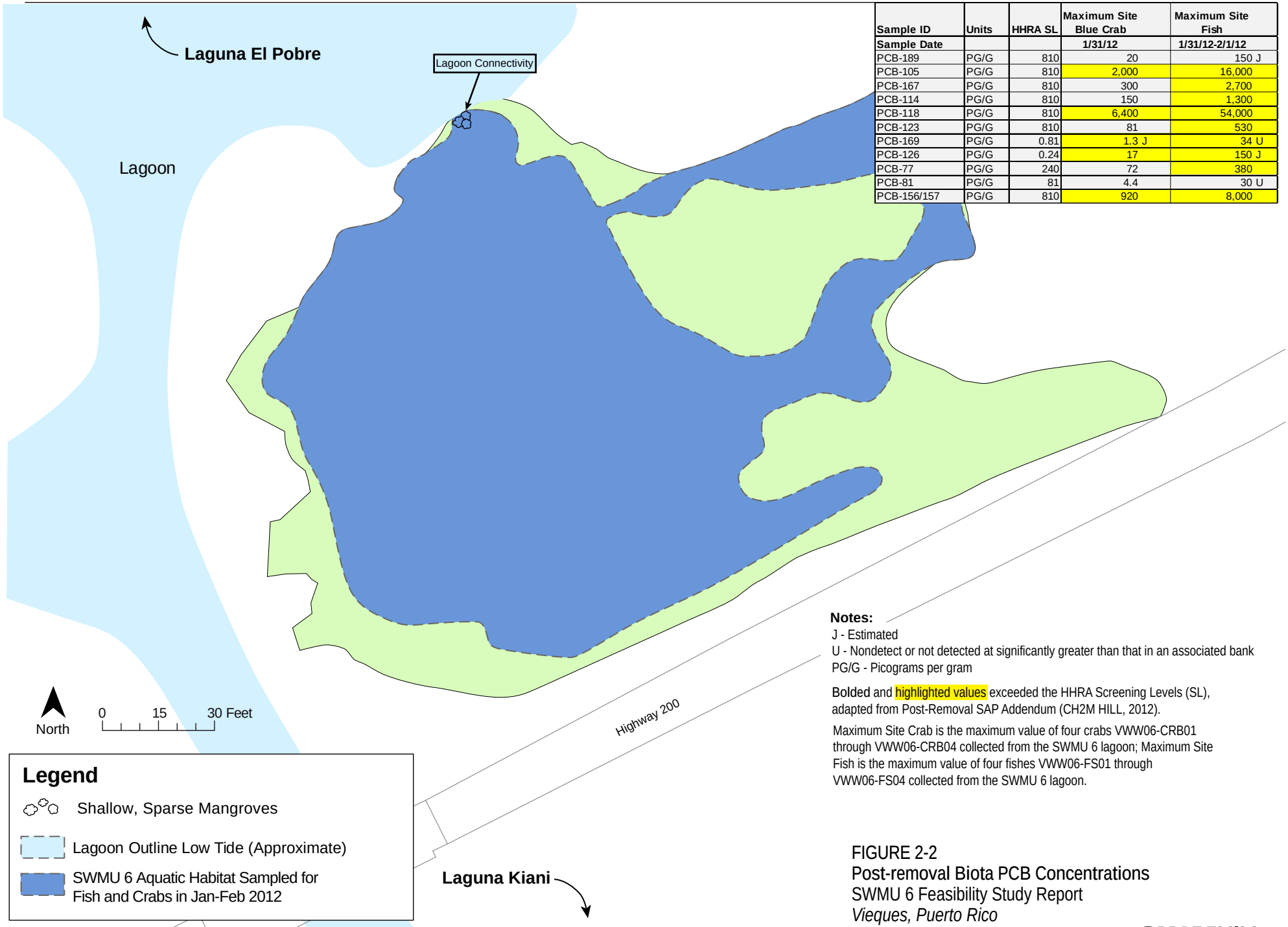


FIGURE 2-1
Conceptual Site Model
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL



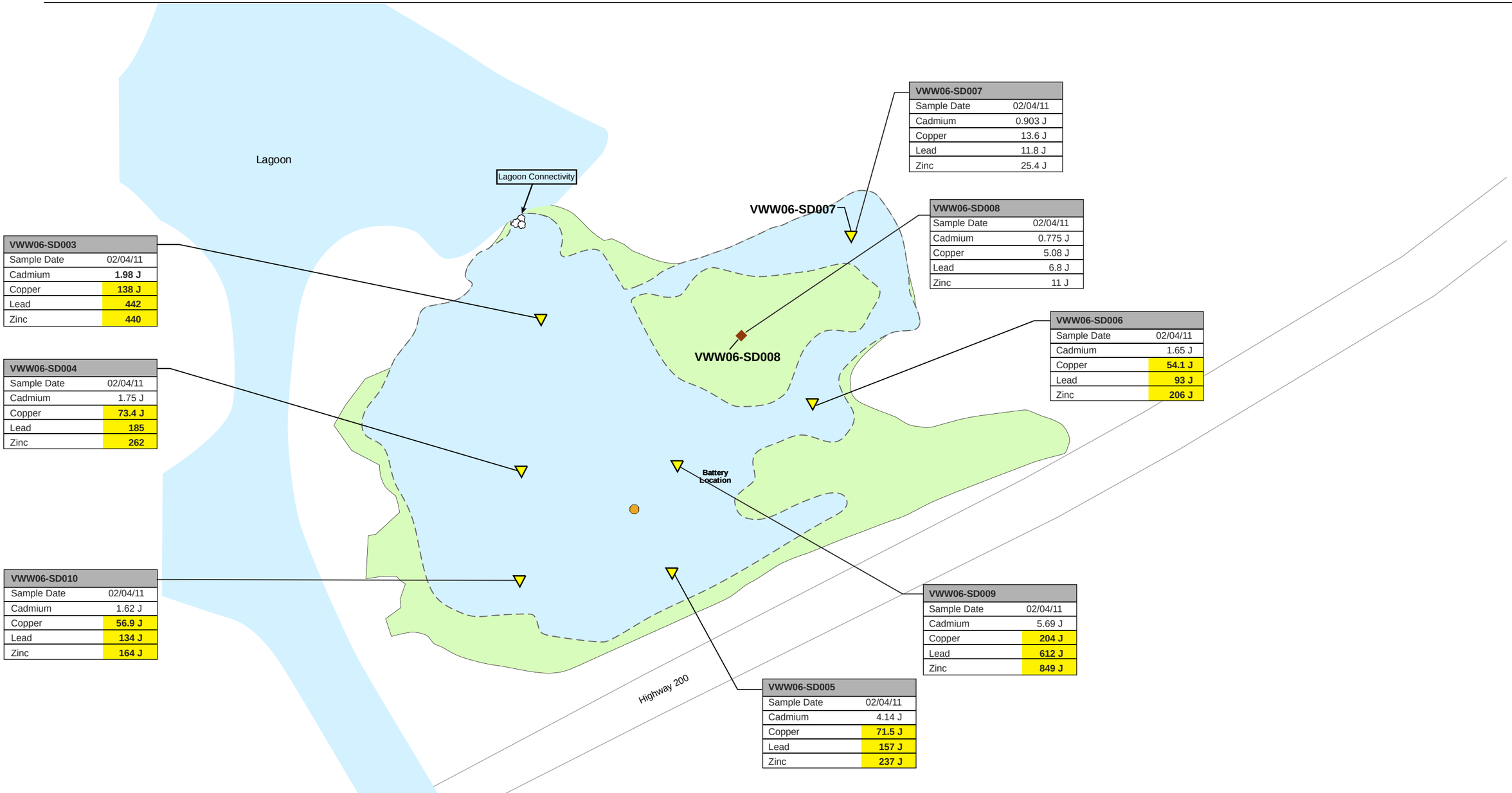
Sample ID	Units	HHRA SL	Maximum Site Blue Crab	Maximum Site Fish
Sample Date			1/31/12	1/31/12-2/1/12
PCB-189	PG/G	810	20	150 J
PCB-105	PG/G	810	2,000	16,000
PCB-167	PG/G	810	300	2,700
PCB-114	PG/G	810	150	1,300
PCB-118	PG/G	810	6,400	54,000
PCB-123	PG/G	810	81	530
PCB-169	PG/G	0.81	1.3 J	34 U
PCB-126	PG/G	0.24	17	150 J
PCB-77	PG/G	240	72	380
PCB-81	PG/G	81	4.4	30 U
PCB-156/157	PG/G	810	920	8,000

Notes:
J - Estimated
U - Nondetect or not detected at significantly greater than that in an associated bank
PG/G - Picograms per gram

Bolded and highlighted values exceeded the HHRA Screening Levels (SL), adapted from Post-Removal SAP Addendum (CH2M HILL, 2012).

Maximum Site Crab is the maximum value of four crabs VWW06-CRB01 through VWW06-CRB04 collected from the SWMU 6 lagoon; Maximum Site Fish is the maximum value of four fishes VWW06-FS01 through VWW06-FS04 collected from the SWMU 6 lagoon.

FIGURE 2-2
Post-removal Biota PCB Concentrations
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico



Legend

Sample Locations

- Surface Soil Sample (evaluated as sediment for ecological risk)
- Sediment Sample
- Approximate Original Battery
- Shallow, Sparse Mangroves
- Lagoon Outline Low Tide (Approximate)
- NTCRA Lead Hot Spot Excavation Area
- NTCRA Removal Area North of Road

North

0 15 30 Feet

COCs	SWMU 6 Background (UTL)	ESVs
Cadmium	--	1.2
Copper	54.1	34
Lead	15.1	46.7
Zinc	87.3	150

Notes:
All units in mg/kg.
J - Estimated value

Bolded and highlighted values exceeded the Marine Sediment Ecological Screening Values (ESVs)

FIGURE 2-3
Post-removal Sediment Metals COC Concentrations
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

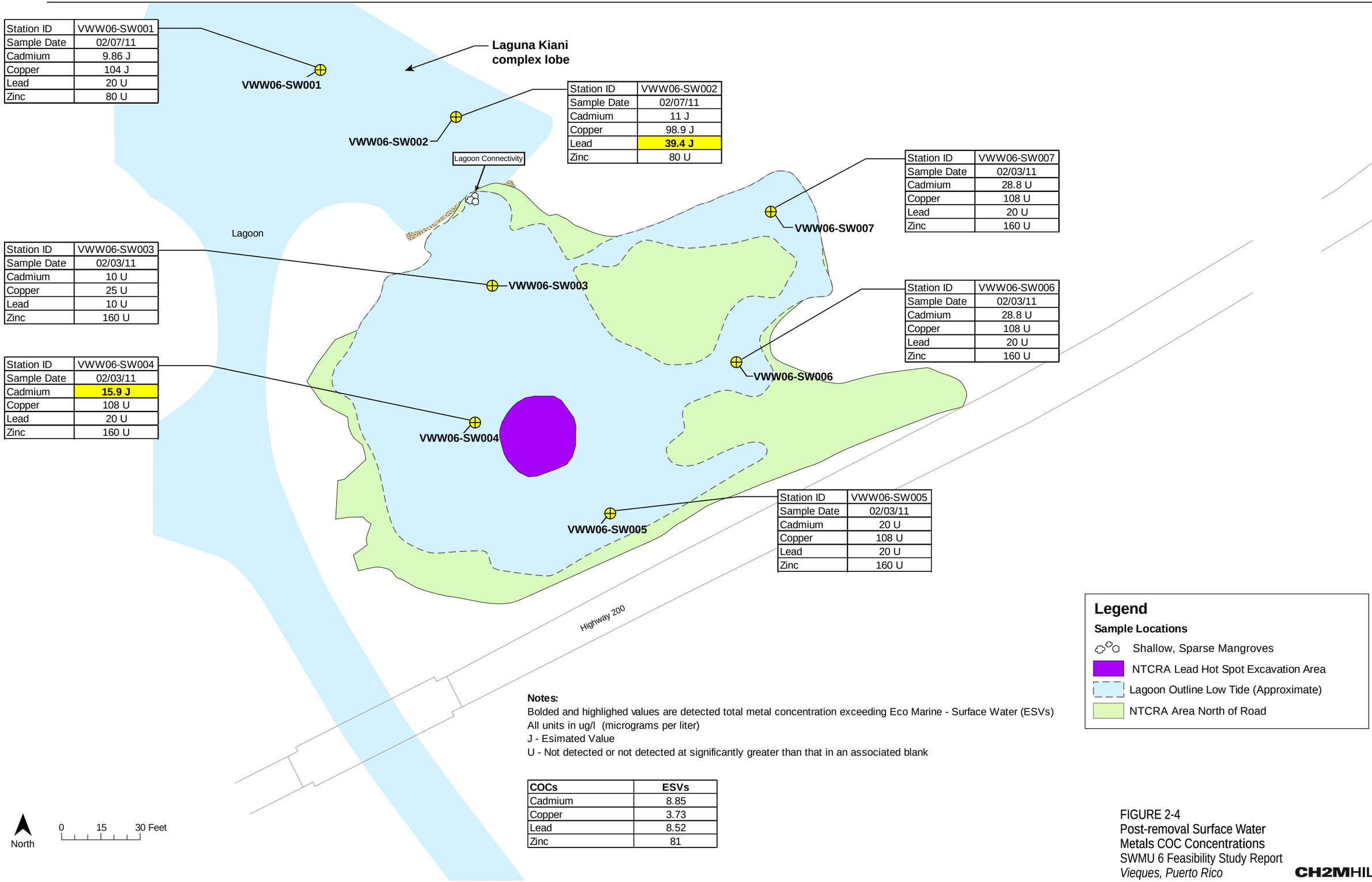


FIGURE 2-4
Post-removal Surface Water
Metals COC Concentrations
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

SECTION 3

Post-removal Human Health Risk Assessment Summary

An HHRA was conducted for SWMU 6 that evaluated potential/hypothetical current and future health risks from exposure to site soil, sediment, surface water, and biota (fish and blue crab) representing post-removal conditions. The HHRA was conducted in accordance with the Vieques Master HHRA protocol (CH2M HILL, 2010a), which is consistent with EPA Region 2 policy and EPA guidance documents, with the exception of site-specific evaluations of the fish and blue crab consumption pathways. The results of preliminary risk estimates of the fish and blue crab consumption pathways based on surface water and sediment data indicated risk estimates exceeding EPA acceptable levels for a few analytes. Therefore, an additional evaluation of fish and blue crab consumption pathways was performed using biota data collected from the site and a very conservative ingestion frequency of two meals per week. However, based on observations made during the biota sampling event, it was apparent that an ingestion frequency of two meals per week was unrealistic for the site due to the very small population of edible-size fish and blue crab, as discussed in Section 3.2.

The primary guidance documents used in preparation of the HHRA are the *EPA Risk Assessment Guidance for Superfund (RAGS) Parts A, D, E, and F* (EPA, 1989; 2001; 2004; 2009), *Exposure Factors Handbook* (EPA, 1997), and *Standard Default Exposure Factors* (EPA, 1991). The complete HHRA is presented in **Appendix E**. This section summarizes the key components and findings of the HHRA.

3.1 Chemicals of Potential Concern

The analytical data used in the HHRA consist of surface soil, surface water, and sediment data collected during the Post-Removal Supplemental Confirmatory sampling conducted in February 2011 (CH2M HILL, 2010b), supplemented with four historical soil samples (collected at sampling stations #VWW06-SO132, -SO136, -SO137, and -SO142) collected within site boundaries during the 2009 confirmation sampling and site restoration activities (Shaw Environmental and Infrastructure, Inc., 2010). In addition, because preliminary risk estimates for the fish/blue crab consumption scenario (modeled using sediment and surface water concentrations measured in 2011) exceeded EPA acceptable risk levels, analytical data generated from fish and blue crab samples collected in January/February 2012 were also used in the HHRA.

Soil samples were divided into two sample populations based on historical contamination sources: 1) the main disposal area and lagoon located north of Highway 200 (referred to as the “North Area” for the purposes of discussion) and 2) the small debris area on the south side of Highway 200 with potentially elevated PCBs, which is referred to as the “PCB Removal Area” for the purposes of discussion. The North Area surface soil dataset consists of four surface soil samples collected from the 0-6 inch interval below the excavated waste during the 2009 sampling activities (the interval deemed best representative of potential contaminants leached or released from the debris), and two samples collected from the intermittently-inundated sediment area (that is, an intertidal area that is exposed [not covered by water] for as long as 12 hours per day and available for contact as soil during that time) during the confirmatory sampling in 2011. The PCB Removal Area soil dataset consists of two surface soil samples (0-6 inches below the removed material) collected in 2011 following the final excavation activities in this area. Soil samples collected from the North Area in 2011 were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/PCBs, explosives, and inorganics. The two soil samples from the PCB Removal Area were analyzed for PCBs.

The surface water and sediment datasets used in the HHRA consist of five and seven samples, respectively, collected in February 2011 from the lagoon located in the main disposal area of SWMU 6. Samples collected below the low-tide line (i.e., below the intertidal zone) were considered sediment for the HHRA, and samples collected within or above the intertidal zone were treated as surface soil. Two co-located surface water/sediment samples (SW/SD001 and SW/SD002) were collected north of SWMU 6 to evaluate potential offsite migration of site-related chemicals to the adjacent Kiani Lagoon lobe via tidal exchange. Review of data from these stations

indicates that detected concentrations are comparable to background levels. Therefore, the two offsite locations (SW/SD 001 and SW/SD 002) are not impacted by SWMU 6-related sources; therefore, they were appropriately excluded from the SWMU 6 HHRA dataset.

The biota analytical data used in the HHRA consist of four fish and four blue crab samples collected from the SWMU 6 lagoon. Gutted fish data from two snook and two mullet and whole-body blue crab data were included in the HHRA. The biota samples were analyzed for lead, thallium, zinc, and PCBs (the primary risk-driving chemicals in the preliminary risk estimates based on modeled concentrations using surface water/sediment data). Gutted whole-body fish and whole-body crab were sampled to reflect local food preparation and cooking methods. As stated by representatives from EPA and PREQB on October 27, 2011, gutted whole-body fish and whole-body crab are occasionally used in stews and soups prepared by local residents. The concentrations measured in the fish and blue crab samples were used in place of modeled fish and blue crab concentrations for these analytes in the HHRA.

The EPA's RSLs for Chemical Contaminants at Superfund Sites (EPA, 2012) were used to screen site data, with the exception of the fish and blue crab consumption pathways. The maximum detected concentrations in surface soil, sediment (direct contact pathways only), and surface water (direct contact pathways only) were compared to RSLs to identify COPCs for the HHRA. For the fish and blue crab consumption pathways, surface water and sediment samples were initially screened using the qualitative and quantitative approaches discussed in Section 2.2.1 of Appendix E. Based on the initial risk screening using modeled concentrations from sediment and surface water, four COPCs (lead, thallium, zinc, and PCBs) were identified as the primary risk drivers for the fish and blue crab consumption pathways. Therefore, measured fish and blue crab concentrations of these four analytes were used in a supplemental COPC screening process. Due to the lack of appropriate screening levels for biota samples, the measured constituents were identified as COPCs if they were detected in the biota samples.

The maximum detected concentrations in surface soil, sediment, surface water, blue crab, and fish were compared to representative background levels, as discussed in Section 2.2.2 of Appendix E. Although some inorganic chemicals were detected at concentrations less than the established background concentrations, inorganic chemicals were not eliminated as COPCs based on comparison to background for soil, surface water (direct contact pathways only), and sediment (direct contact pathways only). Inorganic chemicals detected in sediment and surface water at concentrations less than their respective background values were eliminated as COPCs for the fish and blue crab consumption pathways. This approach was approved by EPA Region 2 and the PREQB during the Vieques Technical Subcommittee Meeting held on October 26, 2011. Two inorganic chemicals (iron and mercury) in surface water and three inorganic chemicals (arsenic, hexavalent chromium, and mercury) in sediment were eliminated as COPCs for the fish and blue crab consumption pathways based on the background comparison. The following COPCs were identified for each environmental medium and receptor group:

Recreational Users/Trespassers/Site Visitors

- Seven metals (aluminum, arsenic, cobalt, iron, manganese, vanadium, and hexavalent chromium), Aroclor-1254, and two PAHs (benzo(a)pyrene and benzo(b)fluoranthene) were identified as COPCs in surface soil in the North Area for the direct contact exposure pathways.
- No COPCs were identified in the PCB Removal Area.
- Four metals (antimony, cadmium, thallium, and hexavalent chromium) were identified as COPCs in surface water for the direct contact exposure pathways.
- Ten metals (aluminum, antimony, arsenic, cobalt, iron, lead, manganese, thallium, vanadium, and hexavalent chromium), Aroclor-1254, and two PAHs (benzo(a)pyrene and benzo(b)fluoranthene) were identified as COPCs in sediment for the direct contact exposure pathways.

Residents

- Seven metals (aluminum, arsenic, cobalt, iron, manganese, vanadium, and hexavalent chromium), Aroclor-1254, and two PAHs (benzo(a)pyrene and benzo(b)fluoranthene) were identified as COPCs in surface soil in the North Area for the direct contact exposure pathways.

- No COPCs were identified in the PCB Removal Area.

Maintenance Workers/Industrial Workers/Construction Workers

- Arsenic was identified as a COPC in surface soil in the North Area for the direct contact exposure pathways.
- No COPCs were identified in the PCB Removal Area.

Fish Consumers/Blue Crab Consumers

- Seven metals (cadmium, chromium, copper, lead, nickel, silver, and zinc), three pesticides (4,4'-DDD, 4,4'-DDE, and 4,4'-DDT), PCBs, and one VOC (tetrachloroethene) were identified as COPCs in biota.

3.2 Exposure Evaluation

Potential current and future receptors were evaluated in the HHRA. As noted in Section 3.1 of Appendix E and in the conceptual model for potential human receptors (**Figure 3-1**; **Appendix E, Figure 1 of Attachment E-2 and Table 1 of Attachment E-1**), current/future receptors evaluated in the HHRA consisted of recreational users/trespassers/site visitors (adult, youth [6-16 years old], and child [1-6 years old]), fish consumers (adult, youth, and child), and blue crab consumers (adult, youth, and child). Maintenance workers, industrial workers, construction workers, and residents (adult and child) were identified as potential/hypothetical future receptors.

The following potential exposure pathways were quantified for potential receptors identified at SWMU 6.

- **Recreational Users/Trespassers/Site Visitors (Adult/Youth/Child; Potential Current/Future)**
  - ***Surface Soil (0-6 inches)*** - Ingestion, dermal contact, and inhalation.
  - ***Surface water*** - Ingestion and dermal contact.
  - ***Sediment*** - Ingestion and dermal contact.
- **Residents (Adult/Child; Hypothetical Future)**: Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-6 inches).
- **Maintenance Workers (Potential Future)**: Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-6 inches).
- **Industrial Workers (Hypothetical Future)**: Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-6 inches).
- **Construction Workers (Potential Future):** Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-6 inches).
- **Fish Consumers (Adult/Youth/Child; Potential Current/Future)**: Ingestion of fish.
- **Blue Crab Consumers (Adult/Youth/Child; Potential Current/Future):** Ingestion of blue crab.

Evaluation of the fish and blue crab consumption pathways was conducted using an agency-approved site-specific ingestion frequency of two fish or blue crab meals per week. However, based on observations made during the biota sampling event when the areal extent of the shallow lagoon was readily accessed for fishing/crabbing over a 2-day period, it appears that the vast majority of edible size fish/blue crabs that were present in the lagoon were caught, primarily within the first day. Therefore, it became apparent that this ingestion frequency was overly conservative due to the very small number of edible-size fish and blue crab present in the lagoon (4 snook, 5 mullet, and 5 blue crab), and the physical nature of the lagoon. The area of open water in the SWMU 6 lagoon is small (0.6 acre), the water depth is shallow (approximately 1 foot average based on measurements made while wading across the areal extent of the lagoon), and the current hydrologic connection to the Kiani Lagoon complex is constricted (approximately 3 feet wide and 1 foot deep) and mostly filled by a dense growth of red mangrove prop roots. These roots create an effective, natural barrier to large fish, allowing only small, young fish or crab to pass into the SWMU 6 lagoon. Therefore, the lagoon does not support a large population of edible-size fish or blue crab. Upon entering the lagoon, a juvenile fish or crab would require an additional 6 to 12 months to reach an edible size. In the future, due to natural processes, the opening to the lagoon will likely become completely

overgrown by mangrove roots and blocked by sedimentation, resulting in an even smaller population of edible-size fish and blue crab in the lagoon. Therefore, a more realistic site-specific ingestion frequency of one meal per month was evaluated and included in the uncertainty analysis of the HHRA.

A hot spot evaluation was conducted for soil, sediment, and surface water at SWMU 6 to determine if any areas at SWMU 6 may require a separate exposure evaluation. The detected concentrations were compared to 10 times the adjusted industrial soil and tapwater RSLs (i.e., resulting in an HQ = 1.0 and ELCR of $1x10^{-5}$) to determine the presence (if any) of a discrete area where concentrations are considerably higher than those present in the surrounding area. Detected concentrations of arsenic at three sediment sample locations, chromium (VI) at four sediment sample locations, and thallium at one sediment location exceeded 10 times their respective residential soil RSLs. All four of the COPCs identified in surface water (antimony, cadmium, chromium (VI), and thallium) exceeded 10 times their respective RSLs. As discussed in Section 2.3 of Appendix E, a graphical review of the soil, sediment, and surface water data indicates that the detected concentrations are distributed relatively evenly without any discrete area of elevated concentrations. Therefore, it was concluded that no discrete hot spots are present that warrant a separate risk evaluation.

3.3 Risk Estimates

EPA's target (acceptable) range for excess lifetime cancer risk (ELCR) associated with CERCLA sites is 1-in-10,000 ($1x10^{-4}$) to 1-in-1,000,000 ($1x10^{-6}$). Similarly, the target (acceptable) non-cancer hazard index (HI) is 1.0 or less per target organ. Risk estimates were calculated for potential receptors and exposure pathways using conservative assumptions for exposure factors and exposure point concentrations, as discussed in Section 3.2 of Appendix E. The equations used to estimate potential non-carcinogenic, carcinogenic, and mutagenic effects are provided in Sections 5.1, 5.2, and 5.3 of Appendix E, respectively. The EPA's Adult Lead Methodology (ALM) and Integrated Exposure Uptake Biokinetic (IEUBK) Model were used to evaluate potential site-specific exposures to lead, as discussed in Section 4.4 of Appendix E (EPA, 2009b; 2010).

- **Recreational Users/Trespassers/Site Visitors – Potential Current/Future Scenario**
  - Adult - $2x10^{-4}$ cumulative ELCR; $1x10^{-6}$ ELCR for soil; $2x10^{-4}$ ELCR for surface water; $3x10^{-6}$ ELCR for sediment. All target organ-specific HIs<1.0 for soil and sediment; one target organ-specific HI>1.0 for surface water (hair [6] due to thallium)
  - Youth - $3x10^{-4}$ cumulative ELCR; $1x10^{-6}$ ELCR for soil; $3x10^{-4}$ ELCR for surface water; $3x10^{-6}$ ELCR for sediment. All target organ-specific HIs<1.0 for soil and sediment; one target organ-specific HI>1.0 for surface water (hair [8] due to thallium)
  - Child - $5x10^{-4}$ cumulative ELCR; $7x10^{-6}$ ELCR for soil; $5x10^{-4}$ ELCR for surface water; $7x10^{-6}$ ELCR for sediment. All target organ-specific HIs<1.0 for soil and sediment; one target organ-specific HI>1.0 for surface water (hair [15] due to thallium)
  - The probability of blood lead levels (BLLs) exceeding 10 µg/dL due to potential exposure to lead in sediment is < 5% for adult and child recreational users/trespassers/site visitors
- **Residents – Hypothetical Future Scenario**
  - Adult - All target organ HIs<1.0
  - Child - All target organ HIs<1.0
  - Adult/Child - $3x10^{-5}$ cumulative ELCR
- **Maintenance Workers – Potential Future Scenario**
  - Cumulative ELCR <1x10-6 and all target organ-specific HIs<1.0
- **Construction Workers – Potential Future Scenario**
  - Cumulative ELCR <$1x10^{-6}$ and all target organ-specific HIs<1.0

- **Industrial Workers – Hypothetical Future Scenario**
  - $1x10^{-6}$ cumulative ELCR and all target organ-specific HIs<1.0
- **Fish Consumers – Potential Current/Future Scenario**
  - Adult - $1x10^{-3}$ cumulative ELCR and three target organ-specific HIs>1 (reproduction [26] due to dioxin-like PCBs in fish, and eyes [31] and finger nails [33] due to non-dioxin-like PCBs in fish)
  - Youth - $1x10^{-3}$ cumulative ELCR and three target organ-specific HIs>1 (reproduction [47] due to dioxin-like PCBs in fish and eyes [55] and finger nails [55] due to non-dioxin-like PCBs in fish)
  - Child - $8x10^{-4}$ cumulative ELCR and three target organ-specific HIs>1 (reproduction [61] due to dioxin-like PCBs in fish, and eyes [47] and finger nails [47] due to non-dioxin-like PCBs in fish)
  - The probability of BLLs exceeding 10 µg/dL is less than 5% for adult and child consumers
- **Blue Crab Consumers – Potential Current/Future Scenario**
  - Adult - $3x10^{-4}$ ELCR and three target organ-specific HIs>1 (reproduction [3] due to dioxin-like PCBs in blue crab, and eyes [3] and finger nails [3] due to non-dioxin-like PCBs in blue crab)
  - Youth - $2x10^{-4}$ ELCR and three target organ-specific HIs>1 (reproduction [5] due to dioxin-like PCBs in blue crab, and eyes [5] and finger nails [5] due to non-dioxin-like PCBs in blue crab)
  - Child - $2x10^{-4}$ ELCR and three target organ-specific HIs>1 (reproduction [6] due to dioxin-like PCBs in blue crab and eyes [7] and finger nails [7] due to non-dioxin-like PCBs in blue crab).
  - The probability of BLLs exceeding 10 µg/dL is above 5% for adult consumers and but less than 5% for child consumers

3.4 Chemicals of Concern

Chemicals of concern (COCs) are identified when the potential ELCR or HI for a receptor group exceeds EPA threshold values (a total ELCR of $1x10^{-4}$ or a target organ-specific HI of 1) and concentrations are site-related and above background levels. For each receptor group, when a potential ELCR of $1x10^{-4}$ was exceeded for an environmental medium, the COPCs above background levels and posing an individual ELCR greater than $1x10^{-6}$ in that environmental medium were identified as COCs. When a potential target organ-specific HI exceeded 1 for an environmental medium, the COPCs above background levels and posing a hazard quotient (HQ) greater than 0.10 for the target organ in that environmental medium were identified as COCs. Factors such as nature of contamination source, laboratory contamination, common pesticide use (unrelated to spills, improper storage disposal or use), and the realistic size of the site fish/blue crab population were also considered when identifying COCs.

The receptors with risk estimates exceeding EPA threshold values are presented below, and the environmental medium and COPCs responsible for the unacceptable risks are indicated:

- Recreational Users/Trespassers/Site Visitors (Adult, Youth, and Child)
  - Surface water (driven by hexavalent chromium and thallium)
- Fish Consumers (Adult, Youth, and Child)
  - Fish (driven by 4,4'-DDE, dioxin-like PCBs, and non-dioxin-like PCBs)
- Blue Crab Consumers (Adult, Youth, and Child)
  - Blue crab (driven by 4,4'-DDD, 4,4'-DDE, dioxin-like PCBs, and non-dioxin-like PCBs [in all three age groups], and lead (adult consumers only)

Hexavalent Chromium in Surface Water

As indicated in Section 2.2.2 of Appendix E, the maximum detected onsite surface water concentration of hexavalent chromium was less than the background surface water concentration. Based on this, the presence of

hexavalent chromium in SWMU 6 surface water is attributable to background; therefore, hexavalent chromium was not identified as a COC.

Thallium in Surface Water

Thallium in surface water is not likely site-related and is not identified as a COC for the following reasons:

- It was detected in only one of five surface water samples (location VWW06-SW003, at the northern end of the lagoon) and one of seven sediment samples (location VWW06-SD005, at the southeastern end of the lagoon). Thallium was not detected in soil or biota at the site. If thallium was site-related, it would likely be detected in multiple soil, sediment, and surface water samples and potentially in site-related biota.
- Over the exposure duration, human receptors would be exposed to more concentrations than the maximum detected concentration and would pass through other, lower concentrations in the lagoon to access location VWW06-SW003.
- Thallium was not identified as a COC in other media at SWMU 6.
- The total uncertainty factor associated with the oral RfD is 3000 (10 for interspecies extrapolation, 10 for intraspecies extrapolation, 3 for extrapolation from a subchronic to chronic study, and 10 for database deficiencies). Due to the use of multiple uncertainty factors, the RfD for thallium likely results in a conservative estimate of potential non-carcinogenic hazards.

4,4'-DDD and 4,4'-DDE in Fish and/or Blue Crab

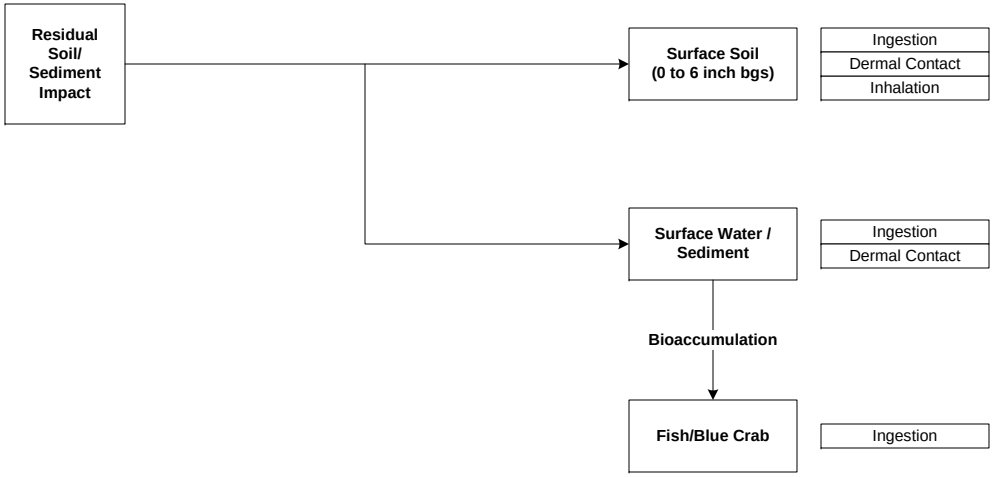
Pesticides are present in environmental media as a result of application to control pests. This type of regulated and approved pesticide use is distinct from pesticide contamination that is the result of a spill, improper storage, disposal, or use, and concentrations are not required to be remediated. The concentrations of pesticides detected in SWMU 6 media are consistent with concentrations detected across multiple sites on west Vieques (see Appendix X of the SWMU 4 RI/FS Report and Appendix I of this FS Report) and attributed to normal pesticide application (CH2M HILL, 2012b). Therefore, 4,4'-DDD and 4,4'-DDE were not identified as COCs.

Lead in Blue Crab

The blue crab consumption frequency (2 meals/week from SWMU 6) used in the HHRA yielded risk estimates above target levels for adult blue crab consumers. As previously discussed in Section 3.3, an ingestion frequency of 2 meals per week was considered to be overly conservative due to the very small number of edible-size fish and blue crab in the lagoon and the physical nature of the lagoon. Additionally, if fish or blue crab consumers attempted to fish or crab at the SWMU 6 lagoon more than once a month, they would likely be unsuccessful in catching fish or crab and go elsewhere, such as adjacent Kiani Lagoon. Kiani Lagoon is a larger water body that supports more and larger fish, providing more opportunities for repeated successful fishing. An exposure frequency of 1 meal/month is considered more representative of site conditions and a more realistic, sustainable ingestion rate for the lagoon. Based on this more realistic exposure assumption, the probability of BLL exceeding 10 µg/dL due to potential exposure to lead in blue crab is less than 5%. Therefore, lead was not identified as a COC in blue crab.

PCBs in Fish and Blue Crab

PCBs in fish and blue crab were identified as COCs at SWMU 6.



Primary Source	Primary Release Mechanism	Secondary Source	Secondary Release Mechanism	Exposure Media	Exposure Route	Potential Human Receptors										
						Current/Future						Future				
						Recreational User/ Trespasser/ Site Visitor			Fish/Blue Crab Consumer			Maintenance Worker	Industrial Worker	Construction Worker	Residential	
						Adult	Youth	Child	Adult	Youth	Child				Adult	Child
Residual Soil/ Sediment Impact				Surface Soil (0 to 6 inch bgs)	Ingestion	X	X	X				X	X	X	X	X
					Dermal Contact	X	X	X				X	X	X	X	X
					Inhalation	X	X	X				X	X	X	X	X
				Surface Water / Sediment	Ingestion	X	X	X								
					Dermal Contact	X	X	X								
				Fish/Blue Crab	Ingestion				X	X	X					

Legend
X – Potentially complete exposure pathways identified

Figure 3-1
Conceptual Model for HHRA
SWMU 6
Vieques, Puerto Rico

SECTION 4

Post-Removal Ecological Risk Assessment Summary

A screening ecological risk assessment (SERA), constituting Steps 1 and 2 of the ecological risk assessment (ERA) process, and the first step (Step 3A) of a baseline ecological risk assessment (BERA), were conducted for SWMU 6 using analytical data collected after the completion of the removal action. The complete post-removal ERA is presented in **Appendix F** of this FS Report. This section summarizes the key components and findings of the post-removal ERA.

4.1 ERA Process and Objectives

The approach, methods, and assumptions used for this ERA were based upon the final ERA protocol presented in the *Master Standard Operating Procedures, Protocols, and Plans* (CH2M HILL, 2010b), the *Master Ecological Risk Assessment Protocol for Vieques Environmental Restoration Program – Update 1 (Addendum)* (CH2M HILL, 2010c), the ERA interim deliverable for the SWMU 6 (CH2M HILL, 2011b), and regulator comments on the interim deliverable. The ERA was conducted in accordance with the *Navy Policy for Conducting Ecological Risk Assessments* (CNO, 1999) and the Navy guidance for implementing this ERA policy (NAVFAC, 2003). These guidance documents describe a process consisting of eight steps, of which Steps 1 through 3A were conducted for this ERA. Steps 1 and 2 of the ERA process comprise the SERA, which are conducted using intentionally conservative assumptions. If the results of the SERA indicate that unacceptable risks are possible, the site normally continues on to Step 3A, the first step in the BERA.

The objectives of a SERA are to:

- Determine if potential risks to ecological receptors warrant either: (1) additional assessment beyond the conservative screening steps of the ERA process (unacceptable ecological risks are possible); or (2) the removal of the site from further ecological consideration (no unacceptable ecological risks likely).
- Focus subsequent steps of the ERA process on the specific chemicals, pathways, and receptors of potential concern if unacceptable ecological risks are possible.
- Identify any data gaps or areas of unacceptable uncertainty that may require the collection of additional data to support ERA evaluations beyond the screening level.

The general objectives of a Step 3A ERA are to:

- Refine the risk estimates from the SERA to determine if risks to ecological receptors from site-related chemicals are likely to be unacceptable based upon realistic exposure scenarios.
- Focus subsequent data collection activities if potentially unacceptable risks are indicated, uncertainties are unacceptably high, and/or data gaps are identified.

4.2 Ecological Setting

SWMU 6, the Former Mangrove Disposal Site, is located in a mangrove swamp between two tidally influenced lagoons of the Laguna Kiani complex (Laguna Kiani and Laguna El Pobre), along Highway 200 on the former NASD. Excavation activities resulted in the ecological setting changing from an estuarine, intertidal, forested wetland dominated by black mangrove to a shallow, open water lagoon (SWMU 6 lagoon) that is hydraulically connected to, and tidally influenced by, the adjacent Laguna Kiani complex (Laguna Kiani and Laguna El Pobre). The site now supports a relatively small and diverse community of marine fish, macroinvertebrates (such as blue crabs, hermit crabs, fiddler crabs, and mollusks), foraging wildlife (such as wading birds), and recently planted and naturally established mangroves. Limited upland habitat occurs at the southern fringe of SWMU 6, primarily in association with the elevated roadbed supporting Highway 200.

The topography of SWMU 6 is relatively flat since it occurs within the low-lying coastal zone of sedimentary deposits that occupy the northwest corner of the island. The site is hydraulically connected to the Vieques

Passage approximately 800 feet to the north via the Laguna Kiani complex, and therefore experiences daily tidal cycles that can average about 0.6 foot. Water depth within the SWMU 6 lagoon averages about 1 foot, with the deepest point in the middle (up to 3 feet). Water parameters, as measured on February 3, 2011, indicated a mean salinity of 31.1 parts per thousand (ppt), and mean dissolved oxygen (DO) of 5.1 milligrams per liter (mg/L) within the SWMU 6 lagoon. Typically, the SWMU 6 lagoon contains about 0.4 acre of open water, along with about 0.1 acre of intertidal mudflat. A small area (approximately 1,500 square feet) of disturbed upland occurs at the southeastern corner of SWMU 6.

Prior to NTCRA debris and soil excavation activities, SWMU 6 was vegetated with mangroves, with black mangrove (*Avicennia germinans*) occurring across the more elevated interior of the site and red mangrove (*Rhizophora mangle*) occurring along the more permanently inundated western and northern boundaries. Excavation activities resulted in the removal of the interior mangroves and the lowering of the site elevation such that the area is now fully inundated at high tide. Under current conditions, a dense stand of black and red mangroves outlines the newly formed lagoon, except for the southern border along Highway 200, which is mostly unvegetated. This southern border is predominantly a 10 to 15 foot sloped roadside buffer, much of which is covered by a fibrous erosion control fabric (the result of a recent road and bridge improvement project), and along which herbaceous ground cover is becoming established, currently at about 5 to 10 percent cover. Red mangrove seedlings were planted by USFWS in 2009 (following the NTCRA) throughout the intertidal zone and have been growing rapidly. In addition, an abundance of black mangrove seedlings and a few red mangrove seedlings have become naturally established in this zone. No other submergent or emergent aquatic vegetation was observed in this newly formed lagoon.

The hydrologic connection at the north side of the SWMU 6 lagoon is shallow (less than 1 foot), narrow (about 2-3 feet wide, depending on tide elevation), and heavily vegetated with a dense strip of red mangrove about 10 feet wide. Over time this connection will likely close naturally by the combination of increasing red mangrove prop-root density and associated sediment accumulation around the root structures. The offsite Laguna Kiani complex lobe immediately north of the vegetated strip is shallow (average 1.7 feet), small (approximately 0.1 acre), and contains a sparse stand of turtle grass (*Thalassia testudinum*). The small, disturbed upland portion of SWMU 6 contains a few plant species including various grasses, tropical sedge (*Fimbristylis cymosa*), seaside purslane (*Sesuvium portulacastrum*), and *Acacia spp*.

The shallow, open lagoon habitat at SWMU 6 currently contains a variety of fish and macroinvertebrates. Fish observed or captured include white mullet (*Mugil curema*), snook (*Centropomus undecimalis*), mangrove snapper (*Lutjanus griseus*), bigeye mojarra (*Eucinostomus havana*), and checkered puffer (*Sphoeroides testudineus*). Other fish species have been observed but not captured. Based on observations in nearby similar habitats, additional fish likely present include spotfin mojarra (*Eucinostomus argenteus*), striped mojarra (*Diapterus plumieri*), bigeye anchovy (*Anchoa lamprotaenia*), crested goby (*Lophiogobius cyprinoides*), and redfin needlefish (*Strongylura notata*). The small and heavily vegetated hydrologic connection on the north side limits the movement of most large fish specimens between the SWMU 6 lagoon and adjacent Kiani lagoon. As a result, the numbers of large game fish such as snook are low in the SWMU 6 lagoon. However, juvenile fish and other small species (e.g., mojarra, anchovies) can more readily access this lagoon area and occur in larger numbers. Common macroinvertebrates collected have included blue crab (*Callinectes sapidus*), Caribbean fiddler crab (*Uca rapax*), grass shrimp (*Palaeomonetes* sp.), an unknown species of hermit crab, coffee bean snail (*Melampus coffeus*), and upside-down jellyfish (*Cassiopeia xamachana*). Other benthic macroinvertebrates that may occur, though not directly observed during qualitative collection activities, include various polychaetes, sponges, tunicates, amphipods, barnacles, and other species of crabs and mollusks. There are no known occurrences of federally listed species.

4.3 Analytical Data Used in the ERA

Onsite SWMU 6 samples evaluated in the post-removal ERA comprised those collected from five marine surface water and eight marine sediment stations within the SWMU 6 lagoon (North Area), and two surface soil stations in the upland fringe at the southeastern corner of the North Area. These stations all occurred within the area previously disturbed by debris and soil removal activities, on the north side of Highway 200. Offsite marine

surface water and sediment samples were collected at two stations (SW/SD001 and SW/SD002) within a lobe off of the Laguna Kiani complex where SWMU 6 connects with the Laguna Kiani complex. These offsite stations represent an area for evaluating potential transport of constituents of interest from SWMU 6. Confirmatory samples SS012 and SS013 were collected at the PCB Removal Area to verify the effectiveness of recent (February 2011) PCB-contaminated soil removal. The action included the removal of 12 inches of surface soil, and resulted in two shallow depressions partially filled with water and surrounded by mangrove trees and an abundance of fiddler crab burrows. As a result, the confirmatory medium sampled at these locations was considered marine sediment for this ERA and evaluated separately from the marine sediments on the north side of Highway 200 because of their isolated nature.

Ten background marine surface water and sediment samples were collected from nearby lagoons with similar aquatic settings to the SWMU 6 lagoon: (1) three from Laguna Kiani (SW/SD018 through SW/SD020); (2) three from Laguna El Pobre (SW/SD021 through SW/SD023); and (3) four from Laguna Punta Arenas (SW/SD014 through SW/SD017), which is located approximately 0.5 miles west of the site, adjacent to Highway 200. Background samples were analyzed for inorganic constituents and pesticides, and were considered in the risk characterization portion of the post-removal ERA.

4.4 ERA Results

This section summarizes the results of the post-removal ERA. The pathways and receptors evaluated are shown in the conceptual model for ERA **(Figure 4-1)**. A more detailed description of the ERA results is provided in the complete ERA in **Appendix F**.

4.4.1 Aquatic Habitats – SWMU 6 Lagoon

Six assessment endpoints were developed for the SWMU 6 lagoon. Lines of evidence for the lagoon included: (1) comparison of surface water and surface sediment concentrations with ESVs; (2) comparison of site surface water and surface sediment concentrations with background concentrations; and (3) comparison of modeled dietary doses with ingestion TRVs.

In surface water, two metals (aluminum and iron) were identified as Step 3A chemicals of potential concern (COPCs) in the SWMU 6 lagoon. Neither of these metals was a Step 2 COPC in lagoon sediment, and both are likely attributable to background; maximum concentrations of aluminum and iron in the two North Area soil samples were less than the maximum background values for West Vieques surface soil. Thus, neither chemical has a likely site-related source. No marine ecological screening value (ESV) was available for aluminum, so a freshwater ESV was used; this freshwater value is influenced by pH and may overestimate potential risks in marine waters (which tend to have higher pH values than freshwater). The total iron concentrations in surface water were consistent with background. Also, the marine ESV for iron in the final ERA protocol (50 µg/L) was from a secondary source (Buchman, 2008). Consulting the primary source cited in Buchman (2008), British Columbia Ambient Aquatic Life Guidelines, indicated that the current document (March 2008) concludes that there are insufficient data to develop a marine-based value for iron. The freshwater value for dissolved iron (350 µg/L) from this reference is higher than the maximum detected concentration in the lagoon (293 µg/L). Based upon this evaluation, no COCs were identified in lagoon surface water.

In sediment, five metals (cadmium, copper, lead, thallium, and zinc) and two VOCs (2-butanone and carbon disulfide) were identified as Step 3A COPCs. The maximum HQs for cadmium and copper were 4.74 and 6.00, respectively, and the mean HQs were 1.93 and 2.27, respectively, based upon the ER-L. Neither metal exceeded the ER-M (9.80 mg/kg for cadmium and 270 mg/kg for copper). The maximum HQs for lead and zinc were 13.1 and 5.66, respectively, and the mean HQs were 4.39 and 1.83, respectively, based upon the ER-L. Both metals exceeded the ER-M (218 mg/kg for lead and 410 mg/kg for zinc) in at least one sample, at maximum ratios of 2.81 for lead and 2.07 for zinc. Cadmium, copper, lead, and zinc are all acid volatile sulfide (AVS) metals; that is, the bioavailability of these metals is thought to be highly influenced by the amount of sulfides in the sediment. Seven of the eight SEM/AVS ratios (SEM/AVS ratios provide an indication of the bioavailability of AVS metals) measured in the SWMU 6 lagoon exceeded one, suggesting that these metals are currently bioavailable. Thus, these metals, particularly lead and zinc, may potentially impact lower trophic level receptors in the SWMU 6 lagoon. When

compared with the two samples collected in 2011 from the Laguna Kiani complex lobe just outside of the SWMU 6 lagoon (the sediment of which was not removed during the NTCRA), 2011 sediment samples in the SWMU 6 lagoon had lower concentrations of total organic carbon (TOC), slightly higher values for pH, reduced levels of sulfides (resulting in higher SEM/AVS ratios), and generally lower percentages of fines (silt/clay). It is likely that these differences are related to the removal action and suggest that the SWMU 6 lagoon has not yet reached post-removal equilibrium.

In sediment, thallium was detected in only 1 of 8 samples, with the one detection occurring at about three times the background concentration (there was no ESV for this metal). However, the low frequency of detection for this metal suggests that it is unlikely to contribute significantly to ecological risks in the SWMU 6 lagoon. Thus, thallium was not identified as a COC in sediment.

2-Butanone and carbon disulfide were identified as Step 3A sediment COPCs because they were detected but ESVs and background upper tolerance limits (UTLs) were not available. The maximum detected sediment concentration of 2-butanone (47.3 µg/kg) was less than TOC-adjusted freshwater equilibrium partitioning (EqP) values (524 µg/kg; Jones et al., 1997). Carbon disulfide, which can be naturally produced in wetlands by microbes adapted to low oxygen conditions (along with several other sulfur compounds such as hydrogen sulfide), exceeded a comparable EqP value (1.65 µg/kg; Jones et al., 1997) but was detected in only 3 of 8 site sediment samples. For these reasons, neither of these VOCs was identified as a COC in sediment.

Based upon the above evaluation, cadmium, copper, lead, and zinc were identified as COCs in SWMU 6 lagoon sediment.

For aquatic food web exposures in the SWMU 6 lagoon, both copper and lead had HQs that exceeded one based upon the Maximum Acceptable Toxicant Concentration (MATC), the threshold for a potential adverse effect in the ERA protocol. The HQ based upon the Lowest Observed Adverse Effect Level (LOAEL) also exceeded one for copper. The MATC-based HQ for copper (spotted sandpiper) was low (1.87) and the LOAEL-based HQ was only slightly above one (1.08). For lead, the MATC-based HQ (also for the spotted sandpiper) was just slightly above one (1.04) and the LOAEL-based HQ was less than one (0.47). Typically, the SWMU 6 lagoon contains about 0.4 acre of open water, along with about 0.1 acre of intertidal mudflat. Spotted sandpiper foraging at the site would generally be limited to the mudflat habitat. The home range for the spotted sandpiper is variable and larger than found at SWMU 6, reported as a mean of about 0.6 acres (Maxson and Oring, 1980) and 12 acres (Miller and Miller, 1948), and as 2.5, 4.5 and 8.0 acres for individually tracked birds (Hays, 1972). The spotted sandpiper is an indicator species representative of the avian invertivore foraging guild within the project area that includes other shorebird species such as the least sandpiper, semipalmated plover, black-necked stilt, and black-bellied plover, all of which may forage along the intertidal habitat and/or within the shallow water fringe of the lagoon. Although an area use factor (AUF) of one was assumed in the ERA, the available habitat within the site boundary would not provide sufficient forage for this receptor. Thus, its potential exposure at the site is unlikely to result in unacceptable risks given the magnitude of the risk estimates (assuming an AUF of one). For this reason, neither copper nor lead was considered a COC for aquatic food web exposures at the site.

In addition, mean concentrations of the metals (lead and zinc) and PCBs detected in blue crab and fish (mullet and snook) tissue samples collected for evaluation of potential human exposures were entered into the aquatic food web models (see Appendix F, Attachment D). Food web receptors included the spotted sandpiper, green heron, and fishing bat, all of which normally consume small prey items such as polychaetes, fiddler crabs, and small fish (< 3 inches). The analyzed organisms, which included whole body crabs (average 4 inch carapace width) and whole body (gutted) fish (average 11 inches total length), do not represent typical prey items for these wildlife receptors primarily because of their large sizes. Considering this uncertainty, site specific tissue data can be more representative of actual exposure relative to modeled dietary concentrations. The same aquatic food web models used in the ERA (Appendix F) were used for this tissue evaluation except that mean blue crab concentrations were substituted for modeled mean benthic invertebrate concentrations and mean fish concentrations (both species combined) were substituted for modeled fish concentrations.

Results of the food web models indicated only lead had an MATC-based HQ that exceeded one (HQ=1.03) for the spotted sandpiper, the defined threshold for a potential adverse effect in the final ERA protocol, although the HQ

based upon the LOAEL was less than one for lead. For the spotted sandpiper, lead exposure at the site is unlikely to result in unacceptable risk given the low magnitude of the risk estimate. For the green heron, HQs based on NOAEL, MATC, and LOAEL TRVs were all less than one. The fishing bat had a NOAEL-based HQ of 1.9 for dioxin-like PCBs (TEQ), but MATC and LOAEL-based HQs were less than one; HQs for all other parameters were less than one. This additional evaluation of tissue data collected to support potential HHRA exposure scenarios did not result in any changes to the above conclusions of the ERA.

In conclusion, cadmium, copper, lead, and zinc were identified as COCs in SWMU 6 lagoon sediment for direct exposures to lower trophic level receptors. Risks were determined to be acceptable for surface water and food web exposures.

4.4.2 Aquatic Habitats – Laguna Kiani Complex Lobe

Two assessment endpoints were developed for lower trophic level receptors in the Laguna Kiani complex lobe area. Lines of evidence included: (1) comparison of surface water and surface sediment concentrations with ESVs; and (2) comparison of site surface water and surface sediment concentrations with background concentrations.

In surface water, iron was identified as a Step 3A COPC in the lobe area. Iron was not a Step 2 COPC in lobe sediment. The total iron concentrations in surface water were consistent with background. Also, the marine ESV for iron in the final ERA protocol (50 µg/L) was from a secondary source (Buchman, 2008). Consulting the primary source cited in Buchman (2008), British Columbia Ambient Aquatic Life Guidelines, indicated that the current document (March 2008) concludes that there are insufficient data to develop a marine-based value for iron. The freshwater value for dissolved iron (350 µg/L) from this reference is higher than the maximum detected concentration in the lobe (318 µg/L). Based upon this evaluation, no COCs were identified in lobe surface water.

In sediment, two VOCs (2-butanone and carbon disulfide) were identified as Step 3A COPCs in lobe sediment because they were detected but ESVs and background UTLs were not available. The maximum detected concentration of 2-butanone (30.5 µg/kg) was less than TOC-adjusted freshwater EqP values (524 µg/kg; Jones et al., 1997). Carbon disulfide, which can be naturally produced in wetlands by microbes adapted to low oxygen conditions (along with several other sulfur compounds such as hydrogen sulfide), exceeded a comparable EqP value (1.65 µg/kg; Jones et al., 1997). For these reasons, neither of these VOCs was identified as a COC. Based upon this evaluation, no COCs were identified in lobe sediment.

In conclusion, no unacceptable risks were identified for aquatic receptors associated with the Laguna Kiani complex lobe. In addition, a review of data from these stations indicates that detected concentrations are comparable to background levels, and therefore not impacted by SWMU 6-related sources.

4.4.3 Aquatic Habitats – PCB Removal Areas

Two assessment endpoints were developed for lower trophic level receptors in the PCB Removal Area. Lines of evidence included a comparison of surface sediment concentrations with sediment ESVs. None of the mean HQs for the PCBs exceeded one. Thus, no COCs were identified for the PCB removal areas and ecological risks there are acceptable.

4.4.4 Terrestrial Habitats

Three assessment endpoints were developed for terrestrial habitats at SWMU 6. Lines of evidence for terrestrial habitats included: (1) comparison of site surface soil concentrations with ESVs; and (2) comparison of site surface soil concentrations with background concentrations.

Three metals (manganese, iron, and hexavalent chromium) were identified as Step 3A COPCs in surface soil. Manganese was detected in both site surface soil samples, but occurred above background in only one of the two samples, at a ratio of 2.53. The mean HQ for manganese was relatively low at 2.63. The manganese ESV used in the evaluation is the EPA Eco-SSL value protective of plants; however, considering the Eco-SSL value protective of soil invertebrates (450 mg/kg), the mean HQ would be 1.29. Iron was identified as a COPC because soil pH exceeded the acceptable range. However, the mean iron concentration at the site (22,050 mg/kg) only slightly exceeded the background UTL for soil type Qs (18,000 mg/kg), resulting in a ratio of 1.2. Based on the low magnitude of exceedance of ESVs and/or background, manganese and iron were not identified as COCs in soil.

Total chromium concentrations (maximum of 24.6 mg/kg, in the one surface soil sample from 2009) were well below soil ESVs (64.0 mg/kg) and background UTLs (48.0 mg/kg). Concentrations of total chromium in the one 2011 sample (6.60 mg/kg) were even lower. Hexavalent chromium was measured in the 2011 sample (2.38 mg/kg), but not in the 2009 sample, and comprised about one-third of the total chromium. Hexavalent chromium was not measured in background soil samples. However, concentrations of up to 150 mg/kg were measured in background sediment samples and hexavalent chromium typically exceeded total chromium concentrations in these background sediment samples, by more than an order of magnitude in some instances. This suggests that the analytical method used overestimated the hexavalent fraction. Since the HQ for hexavalent chromium in site surface soil samples was approximately six, and the overestimation is likely to be by a larger factor, hexavalent chromium is not likely to be present in site surface soil at levels that exceed ESVs and/or background. Thus, hexavalent chromium was not identified as a COC.

Acetone and TPH (diesel range) were detected in site surface soil samples but could not be evaluated quantitatively because ESVs were not available. However, the maximum concentration of acetone (4.60 µg/kg) was less than ESVs for the other 35 VOCs with available ESVs (which ranged from 6.80 to 64,000 µg/kg, with a median of 1,280 µg/kg and an average of 5,819 µg/kg). Thus, acetone was not identified as a COC. There are no available soil ESVs for TPH. However, PAHs (which are typically the most toxic fraction of the TPH) did not exceed ESVs in surface soil samples. Thus, TPH was not identified as a COC.

In conclusion, no unacceptable risks were identified for terrestrial receptors associated with the remaining upland portion of SWMU 6.

4.5 ERA Summary and Conclusions

Based upon the above evaluation, cadmium, copper, lead, and zinc were identified as COCs in SWMU 6 lagoon sediment for direct exposures to lower trophic level receptors. No COCs were identified for surface soil, surface water (all areas), surface sediment in the Laguna Kiani complex lobe area, or surface sediment in the PCB removal areas at SWMU 6. Similarly, no COCs were identified for aquatic food web exposures in the SWMU 6 lagoon. Thus, risks to ecological receptors are acceptable for all areas, media, and exposure pathways except for SWMU 6 lagoon sediment, as noted above.

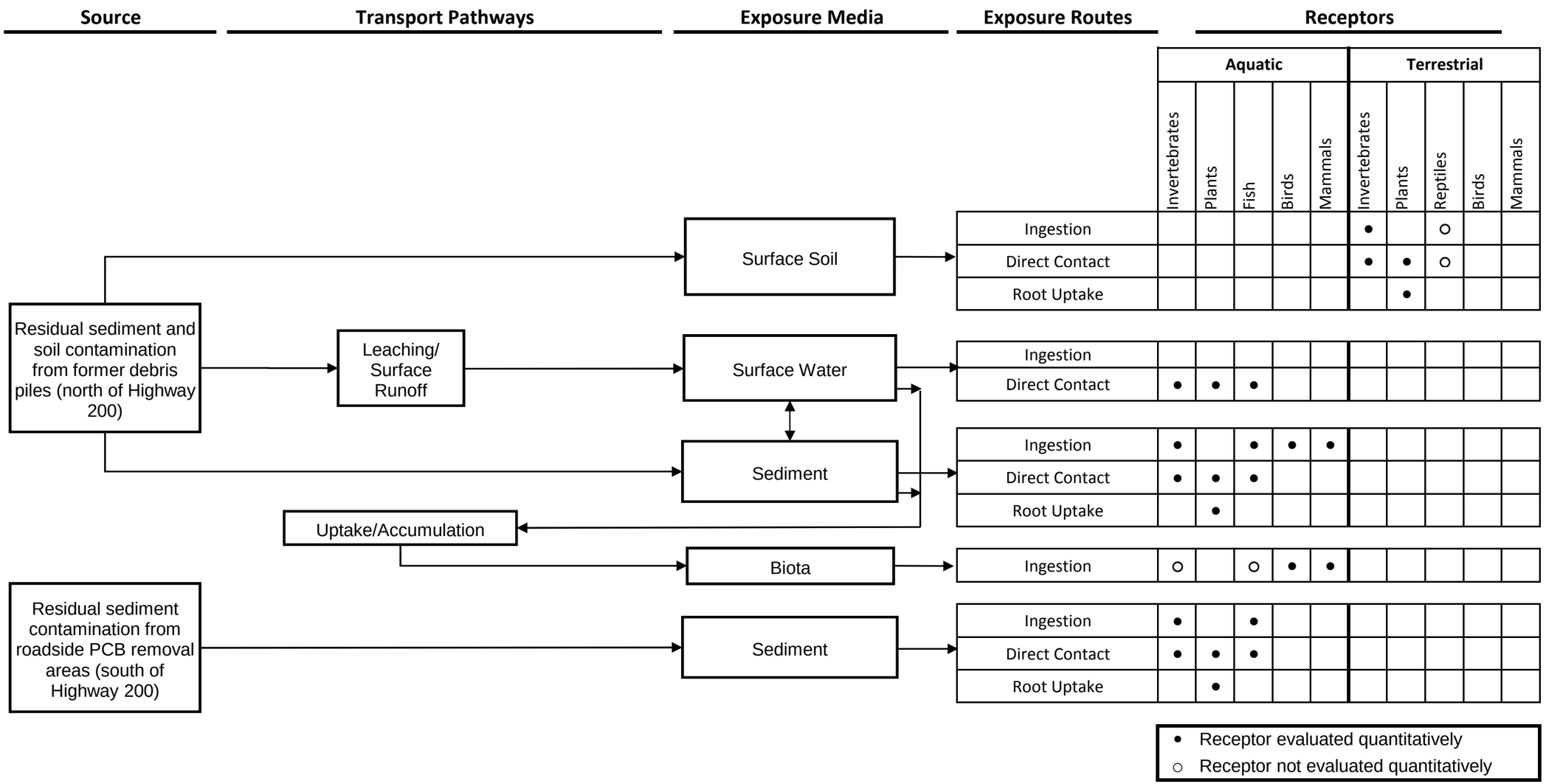


Figure 4-1

Conceptual Model for ERA

SWMU 6, Vieques, Puerto Rico

SECTION 5

Identification and Screening of Technologies

This section discusses the ARARs, RAOs, performance criteria, and the initial steps to develop remedial alternatives including the identification of general response actions (GRAs) and screening of potential remedial technologies at SWMU 6.

The FS was prepared in general accordance with the following guidance documents:

- Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, 1988).
- Contaminated Sediment Remediation Guidance for Hazardous Waste Sites (USEPA, 2005).
- Consideration of Green and Sustainable Remediation Practices in the Defense Environmental Restoration Program (DoD, 2009).
- National Oil and Hazardous Substances Pollution National Contingency Plan (NCP).
- Section 120 of CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA).

5.1 Applicable or Relevant and Appropriate Requirements

CERCLA remedial actions must meet ARARs for selected remedies unless a specific ARAR waiver is requested. ARARs are federal and state (commonwealth) public health and environmental requirements used to define the extent of site cleanup, identify sensitive land areas or land uses, develop remedial alternatives, and direct site remediation.

Applicable requirements are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state (commonwealth) law that address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at the site.

Relevant and Appropriate requirements are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state (commonwealth) law that are well suited to the particular site. While not necessarily "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances of the site, relevant and appropriate requirements address problems or situations sufficiently similar to those encountered at the site to justify their use.

Factors To Be Considered are non-promulgated advisories or guidance, issued by federal or state (commonwealth) government, that are not legally binding and do not have the status of potential ARARs. However, in many circumstances such factors are considered along with ARARs in determining the level of cleanup required to protect human health and the environment.

Remedial actions must comply with both federal and state (commonwealth) ARARs. For a state (commonwealth) requirement to be an ARAR, it must meet three criteria:

- It must meet the definition of an ARAR.
- It must be more stringent than federal requirements.
- It must be a promulgated standard, requirement, criterion, or limitation under a state (commonwealth) environmental or facility citing law.

There are three types of ARARs. Location-specific ARARs restrict the occurrence of chemicals in certain sensitive environments, such as wetlands (for example, the Endangered Species Act). Action specific ARARs are activity or technology based, which typically control remedial activities that generate hazardous wastes (for example, RCRA). Chemical-specific ARARs are health based or risk management based numbers that provide concentration limits for the occurrence of a chemical in the environment (for example, USEPA Maximum Contaminant Levels [MCLs]). Remedial actions must comply with both federal and state (commonwealth) ARARs. The statutes and regulations listed in Table 5-1 contain requirements deemed to be potential ARARs at SWMU 6.

5.2 Remedial Action Objectives

The RAOs consist of specific goals for protecting human health and the environment. The RAOs for SWMU 6 are as follows:

- RAO 1 - Prevent human exposure to PCBs in edible-size fish and blue crab at concentrations that may pose unacceptable risk
- RAO 2 - Encourage development of a benthic community that reflects the physical environment represented by the SWMU 6 habitat relative to surrounding marine habitats

5.3 Contaminants of Concern

The post-removal HHRA and ERA identified the following COCs:

- HHRA: Dioxin-like PCBs and non-dioxin-like PCBs in edible-size fish/blue crab
- ERA: cadmium, copper, lead, and zinc in sediment for benthic organisms

5.4 Preliminary Remedial Goals

For protection of human health at SWMU 6, a sediment PRG was calculated for PCBs, the COC indentified for the fish/blue crab consumption exposure pathways in the HHRA. The following steps were used to calculate the sediment PRG for the SWMU 6 lagoon:

- Step 1 - Empirical biota-sediment accumulation factors (BSAFs) were calculated for each fish and blue crab sample using total PCB congener concentrations and average Aroclor mixture (total) concentrations in sediment. The median fish BSAF was selected to best represent the environmental setting over the exposure duration, to avoid one outlier PCB concentration in one fish sample (VWW06-FS03-0212) from dominating the BSAF, and because it was higher than the median crab BSAF as presented in **Table 5-2**.
- Step 2 – Fish PRGs were calculated for adult, youth, and child consumers based on the exposure assumptions used in the HHRA (**Appendix E, Attachment 1**), with the exception that a more realistic consumption frequency of 1 meal/month was used for the PRG calculation because of the scarcity of edible-size fish and blue crabs in the lagoon, as observed during the biota sampling event in January/February 2012. Four sets of fish PRGs were calculated, based on a target ELCR of 10^{-4}, 10^{-5}, 10^{-6}, and target HQ of 1. The lowest ELCR-based fish PRGs were for adult consumers, and the lowest non-cancer-based fish PRGs were for child consumers.
- Step 3 – The final sediment PRG for total PCBs was identified based on the lower of the cancer-based PRG (target risk of 10^{-4} for adult consumers) and non-cancer-based PRG (target HI of 1). The sediment PRG (0.2 mg/kg) is presented in **Table 5-2**.

The toxicity of dioxin-like PCBs was not incorporated into the sediment PRG. Sediment PRGs below the proposed sediment PRG of 0.2 mg/kg for Aroclor 1254 would be technically impractical to achieve, and would be inconsistent with PRGs for other sediment remediation sites (which are typically based on “total PCBs”).

For the protection of the benthic community at SWMU 6 (if maintained), the performance goal will be the establishment of a benthic community structure that can sufficiently support the upper-trophic-level fish and wildlife populations likely found in uncontaminated lagoon systems similar to SWMU 6. The ERA identified cadmium, copper, lead, and zinc as sediment COCs (for direct exposures of benthic invertebrate receptors) based largely on a comparison to very conservative ecological screening values, which for these four metals are based on Effects Range-Low (ER-L) values from the literature (Long et. al., 1995). ER-L values represent the 10th percentile of ranked effects data from a set of toxicity/field studies reported in the literature (mostly from the U.S. mainland). A measure of the site-specific bioavailability of these metals (i.e., simultaneously extracted metals/acid volatile sulfides [SEM/AVS]) was considered in the ERA and indicated the SEM/AVS ratios in nearly all SWMU 6 lagoon sediment samples exceeded one (mean of 12.6), suggesting that these metals are currently bioavailable. However, SEM/AVS ratios in the undisturbed sediment of the adjacent, offsite Laguna Kiani lobe

complex were much less than one (mean of 0.06), which is a strong indication of what SWMU 6 sediments would also attain when equilibrium is reached following the interim removal action. As post-interim-removal-action sediment conditions stabilize in the SWMU 6 lagoon, including the natural accumulation of total organic carbon and increased sulfides, SEM/AVS ratios are expected approach those of the Laguna Kiani lobe complex and therefore restrict the bioavailability of cadmium, copper, lead, and zinc in the future. Considering the current and potential future (assuming undisturbed) site-specific conditions, Effects Range-Median (ER-M) values, which represent the 50th percentile of the ranked effects data used to develop the ER-L, were selected to identify sediment PRGs for the site because of: (1) the level of conservatism of the ER-L, (2) the ecological RAO, and (3) the past use of ER-M values as remediation criteria at other CERCLA sites. The ER-Ms for cadmium (9.6 mg/kg) and copper (270 mg/kg) are greater than the maximum detected concentrations in SWMU 6 lagoon sediment; therefore, remedial action (and therefore PRGs) for cadmium and copper is not necessary. PRGs for the remaining metals, based on ER-M values, are as follows:

- Lead = 218 mg/kg
- Zinc = 410 mg/kg

5.5 General Response Actions

Based on site-specific conditions and *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (USEPA, 2005), the following response actions were identified for SWMU 6:

- No Action
- Institutional Controls
- Monitoring
- Monitored Natural Recovery
- In-situ Capping
- Soil Covering
- Removal
- Phytoremediation
- Disposal

The GRAs describe the broad range of actions that may satisfy the RAOs at the site. With the exception of the No Action alternative, each GRA can be achieved through the implementation of site-specific remedial technologies. In this context, the following definitions apply:

- Remedial technologies are defined as the general categories of remedies under a GRA.
- Process options are specific categories of remedies within each remedial technology. The process options are used to implement each remedial technology.

The screening of remedial technologies is summarized below.

5.6 Identification and Screening of Remedial Technologies

Certain technologies and/or process options are not appropriate for implementation at SWMU 6 because of impracticality, site conditions, economics, access, or COC characteristics, and were excluded from further consideration. The technology types and process options available for remediation of sediment were screened accordingly. There is no presumptive remedy for contaminated sediment. The purpose of this step is to identify the technologies that may be applicable for remediation of the sediment and restoration of the benthic community at SWMU 6. In order to meet the RAOs, a combination of several technologies and/or response actions may be necessary. Technologies potentially applicable are screened in general accordance with USEPA guidance *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (USEPA, 2005).

Table 5-3 summarizes the results of the technology screening process and process options. A narrative description of technologies and summary of technology screening for SWMU 6 is provided below.

5.6.1 Description of Technologies

No Action

No Action means that no further removal/remedial action would be conducted at the site. It is typically retained as a remedial alternative to provide a baseline option to which other alternatives can be compared. No Action does not control, contain, or remediate potential contaminant sources, MEC hazards, or exposure.

Institutional Controls (ICs)

Institutional controls (ICs) are measures used for land use control (LUC), site access restrictions, and limitation or prevention of exposure. ICs potentially applicable at the site include administrative restrictions such as LUCs and deed notations for fishing and crabbing warning, ban, and restrictions, as well as access warning and restrictions (fences/signs) (USEPA, 2000a). ICs alone do not control, contain, or remediate potential contaminant sources or reduce the mobility, volume, or toxicity of the contamination; rather, they reduce the potential for contact through control of exposure pathways. The Navy uses a Web-based management tool, LUC Tracker, as part of the Naval Installation Restoration Information System (NIRIS). Several ICs could be implemented at the site at a reasonable cost. However, ICs alone will not meet the RAOs for the site. ICs are retained for consideration as a component to be combined with other possible actions.

Long-term Monitoring (LTM)

Long-term monitoring is applicable for SWMU 6. LTM could include periodic sediment sampling of COCs. Standard sampling procedures for sediment have been established and conducted at SWMU 6, so these are readily implementable technologies. This technology is retained for further evaluation.

Monitored Natural Recovery

Monitored Natural Recovery (MNR) may rely on a wide range of naturally occurring physical, biological, and chemical processes to isolate, contain, destroy, or reduce the bioavailability or toxicity of contaminants in part through burial that occurs from natural sedimentation (fresh sediment deposition). MNR is effective in habitat establishment and preservation, which would be applicable for SWMU 6 since it is in an area of deposition and likely protected from most potential erosion events. It may also be applicable if the potential for unacceptable human health and ecological risk is low or can be controlled. The most significant costs associated with MNR are most often due to monitoring requirements. This technology is retained for further evaluation.

In-situ Capping

In-situ capping involves placement of cover materials (sand or commercially available reactive medium such as reactive core matt) over sediments to isolate sediments and reduce bioavailability. This technology would be effective in protecting human health by breaking the exposure pathway and minimizing contaminant release to the environment. However, it would essentially ”restart the clock” for recovery of the benthic community due to disturbance of the ecological system during the construction. It is relatively easy to implement because dewatering would not be needed; the quantity of sand needed is likely available on Vieques; and Reactive Core Matt (RCM) is commercially available. This technology is retained for further evaluation.

Soil Covering

Soil covering involves draining and covering the lagoon with soil to eliminate human health and ecological exposure pathways. The current marine sediment environment would be returned to a condition similar to the pre-removal wetland setting (i.e., vegetated with black mangroves). This technology may be applicable to the lagoon if complete elimination of fishing and crabbing and associated biota exposure pathways to lagoon sediment is favored. This alternative would be also effective in limiting the potential for direct contact and erosion. The cost can be very high, in part due to the need to dewater. In case the lagoon cannot be completely dewatered due to groundwater intrusion or surrounding surface water, soil covering may be possible from the bank working outward into the lagoon. Nevertheless, this technology is retained for further evaluation due to the significant risk reduction obtained.

Sediment Excavation

Sediment excavation is a removal technology involving excavation of impacted sediment using standard construction equipment (i.e., backhoes, bulldozers, and front-end loaders) after draining the lagoon. This technology is effective in reducing or eliminating current/future potential for biota exposure to contaminated sediment, but may also mobilize contaminants and leave residual contamination behind, which may require multiple mobilizations to remove enough contaminated sediment to achieve the PRGs. Fugitive emissions such as dust and particulates may be a problem during operations. Communities often oppose the transportation of excavated material through populated areas. Excavated sediment would need temporary staging and characterization and dewatering to meet land disposal restrictions during the Transport and Disposal (T&D). In addition, this technology would destroy the existing benthic community. Dewatering and excavation would require surface water disconnection between SWMU 6 lagoon and adjacent Laguna Kiani Complex Lobe. However, excavation and off-site disposal is a readily implementable technology. This technology is retained for further evaluation.

Sediment Dredging

Sediment dredging is another removal technology involving direct application mechanical or hydraulic force to remove sediment. Mechanical dredging entrains less water than hydraulic dredging. Hydraulic dredging involves removal of sediment slurry by suction. Sediment must be predominantly fine-grained to be handled by hydraulic dredge. Water content of dredged sediment is higher than mechanical dredging. This technology is effective in reducing or eliminating current and future potential for biota exposure to contaminated sediment, but may also mobilize contaminants and leave residual contamination behind. It is moderate to difficult to implement. This technology lacks precision during sediment dredging. There is potential water column impact from sediment resuspension. Dredged sediment requires proper handling (upland dewatering and pretreatment containment cell) prior to disposal. This technology would destroy existing benthic community. This technology is not retained for further evaluation because no upland treatment/disposal facilities are available, dredging equipment is not readily available, and due to the relatively high cost.

Phytoremediation

Phytoremediation involves mechanisms such as plant uptake, phytodegradation, phytoaccumulation by some plant species, and rapid rhizodegradation for removal of contaminants from sediment. This technology has received high public acceptance at other sites; no secondary waste production if phytoremediation is engineered to enhance rhizodegradation. It is a relatively immature technique, considered most useful in terrestrial applications. Accumulated contaminants (metals) would require periodic harvesting and disposal. This technology is not retained for further evaluation because it is typically used for terrestrial applications and may not be suitable for the lagoon setting at SWMU 6.

Disposal

Disposal includes disposal of non-hazardous wastes and hazardous waste in landfill, upland application (placement of dredged sludge in an upland containment structure adjacent to dredged site), and off-site incineration. Upland application is not retained due to the limited site area, dewatering and pretreatment required, and potential for long-term liability. Off-site incineration is not retained due to high cost; not amenable for SWMU 6 site conditions with low contaminant concentrations. Landfill disposal is retained because this has been previously used at SWMU 6 for disposal of excavated materials and debris.

5.6.2 Retained Technologies

Based on the screening of potential technologies, the following technologies were retained for developing remedial alternatives in Section 6:

- No Action
- ICs
- LTM
- MNR
- In-situ Capping

- Soil Covering
- Sediment Excavation
- Disposal

5.7 Sustainability

Executive Order 13242, Strengthening Federal Environmental, Energy, and Transportation Management, requires Federal agencies to implement sustainable practices. Sustainability is a greening process focused on energy conservation, reduction of greenhouse gases, waste minimization, and re-use and recycling of materials. These considerations are not NCP requirements for remedial alternatives, but may be considered during the alternative selection process.

Green remediation results in effective cleanups, minimizing the environmental and energy footprints of site remediation and revitalization (USEPA, 2008). Sustainable practices emphasize the need to more closely evaluate core elements of a cleanup project, compare the site-specific value of conservation benefits gained by different strategies of green remediation, and weigh the environmental trade-offs of potential strategies.

The sustainability of each alternative is evaluated by the SiteWiseTM tool. SiteWiseTM is a stand-alone analytical tool to efficiently and systematically conduct a sustainability analysis of remediation technologies, thereby providing a tool for selecting a remediation alternative that is based not only on seven standard NCP selection criteria, as detailed in Section 7, but also on the basis of the environmental footprint of the technology. The sustainability analysis evaluates the environmental footprint of each remedial alternative considered in terms of five metrics, comprising:

- Greenhouse gases (GHGs) reported as carbon dioxide equivalents (CO_2e), consisting of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O);
- Energy usage (expressed as British Thermal Unit [BTU]);
- Water consumption (gallons)
- Air emissions of criteria pollutants consisting of oxides of nitrogen (NOx) and sulfur (SOx), and particulate matter (PM); and
- Accident risk (risk of injury and risk of fatality).

A low environmental footprint indicates low deleterious impacts to environmental and social metrics, which collectively make up the SiteWiseTM sustainability metrics. Conversely, a high environmental footprint indicates high deleterious impacts. A summary of the sustainability analysis for SWMU 6 is included in Appendix H. The major conclusions of this sustainability analysis are incorporated into the short-term effectiveness criteria evaluation in Section 7 of this FS Report.

Table 5-1(a)
Federal Chemical-Specific ARARs
SWMU 6 Feasibility Study
Former NASD, Vieques, Puerto Rico

Media	Requirement	Prerequisite	Citation	Alternative	ARAR Determination	Comment
Risk Assessment Guidance for Superfund (EPA, 1989)						
Sediment	Chemical concentration corresponding to levels of EPA acceptable risks to human receptors (fish and blue crab consumers) based on site-specific exposure assumptions.	Assessment of potential human health risks. Presence of adequate edible-size fish and blue crabs in the lagoon to support assumed frequency of food consumptions.	Risk Assessment Guidance for Superfund (RAGS; EPA, 1989) only as it applies to PCBs in fish and blue crab -potentially consumed by humans	1,2,3,4,5	TBC	RAGS was used to assess the potential risks to human health from consumption of fish and blue crab. Acceptable risk is defined by EPA as having a hazard index (HI) of 1 or less and excess lifetime cancer risk (ELCR) of -10^{-4} or less. A PRG of 0.2 mg/kg (based on HI of 1) for total PCBs in sediment was established to prevent unacceptable risk to human health from exposure to PCBs in edible-size fish and blue crab.
Marine Sediment Screening Values (Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995)						
Sediment	Chemical concentrations corresponding to levels of risks to ecological receptors (flora and/or fauna).	Assessment of potential ecological risks.	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments (Long, et. al., 1995) only as it applies to Lead (CAS # 7439-92-1) and Zinc (CAS# 7440-66-6)	1,2,3,4,5	TBC	The following PRGs were set using limits derived from ecological risk assessment: Lead - 218 mg/kg Zinc - 410 mg/kg

USEPA. 1989. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response. EPA/540/1-89/002. December.

Table 5-1(b)
Puerto Rico Chemical-Specific ARARs
SWMU 6 Feasibility Study
Former NASD, Vieques, Puerto Rico

Media	Requirement	Prerequisite	Citation	Alternative	ARAR Determination	Comment
Puerto Rico Water Quality Standards						
Discharges to surface water	Sets surface water standards for receiving waters.	Discharging of surface water from the lagoon to adjacent surface water body	Rule 1303C, 1303.1A, B, D, E, and H	3, 4, 5, 6	Applicable	Applicable to surface water discharges associated with dewatering the lagoon or constructing subaqueous caps. Site investigations did not identify COCs in surface water, therefore it is assumed that existing concentrations of any substances are equivalent to background and further testing is not required.

Table 5-1(c)
Federal Location-Specific ARARs
SWMU 6 Feasibility Study
Former NASD, Vieques, Puerto Rico

Location	Requirement	Prerequisite	Citation	Alternative	ARAR Determination	Comment
Coastal Zone						
Coastal zone or area that will affect the coastal zone	Federal activities must be consistent with, to the maximum extent practicable, State coastal zone management programs.Federal agencies must comply with the the cited consistency requirements.	Actions that may affect identified coastal zone resources or uses	15 CFR 930.33(a)(1), (a)(2), (b); .35(a), (b); .36(a)	All	Applicable	Activities at SWMU 6 that will affect Puerto Rico's coastal zone will be consistent to the maximum extent practicable with Puerto Rico's enforceable policies. Activites performed on-site and in compliance with CERCLA are not subject to adminsitrative review; however the substantive requirements of making a consistency determination will be met.
Migratory Bird Flyway						
Migratory bird area	Protects almost all species of native birds in the United States from unregulated taking.	Presence of migratory birds.	Migratory Bird Treaty Act, 16 USC 703	All	Applicable	The site is located in the Atlantic Americas Migratory Flyway. If migratory birds , or their nests or eggs, are identified at the site, operations will not destroy the birds, nests, or eggs.

Table 5-1(d)
Puerto Rico Location-Specific ARARs
SWMU 6 Feasibility Study
Former NASD, Vieques, Puerto Rico

Location	Requirement	Prerequisite	Citation	Alternative	ARAR Determination	Comment
No Puerto Rico Location-Specific ARARs apply.						

Table 5-1(e)
Federal Action-Specific ARARs
SWMU 6 Feasibility Study
Former NASD, Vieques, Puerto Rico

Action	Requirement	Prerequisite	Citation	Alternative	ARAR Determination	Comment
Storm Water Pollution Control						
Construction activites that will result in land disturbance	Requires the development and implementation of best management practices and erosion and sedimentation control measures during construction activity.	Construction activities that will disturb more than one acres of land	"one to five acres: 40 CFR 122.26(a)(1)(ii), (a) (9)(i)(b), (b)(15); 122.44(k)(2) and (s)(1) five acres or more: 40 CFR 122.26(a)(1)(ii), (a)(9)(i)(b), (b)(14)(x); 122.44(k)(2) and (s)(2)	3, 4, 5, 6	Applicable	If the selected remedy disturbs greater than one acre of land a Storm Water Pollution Prevention Plan or equivalent document will be prepared and implemented. Since activities are taking place on site and in compliance with CERCLA, the substantive requirements will be met, but a permit will not be requried.
Disturbance of Wetlands						
Discharge of dredge-and-fill material	No discharge of dredged or fill material will be allowed unless appropriate and practicable steps are taken that minimize potential adverse impacts of the discharge on the aquatic ecosystem.	Discharges of dredged or fill material to surface waters, including wetlands.	40 CFR Part 230.10(d); 33 CFR 320.4(b), (d), (p), and (r)	3, 4, 5, 6	Applicable	Activites include disturbance and discharges of fill to wetlands and surface water. Where wetland areas are temporarily disturbed and returned to their original condition no mitigation plan is required. If the remedy results in a net loss of wetland a Wetland Mitigation Plan or equivalent document must be prepared and implemented. Onsite CERCLA actions are not subject to permitting or administrative reveiws however the lead agent may consult with other agencies to ensure that the substantive requirements of these regulations are met.

Table 5-1(f)
Puerto Rico Action-Specific ARARs
SWMU 6 Feasibility Study
Former NASD, Vieques, Puerto Rico

Action	Requirement	Prerequisite	Citation	Alternative	ARAR Determination	Comment
Control of Erosion and Prevention of Sedimentation						
Land disturbance	A Control of Erosion and Sediment (CES) Plan and a Work Plan must be prepared for any activities that involve the alteration of ground or soil conditions that have not been specifically excluded.	Disturbance of more than 40 cubic meters of soil during construction activity	Puerto Rico Regulation 5754.1230(B), (C)	3, 6	Applicable	These alternatives involve the disturbance of more than 40 cubic meters of soil. A CES and Work Plan or equivalent will be prepared for this activity.
Air Pollution Control						
Production of Fugitive Dust	Dust control measures must be implemented during construction activities to prevent emissions beyond the property boundary. These include, but are not limited to, the use of water or other chemicals on road ways to control dust, covering haul trucks, and cleaning tracked soil off of paved roads.	Construction activity causing particulate matter to become airborne	Puerto Rico Regulation 5300.404(A)(2), (4), (7); (B)	3, 4 ,5, 6	Applicable	These alternatives involve activities that may produce fugitive dust emissions. Dust control measures will be implemented during the onsite activities.
Noise Pollution Control						
Construction activity	No construction activity may be performed at night or in such a way that vibrations are produced that can be felt beyond the property boundary. If equipment used in construction is not manufactured in accordance with USEPA standards for newly manufactured equipment then it may not produce noise that exceeds 70 dBA.	Construction activity including earthwork	Puerto Rico Regulation 3418.26	3, 4, 5, 6	Applicable	The site is considered to be in Zone II (Commercial) for noise production. Noise pollution during activities will be prevented.
Investigation-Derived Waste Management						
		Generation of non-hazardous solid waste that is managed onsite in containers or in piles.	Puerto Rico Non-Hazardous Solid Waste Regulation 531.H	3	Applicable	It is anticipated that non-hazardous solid wastes will be generated during the implementation of these alternatives. IDW will be sampled as needed to confirm characterization prior to disposal.

Acronyms and Abbreviations

ARAR	Applicable or relevant and appropriate requirement
BTAG	Biological Technical Assistance Group
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COCs	Chemicals of Concern
ELCR	excess lifetime cancer risk
IDW	investigation derived waste
LTM	Long Term Monitoring
PCB	Polychlorinated biphenyls
PRG	Preliminary Remedial Goal
RSL	Regional Screening Level
TBC	To Be considered
USC	United States Code
USEPA	United States Environmental Protection Agency

References

USEPA, 1998. *CERCLA Compliance with Other Laws Manual: Interim Final* . Office of Emergency and Remedial Response. EPA/540/G-89/006.

USEPA, 1998. *CERCLA Compliance with Other Laws Manual: Part II. Clean Air Act and Other Environmental Statutes.* Office of Emergency and Remedial Response. EPA/540/G-89/009.

USEPA, 1998. RCRA, Superfund & EPCRA Hotline Training Manual. Introduction to Applicable or Relevant and Appropriate Requirements. EPA540-R-98-020.

Table 5-2
Calculation of Sediment Preliminary Remedial Goal
SWMU 6
Former NASD, Vieques, Puerto Rico

Step 1 - Calculation of BSAFs

	Biota Type	Biota - Total PCB Congener Conc. (pg/g)	Biota - Total PCB Congener Conc. (mg/kg)	Empirical BSAF (unitless)	Average BSAF	Median BSAF	Maximum BSASF
VWW06-FS01-0112	Fish	61600	0.0616	0.330	1.23	0.37	4.01
VWW06-FS01P-0112	Fish	71205	0.0712	0.382			
VWW06-FS02-0212	Fish	68828	0.0688	0.369			
VWW06-FS03-0212	Fish	747404	0.7474	4.008			
VWW06-FS04-0112	Fish	37323	0.0373	0.200			
VWW06-CRB01-0112	Blue Crab	65445	0.0654	0.351	0.28	0.31	0.39
VWW06-CRB01P-0112	Blue Crab	72075	0.0721	0.386			
VWW06-CRB02-0112	Blue Crab	44870	0.0449	0.241			
VWW06-CRB03-0112	Blue Crab	48750	0.0488	0.261			
VWW06-CRB04-0112	Blue Crab	19290	0.0193	0.103			
Sediment - avg. Aroclor mixture conc. † (mg/kg) =			0.1865				

Notes:
To avoid influence from an extremely high concentration of PCB in one fish sample (FS03-0212), the median fish BSAF was used as a central tendency value for SWMU 6.
Detected PCB congeners were used to calculate total PCB congener concentrations.
BSAF = Total PCB congener conc. in biota/ Avg. Aroclor mixture conc. in sediment.
† Half the reporting limit was used for non-detected Aroclors.

Step 2 - Calculation of Fish PRGs (mg/kg)

	Exposure Assumption				Biota PRG (mg/kg) (Based on Target ELCR)			Biota PRG (mg/kg) (Based on Target HI)
	BW (kg)	EF (meals/yr)	IR (kg-fish/meal)	ED (year)	1E-04	1E-05	1E-06	1
Adult	70	12	0.227	24	1.37	0.14	0.014	0.19
Youth	39	12	0.227	10	1.83	0.18	0.018	0.10
Child	15	12	0.114	6	2.33	0.23	0.023	0.08
	ATC	25550 days						

Toxicity Values	CSF	2.00E+00	1/(mg/kg-day)
	RfD	2.00E-05	mg/kg-day

CSF: High-Risk PCBs (IRIS)
RfD: Aroclor 1254 (IRIS)

PRG Equations 1&2

*Biota PRG (carc.) = (TR * BW * ATC) / (EF * IR * ED *CSF)*

*Biota PRG (carc.) = (THQ * BW * ED * 365 * RfD) / (EF * IR * ED)*

Step 3 - Calculation of Sediment PRG (mg/kg)

		BSAF	Sediment PRG (mg/kg) (Based on Target ELCR)			Sediment PRG (mg/kg) (Based on Target HI)
			1E-04	1E-05	1E-06	1.0
Fish	Median Fish BSAF	0.37	3.7	0.4	0.04	**0.2**

PRG Equation 3

Sediment PRG = Biota PRG / BSAF

Note:
Sediment PRGs were calculated using adult exposure assumptions for carcinogenic toxicity endpoint and child exposure assumptions for non-carcinogenic toxicity endpoint.

Table 5-3

Technology Screening Summary

SMWU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

General Response Actions	Remedial Technology	Process Options	Descriptions	Effectiveness	Implementability	Relative Cost	Retain	Reject
No Action	None	None	No active remedial action. This process option is retained to provide the basis for comparing active process options and technologies.	None	Not Applicable (Required by NCP to include in the FS evaluation)	Not Applicable	x	
Institutional Controls	Administrative Restrictions	Land-Use-Controls (LUCs)/Deed Notices	LUCs/deed notations to restrict future access, intrusive activities, and/or fishing/crabbing activities.	Effective in protecting human health	Easy to implement	Low	x	
	Access Restrictions	Fences and Signs	Security fences/signs installed and maintained as physical barriers to restrict future access, intrusive activities, and/or fishing/crabbing activities.	Effective in limiting site access	Easy to implement. Site currently partially restricted by fence and signs.	Low	x	
Monitoring	Sediment LTM	Performance Monitoring	Periodic sediment sampling to assess COC concentrations in sediment relative to PRGs	Effective	Easily implemented with standard sampling/analytical procedures.	Low short-term cost, but long-term cost could be moderate to high.	x	
Monitored Natural Recovery	Monitored Natural Recovery (MNR)	Natural Processes; Performance Monitoring	MNR may rely on a wide range of naturally occurring physical, biological, and chemical processes to isolate, contain, destroy, or reduce the bioavailability, toxicity, or mobility of contaminants primarily through burial that occurs from natural sedimentation (deposition). Periodic sediment monitoring should be incorporated.	Effective in habitat preservation; applicable for SWMU 6 site which is in an area of deposition; especially suitable for site with relatively low or expected low human health risk or exposure.	Non-intrusive and easy to implement	Low short-term cost, but long-term cost could be moderate to high.	x	
In Situ Capping	In-situ Sand Capping; In-situ Reactive Capping	Passive or Reactive Capping	Placement of cover materials (sand or reactive core matt) over sediments to isolate contaminated sediments and reduce bioavailability	Effective in protecting human health; Would require longer time for recovery of the benthic community due to temporary disturbance/destruction of the ecological system during the implementation.	Relative easy to implement; no need for dewatering; minimizes the potential for contaminant release to the environment; securing local source of sand may be challenging; Reactive Core Matt (RCM) commercially available	Moderate to high	x	
Soil Covering	Native-soil Covers	Non-impacted native soil cover	Filling-in and covering lagoon with soil after dewatering to eliminate human health and ecological exposure pathways (the current marine sediment environment would become a near terrestrial surface soil condition by eliminating sediment and surface water)	Effective in limiting potential for direct contact and erosion. The EPA Regional Screening Level (RSL) for soil, instead of more stringent Eco Marine – Sediment criteria would be applicable to the site.	Requiring lagoon dewatering. Applicable to lagoon if complete elimination of fishing and crabbing or minimization of stormwater ponding is desired.	Moderate to high	x	

Table 5-3

Technology Screening Summary

SMWU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

General Response Actions	Remedial Technology	Process Options	Descriptions	Effectiveness	Implementability	Relative Cost	Retain	Reject
Removal	Sediment Excavation	Dewatering/ Sediment Removal	Excavation of impacted sediment using standard construction equipment (e.g, backhoes, bulldozers, and front-end loaders) after the lagoon is dewatered. The excavated sediment would be dewatered prior to disposal.	Likely effective in contaminated sediment above PRGs. Fugitive emissions such as dust and particulates can be a problem during operations. Communities often oppose the transportation of excavated material through populated areas. Excavated sediment would need temporary staging and characterization and meet land disposal restrictions during the Transport and Disposal (T&D). The technical challenges of dewatering, uncertainty of sediment depth requiring removal, and potential for re-deposition of	Excavation and off-site disposal is a generally a relatively simple process, well proven and readily implementable technology. However, technical challenges noted previously may hinder the implementability at SWMU 6. Detroys existing benthic community.	High	x	
	Sediment Dredging	Mechanical Dredging	Direct application mechanical force to remove sediment	Likely effective in contaminated sediment above PRGs. Entrains less water than hydraulic dredging. Little residual risk but may not completely remove contaminated sediment above PRGs.	Moderate to difficult to implement, especially considering lack of precision during sediment dredging. Potential water column impacts from sediment resuspension. Dredged sediment requires proper handling (upland dewatering and pretreatment containment cell) prior to disposal. Destroys existing benthic community.	High		x (Typically used for navigation and water ways inaccessible by common excavation)
	Sediment Dredging	Hydraulic Dredging	Removal of sediment slurry by suction	Likely effective in contaminated sediment above PRGs. Sediment must be predominantly fine-grained to be handled by hydraulic dredge. Water content of dredged sediment is increased over mechanical dredging. Little residual risk but may not completely remove contaminated sediment.	Moderate to difficult to implement, especially considering lack of precision during sediment dredging. Potential water column impacts from sediment resuspension. Dredged sediment requires proper handling (upland dewatering and pretreatment containment cell) prior to disposal.	High		x (Typically used for navigation and water ways inaccessible by common excavation)
Phyto-remediation	Physical/Plant uptake/Phyto-degradation/Rhizo-degradation	Plants	Removal of contaminants from sediment through plant uptake	Generally accepted by public; may not be affective on all COCs.	Relatively immature technique; considered most useful in terrestrial applications. Accumulated contaminants (metals) would require periodical harvesting and disposal	Low to moderate		x (Typically used for terrestrial applications; not likely suitable for SWMU 6
Disposal	Landfill	RCRA Landfill (HW)	Solid hazardous wastes are permanently disposed of in a RCRA-permitted landfill.	Disposal options for certain waste (e.g., mixed waste) may be limited.	Applicable for dredged/excavated sediment if characterized as hazardous waste	Moderate to high	x	
	Landfill	Non-RCRA Landfill (Non HW)	Solid non-hazardous wastes are permanently disposed of in a non-RCRA landfill.	Disposal options for certain waste (e.g., mixed waste) may be limited.	Applicable for dredged/excavated sediment not characterized as hazardous waste	Low to moderate	x	
	Land Disposal	Land Application	Placement of dredged sludge in a Confined Disposal Facility (an upland containment structure) adjacent to dredged site	Effective, but may contribute to further impact to soil and groundwater without a cap.	Dewatering and pretreatment required. Potential for long-term liability.	Moderate to high.		X (Not retained due to the limited site area).
	Offsite Incineration	Incineration	High temperatures, 870 to 1,200°C (1,400 to 2,200°F), are used to volatilize and combust (in the presence of oxygen) halogenated and other refractory organics in hazardous wastes	Not effective for metals at SWMU 6. Not cost efficient for sediment with low COC concentrations. If an off-site incinerator is used, the potential risk of transporting the hazardous waste through the community must be considered.	The destruction and removal efficiency (DRE) for properly operated incinerators exceeds the 99.99% requirement for hazardous waste and can be operated to meet the 99.9999% requirement for PCBs.	High		X (Not retained due to high cost, presence of metals, and relatively low contaminant concentrations at SWMU 6).

Notes:

Effectiveness is the ability to perform as part of an overall alternative that can meet the objective under conditions and limitations that exist onsite

Implementability is the likelihood that the process could be implemented as part of the remedial action plan under the physical, regulatory, technical, and schedule constraints

Relative cost is for comparative purposes only and it is judged relative to the other processes and technologies that perform similar functions.

SECTION 6

Development of Remedial Alternatives

This section presents a description of remedial alternatives developed to meet the RAOs. In accordance with USEPA (1988), remedial alternatives were developed by assembling remedial technologies and representative process options after the initial screening process. Cost estimates for each remedial alternative are provided in **Appendix G**.

Six remedial alternatives were developed to address the potentially unacceptable human health risk for fish and aquatic crab consumption as well as direct exposures to COCs in sediment by lower trophic level receptors. The alternatives developed comprise:

- Alternative 1—*No Action*
- Alternative 2— *Monitored Natural Recovery and Land Use Controls*
- Alternative 3— *Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment*
- Alternative 4— *In-situ Sand Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls*
- Alternative 5— *In-situ Reactive Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls*
- Alternative 6— *Intertidal Forested Wetland Restoration and Land Use Controls*

A detailed description of each of these alternatives is provided below.

6.1 Alternative 1 – No Action

Alternative 1 consists of no action, as required by NCP to be retained throughout the FS process as a baseline for comparison to the other alternatives. To the south, along Highway 200, SWMU 6 is partially restricted by a 6-foot-tall chain-link fence with two signs for warning potential trespassers **(Figure 6-1).** The dense vegetation to the east and the Laguna Kiani complex to the west and north provide a natural barrier that discourages or inhibits potential access by trespassers. However, the No Action alternative may not sufficiently deter trespassing and fishing and crabbing at the lagoon and would allow potentially contaminated fish and crab to leave the site and enter the Laguna Kiani complex. The major components of Alternative 1 include the following:

- No additional removal beyond the removal conducted during the NTCRA.
- No additional LUCs to restrict consumers' exposure to fish and crab from fishing and crabbing activities.
- No sediment monitoring or monitoring to verify the fence and signs remain intact.
- Five-year reviews (for an estimated 30 years) would be required.

6.2 Alternative 2 – Monitored Natural Recovery and Land Use Controls

Alternative 2 comprises MNR and LUCs. MNR involves leaving contaminated sediments in place and allowing natural processes to contain, destroy, or reduce the exposure to, concentrations of, and/or bioavailability of the COCs. For human health, total detected PCB concentration in SWMU 6 sediment is 0.26 mg/kg, which is marginally higher than PRG of 0.2 mg/kg. For the benthic community, HQs for cadmium, copper, lead, and zinc were marginally elevated above ecological screening values (ranging from 1.8 to 4.4 based on mean concentrations) using conservative assumptions. While it is possible that these levels could impair the benthic community quality, it is also possible that the existing benthic community is still developing due to the relatively recent interim removal action that created the lagoon. MNR is especially amenable for sites with relatively low human health and ecological risks through two primary natural mechanisms: (1) burial of contaminated sediments by natural deposition; and (2) sequestration or transformation of contaminants through biological, chemical, or physical processes to less toxic or bioavailable forms. Burial results in natural covering, which uptake of

contaminants from sediments to biota, reduces or prevents re-suspension of contaminated sediments, and protects the benthic community, upper-trophic-level receptors, and, ultimately, human receptors from exposure to the contaminants. MNR requires LTM to help verify that risk is controlled or ultimately reduced to acceptable levels. For SWMU 6, unacceptable, but relatively low human health and ecological risks were identified: for human health, the total detected PCB concentration in SWMU 6 sediment is 0.26 mg/kg, which is marginally higher than PRG of 0.2 mg/kg; for the benthic community, lead and zinc were marginally elevated above ecological screening values. MNR of PCBs in the sediment is primarily through natural covering of fresh sediment from deposition and adsorption to organic matter in the sediment, although anaerobic biodegradation may occur albeit relatively slowly. MNR of metals is primarily through precipitation as metal sulfides during anaerobic sulfate reduction process and natural covering of fresh sediment from deposition. Based on observations made of the post-removal, developing ecosystem at SWMU 6, it is anticipated that within an additional few years, RAOs would be met by the MNR processes described above. For FS cost estimating purposes, it is assumed that annual monitoring for contaminants in sediment will be necessary for 5 years to meet PRGs for Alternative 2. However, the actual monitoring duration and protocol will be based on observations made during long-term monitoring. LUCs would be incorporated as part of remedy to help protect human health (e.g., through fishing and crabbing advisory or ban; restrictions on intrusive activities that may disturb the sediment) during recovery.

The conceptual layout of Alternative 2 is shown in Figure 6-2. The assumptions and components of Alternative 2 include:

- Natural recovery of the ecological system, combined with additional vegetative enhancement (e.g., seagrass, native salt marsh, and mangroves) along the perimeter and intermittent inundation area to help accelerate establishment of lagoon plant species and associated function as a nursery for fish and invertebrates.
- Annual sampling for the COCs in sediment for an assumed 5 years. For the purposes of the FS cost estimating, it is assumed that five sediment samples for PCB, lead, and zinc analysis would be collected during each sampling event. The number of samples is conceptual and subjective, but appropriate for FS cost estimating purposes. Varying the number of samples would not substantially alter the alternative cost or affect the overall ranking. The actual monitoring frequency and protocol would be documented in the LTM Work Plan, which would be subject to regulatory agency review and approval.
- Implementing physical barriers (boundary survey, fencing, gates, and signage), and LUCs (deed notations) to restrict unauthorized access and intrusive activities for an assumed 30 years. It is assumed that additional 400 linear feet of 6-foot high fence and additional two signs would be installed around the lagoon. The LUC boundary encompassing SWMU 6 would be surveyed by a professional land surveyor. The physical barriers could also include blocking the narrow hydraulic connection between the SWMU 6 lagoon and the Laguna Kiani complex to the north. While installing the hydraulic barrier as part of this alternative would not prevent upper trophic level organisms from accessing SWMU 6, the hydraulic barrier would prevent tidal exchanges and may result in the relatively rapid drying of the shallowest portions of the lagoon or at least create stagnant conditions that would not likely support a diverse benthic (or fish) community upon which upper trophic level organisms would rely. Because a hydraulic barrier is not an inherent part of Alternative 2, the associated cost is not included in the cost estimate. However, if a hydraulic barrier is deemed beneficial, the additional cost would be the same as that shown for the earthen berm in Alternatives 3 and 6 and the details of its construction included in the RA Work Plan.
- Five-year reviews for 30 years due to the need of LUCs to restrict unauthorized intrusive activities that would disturb the sediment deposition layer.

6.3 Alternative 3 – Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment

Alternative 3 would involve excavation, dewatering, and off-site disposal of an estimated 2 additional feet of sediment (equivalent to an excavation volume of over 1,155 cubic yards) to eliminate contaminant levels posing unacceptable human health and ecological risks. The actual depth of sediment removal required to achieve the

PRGs is unknown, which yields considerable cost uncertainty in this alternative because it could be considerably more than 2 feet. The uncertainty is associated with such factors as the depth of contaminant concentrations above PRGs and residual contaminant concentrations resulting from sediment suspension and re-deposition during excavation. However, the 2-foot estimate is based on the general depth of excavation during the interim removal action (Shaw, 2010) and is sufficient for FS cost estimating purposes. The exact depth of required excavation would be determined based on the post-excavation sediment sampling, which is included in the Alternative 3 Cost Estimate. The conceptual layout of Alternative 3 is shown in Figure 6-3. The assumptions and components of Alternative 3 include:

- Installation of a cutoff earthen berm to isolate the connection between the Lagoon Kiani Complex Lobe and SWMU 6 lagoon during the dewatering. For cost estimating purpose, it is assumed that a 10-foot long, 2-foot high, and 3-foot wide earthen berm would be installed.
- SWMU 6 lagoon dewatering prior to sediment excavation in relatively dry condition. For cost estimating purpose, it is assumed that an average depth of 3 feet of water in SWMU 6 would require dewatering using multiple perimeter well points and sump pumps during the construction phase. In addition, the cost estimation also assumed that the SWMU 6 lagoon would be able to be dewatered under a flowrate up to 300 gallons per minute without using steelsheet piling. The dewatered water would be treated by settling tanks and granular carbon units to remove suspended solids and trace level organics prior to discharge to Lagoon Kiani Complex Lobe. If sheet piling was determined to be necessary in order to dewater the lagoon, the cost could increase by an estimated $400,000 to $500,000 (assuming perimeter installation to 10 ft bgs and removal following excavation). The details of the lagoon dewatering would be articulated in the Remedial Design and Remedial Action (RD/RA) Work Plan, which would be subject to regulatory review and approval, prepared upon completion of the ROD should this alternative be selected.
- Implementing appropriate temporary erosion control measures (e.g., silt fence) prior to land disturbing activities.
- Excavation, dewatering, and off-site disposal of remaining contaminated sediment (assuming 2 feet of excavation across an area of approximately 130 feet by 120 feet). For cost estimating purpose, post-removal confirmatory sediment sampling for the COCs and waste characterization analysis would be performed. It is assumed that a total of 1,155 cubic yards of dried sediment would be disposed of at an off-island landfill as non-hazardous waste.
- Wetland restoration activities such as additional vegetative enhancement (e.g., seagrass, native salt marsh, and mangroves) along the perimeter and intermittent inundation area to help accelerate establishment of lagoon plant species and associated function as a nursery for fish and invertebrates. The temporary erosion control measures will be removed after the completion of remedial construction (i.e., vegetative enhancement and wetland restoration).
- Pre-construction and post-construction surveys.
- No LTM or LUCs would be needed since contaminated sediment posing unacceptable risk (i.e., above PRGs) would be removed.
- No five-year review would be required because PRGs would be met.

6.4 Alternative 4 – In-situ Sand Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls

Alternative 4 would include in-situ passive capping of the contaminated sediment area with 2 feet of sand to provide physical isolation of sediments, minimize the potential for re-suspension, and reduce potential ecological and human health risks from contaminated sediment exposure and uptake of contaminants into edible aquatic species. The conceptual layout of Alternative 4 is shown in **Figure 6-4**. Alternative 4 involves sand capping. Although this alternative would likely achieve RAO 1 for protection of human exposure to PCBs in fish and crabs relatively quickly, due to the disturbance of the elecological community during the remedial construction,

establishment of a benthic community would essentially be “restarted.” Therefore, for FS cost estimating purposes, it is estimated that additional time (conservatively estimated to be 10 years) would be required to verify RAO 2 was met because it may not be possible to distinguish a developing benthic community from an impaired one (relative to background). However, the actual monitoring duration and protocol will be based on observations made during long-term monitoring. The assumptions and components of Alternative 4 include:

- Implementing appropriate temporary erosion control measures (e.g., silt fence and an inlet rip rap for tidal erosion control) prior to capping.
- In-situ placement of 2 feet of sand over contaminated sediment area (assuming approximately 130 feet by 120 feet; water depth up to 3 feet). It is noted that adding 2 feet of sand to the lagoon would likely reduce the open-water lagoon area to a fraction of its current 0.6-acre size. The rationale for a 2-foot-thick sand cap for Alternative 4 is based on the sediment sand cap thickness (2 to 3 feet) commonly used for sediment capping according to Contaminated Sediment Remediation Guidance document EPA-540-R-05-012 (USEPA, 2005). In addition, a 2-foot-thick sand cap is four times the thickness considered protective of the ecological receptor scenario (typically 6 inches). Further, installing more than 2 feet of sand would likely result in filling in the vast majority of the lagoon.
- Wetland restoration activities such as additional vegetative enhancement (e.g., seagrass, native salt marsh, and mangroves) along the perimeter and intermittent inundation area to help accelerate establishment of lagoon plant species and associated function as a nursery for fish and invertebrates.
- Annual sampling for COCs in cover sediment (top 6 inches) for an assumed 10 years (due to “restarting” the clock for establishment of ecological community) to ensure they remain below the PRGs. For the purposes of the FS cost estimating, it is assumed that five sediment samples for PCB, , lead, and zinc analysis would be collected during each sampling event. The actual monitoring frequency and protocol would be documented in the LTM Work Plan, which would be subject to regulatory agency review and approval.
- Implementing physical barriers (boundary survey, fencing, gates, and signage), and LUCs (deed notations) to restrict unauthorized access and intrusive activities (assumed to be 30 years). It is assumed that an additional 400 linear feet of 6-foot high fence and an additional two signs would be installed around the lagoon. The LUC boundary encompassing SWMU 6 would be surveyed by a professional land surveyor.
- Five-year reviews for 30 years.
- The temporary erosion control measures will be removed after the completion of remedial construction (i.e., wetland restoration).

6.5 Alternative 5 – In-situ Reactive Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls

Alternative 5 would include in-situ reactive capping of the contaminated sediment area with CETCO Reactive Core Matt (RCM) overlain with 6 inches of sand to reduce potential ecological and human health risks from contaminated sediment exposure and uptake of contaminants into edible aquatic species. Specifically, the in-situ RCM capping involves isolation of the benthic environment from contaminated sediments, containment of contaminated sediments by controlling re-suspension and scouring, and reduction of contaminant flux from sediments via adsorption. The RCM consists of two layers of geotextiles bound with non-woven fabric blended with organo-clay and apatite for removal and retardation of PCBs and metals. Because of the use of RCM, this alternative allows for the use of a thinner overlying sand layer (6 inches). Alternative 5 involves reactive capping. Although this alternative would likely achieve RAO 1 for protection of human exposure to PCBs in fish and crabs relatively quickly, due to the disturbance of the elecological community during the remedial construction, establishment of a benthic community would essentially be “restarted.” Therefore, for FS cost estimating purposes, it is estimated that additional time (conservatively estimated to be 10 years) would be required to verify RAO 2 was met because it may not be possible to distinguish a developing benthic community from an

impaired one (relative to background). However, the actual monitoring duration and protocol will be based on observations made during long-term monitoring.

The conceptual layout of Alternative 5 is shown in **Figure 6-5**. The assumptions and components of Alternative 5 include:

- Implementing appropriate temporary erosion control measures (e.g., silt fence and an inlet rip rap for tidal erosion control) prior to capping.
- In-situ placement of RCM (organo clay and apatite blended) and 6 inches of sand over contaminated sediment area (assuming approximately 130 feet by 120 feet; water depth up to 3 feet).
- Wetland restoration activities such as additional vegetative enhancement (e.g., seagrass, native salt marsh, and mangroves) along the perimeter and intermittent inundation area to help accelerate establishment of lagoon plant species and associated function as a nursery for fish and invertebrates.
- Annual sampling for COCs in cover sediment (top 6 inches) for an assumed 10 years (due to "restarting" the clock for establishment of ecological community) to ensure they remain below the PRGs. For the purposes of the FS cost estimating, it is assumed that five sediment samples would be collected and analyzed for PCBs, lead, and zinc analysis during each sampling event. The actual monitoring frequency and protocol would be documented in the LTM Work Plan, which would be subject to regulatory agency review and approval.
- Implementing physical barriers (boundary survey, fencing, gates, and signage), and LUCs (deed notations) to restrict unauthorized access and intrusive activities (assumed to be 30 years). It is assumed that an additional 400 linear feet of 6-foot high fence and an additional two signs would be installed around the lagoon. The LUC boundary encompassing SWMU 6 would be surveyed by a professional land surveyor.
- Five-year reviews for 30 years.
- The temporary erosion control measures will be removed after the completion of remedial construction (i.e., wetland restoration).

6.6 Alternative 6 – Intertidal Forested Wetland Restoration and Land Use Controls

Alternative 6 is designed to eliminate potential human health and ecological exposure pathways by backfilling the SWMU 6 lagoon with an approximately 3 feet of soil cover to post-NTCRA grade. This alternative would eliminate the potential human or ecological exposure to contaminated sediment and achieve both RAOs.

The conceptual layout of Alternative 6 is shown in **Figure 6-6**. The major components and assumptions of Alternative 6 include:

- Installation of a cutoff earthen berm to isolate the connection between the Lagoon Kiani Complex Lobe and SWMU 6 lagoon during the dewatering. For cost estimating purpose, it is assumed that a 10-foot long, 2-foot high, and 3-foot wide earthen berm would be installed.
- SWMU 6 lagoon dewatering prior to sediment excavation in relatively dry condition. For cost estimating purpose, it is assumed that an average depth of 3 feet of water in SWMU 6 would require dewatering using multiple perimeter well points and sump pumps during the construction phase. In addition, the cost estimation also assumed that the SWMU 6 lagoon would be able to be dewatered under a flowrate up to 300 gallons per minute without using steelsheet piling. The dewatered water would be treated by settling tanks and granular carbon units to remove suspended solids and trace level organics prior to discharge to Lagoon Kiani Complex Lobe. If sheet piling was determined to be necessary in order to dewater the lagoon, the cost could increase by an estimated $400,000 to $500,000 (assuming perimeter installation to 10 ft bgs and removal following excavation). The details of the lagoon dewatering would be articulated in the Remedial Design and Remedial Action (RD/RA) Work Plan, which would be subject to regulatory review and approval, prepared upon completion of the ROD should this alternative be selected.

- Implementing appropriate temporary erosion control measures (e.g., silt fence) prior to land disturbing activities.
- Installation of approximately 3 feet of soil cover over the entire SWMU 6 lagoon area (estimated 200 feet by 120 feet; approximately 3,200 loose cubic yards assuming compaction factor of 1.2) to minimize ponding and promote stormwater drainage. Soil adjacent to the site or other borrow source deemed acceptable would be used as backfill. The actual soil depth would depend on site-specific conditions, but would be installed to bring the final land soil surface to an elevation that allows for restoration of the pre-removal-action periodically-inundated wetland.
- Vegetation would be established with native plant species suitable for the habitat, likely a combination of mangrove species, in consultation with USFWS.
- Pre-construction and post-construction surveys.
- LUCs (but no fence) to restrict unauthorized excavation that could potentially return the site back to a lagoon setting with exposed contaminated sediment.
- Five-year reviews for 30 years due to the need for LUCs.

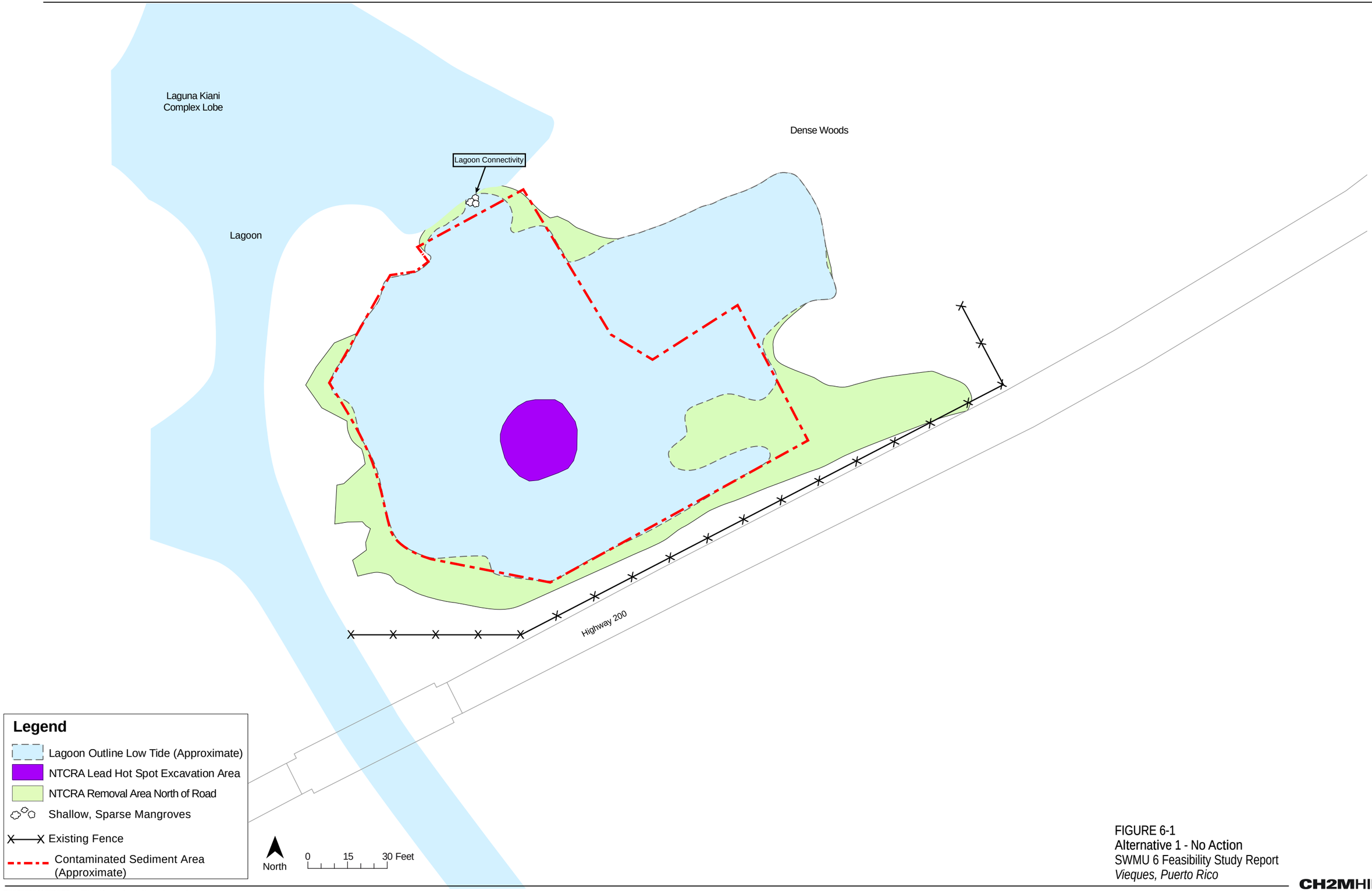


FIGURE 6-1
Alternative 1 - No Action
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

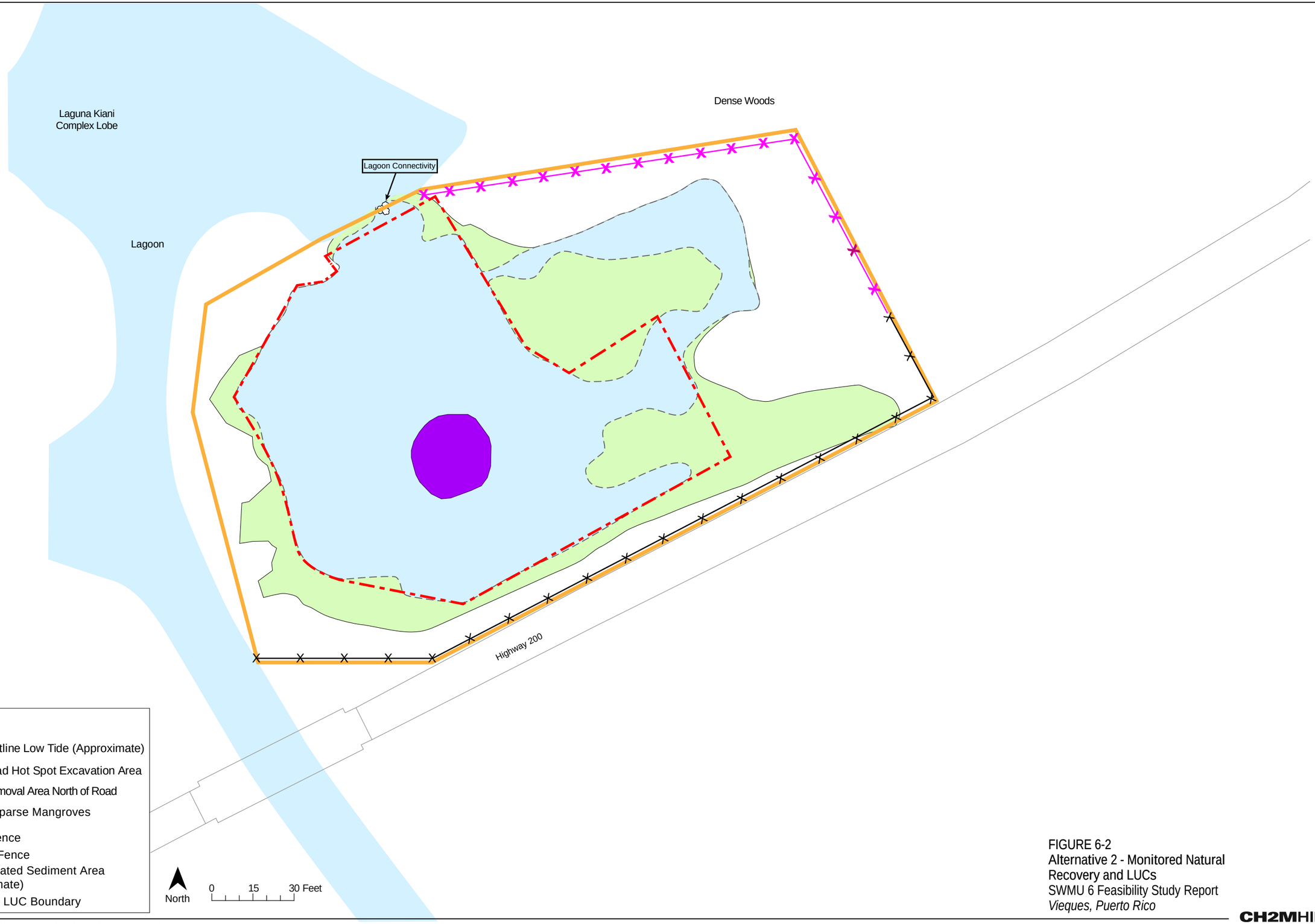


FIGURE 6-2
Alternative 2 - Monitored Natural Recovery and LUCs
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

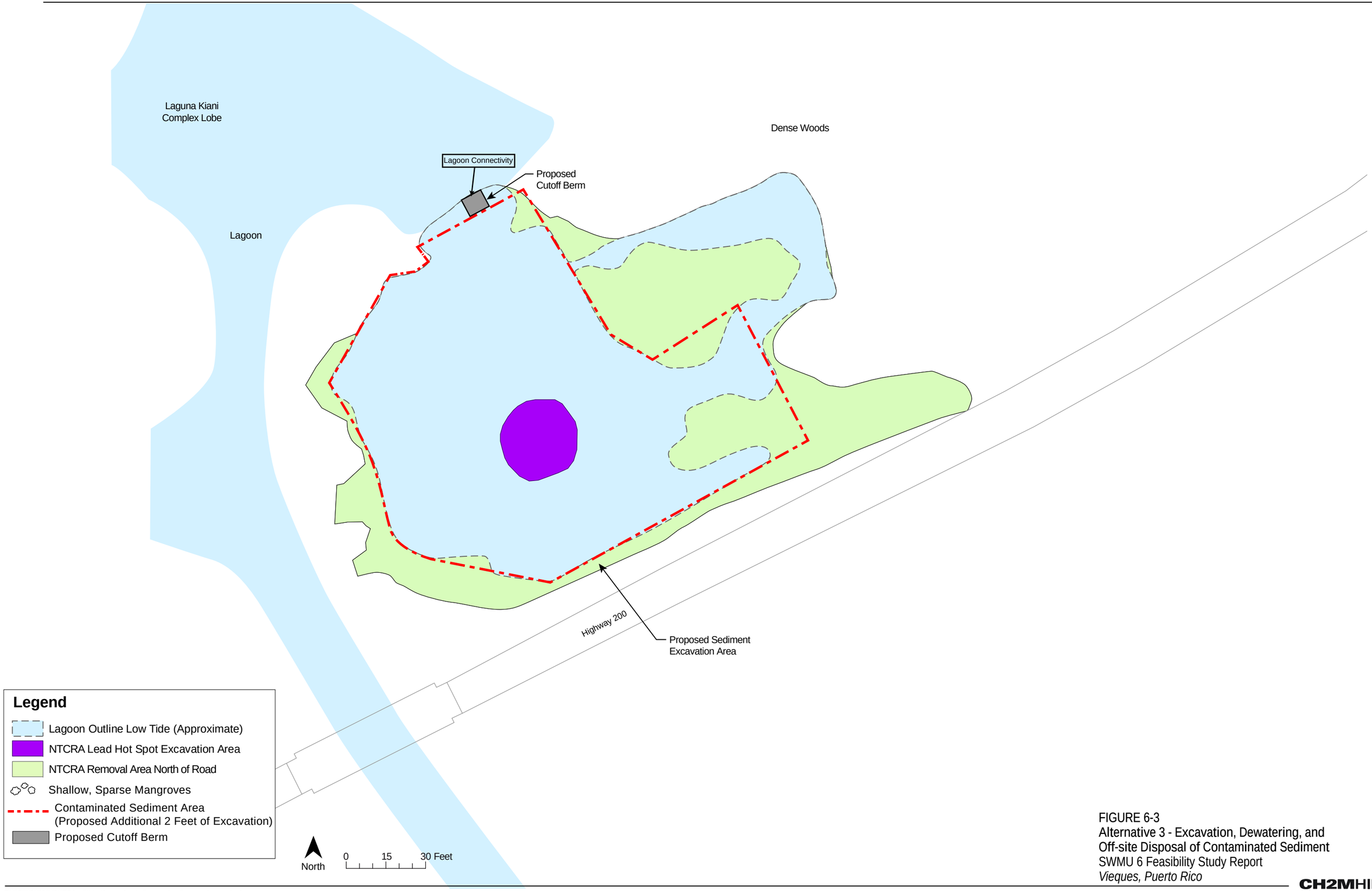


FIGURE 6-3
Alternative 3 - Excavation, Dewatering, and
Off-site Disposal of Contaminated Sediment
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

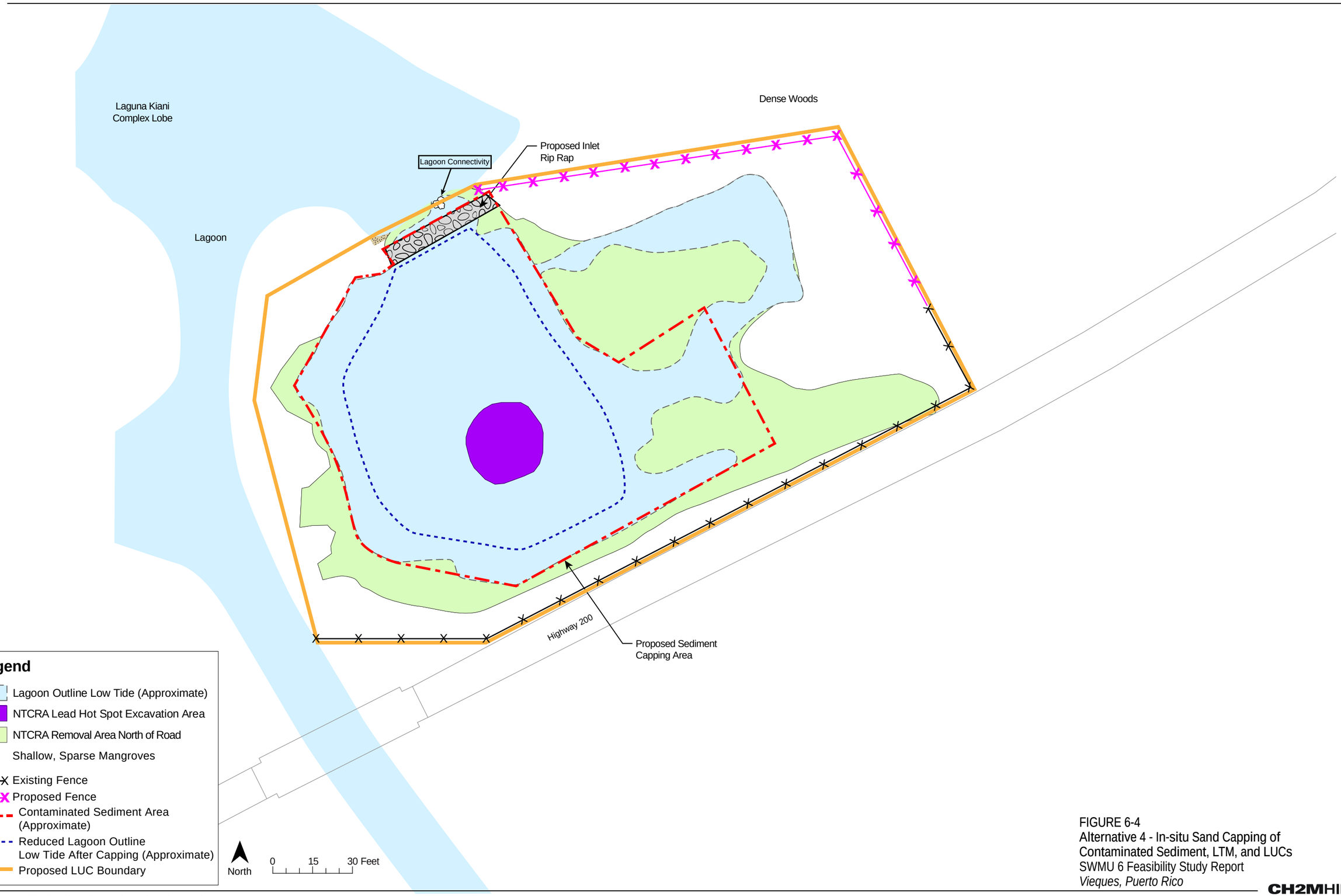


FIGURE 6-4
Alternative 4 - In-situ Sand Capping of Contaminated Sediment, LTM, and LUCs
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

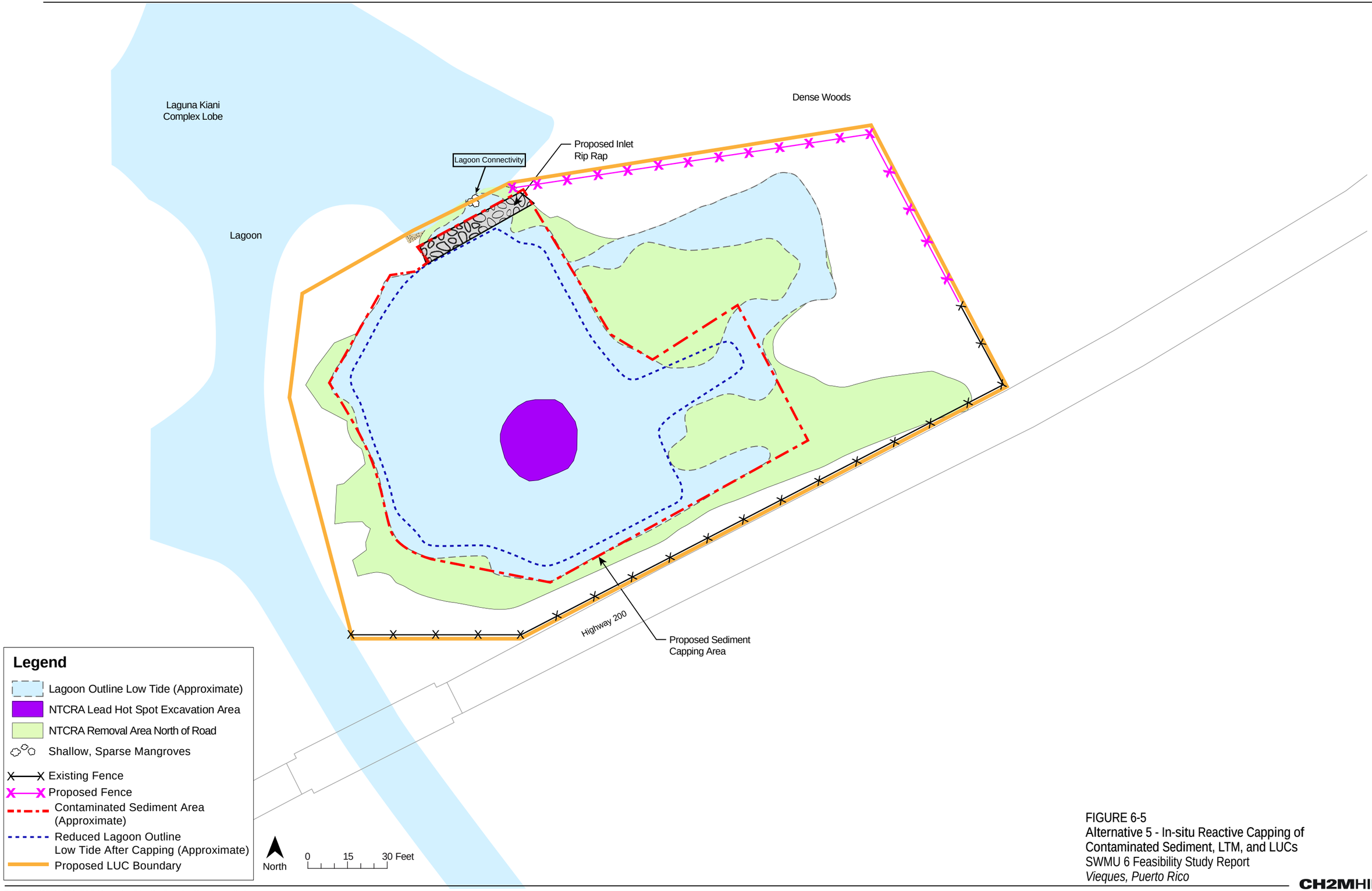


FIGURE 6-5
Alternative 5 - In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

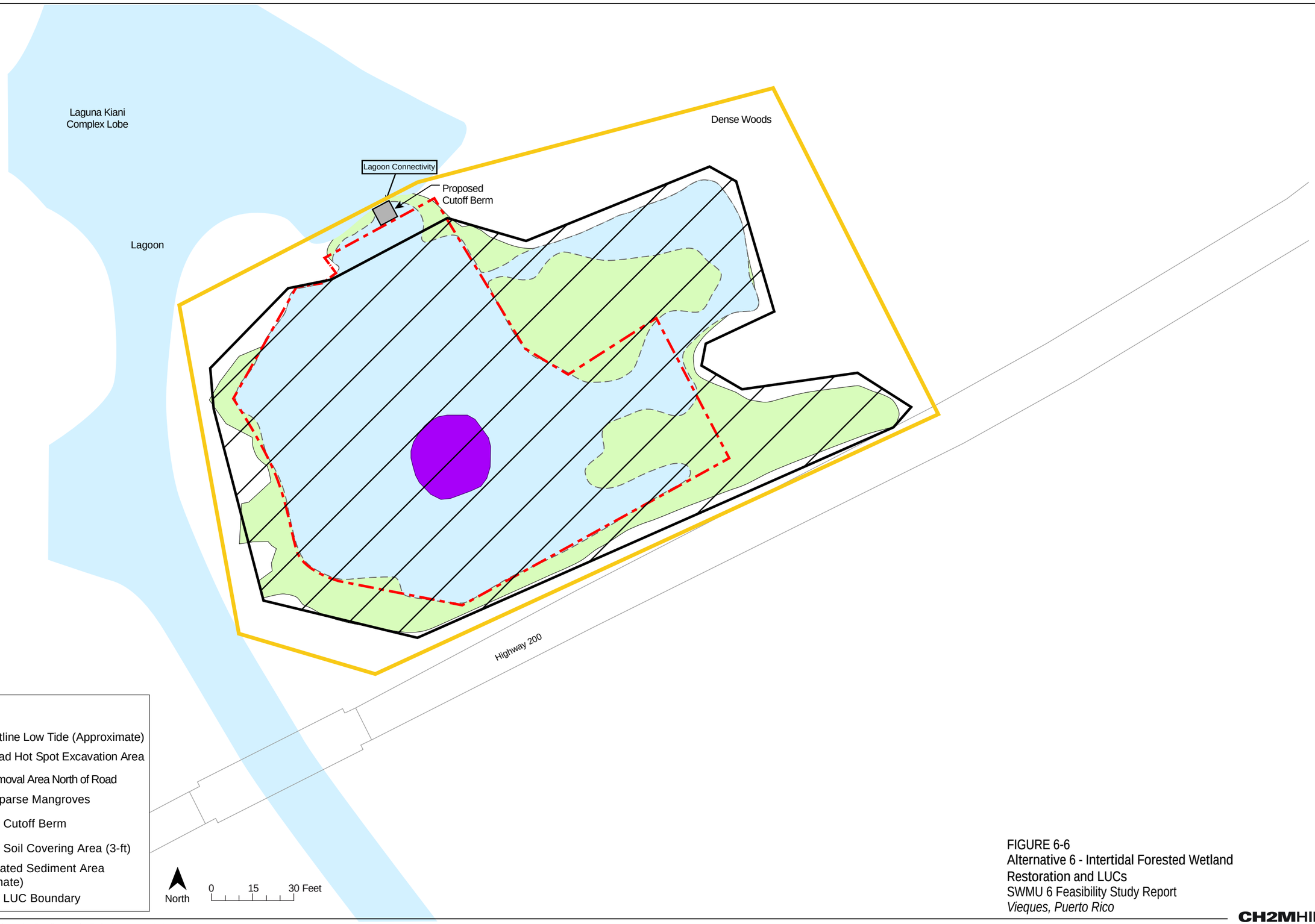


FIGURE 6-6
Alternative 6 - Intertidal Forested Wetland Restoration and LUCs
SWMU 6 Feasibility Study Report
Vieques, Puerto Rico

CH2MHILL

SECTION 7

Detailed Analysis of Remedial Alternatives

This section presents a detailed analysis of the remedial alternatives developed in Section 6. Evaluation of alternatives against criteria is structured according to provisions outlined in the NCP. Alternatives are then compared against one another, to highlight differences and preferential characteristics.

7.1 Evaluation Criteria

CERCLA guidance requires evaluation of each alternative against nine criteria listed in 40 CFR 300.430(e)(9). Criteria were published in the March 8, 1990, *Federal Register* (55 FR 8666), as a basis for comparing relative performance, implementability, and advantages and disadvantages of alternatives. This approach is intended to provide sufficient information for comparison of alternatives, and for selection of the most appropriate site-specific remedial action. Evaluation criteria are listed below:

- Overall protection of human health and the environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume (TMV) through treatment
- Short-term effectiveness
- Implementability
- Cost
- Community acceptance
- State/Commonwealth acceptance

The first two categories from the above list are mandatory criteria for an alternative's consideration, and are referred to as *threshold criteria*. However, alternatives which do not satisfy ARAR requirements *can* be considered if a specific ARAR waiver is granted. The next five categories are the primary criteria upon which the detailed analysis is based, and are referred to as "balancing criteria." The remaining two evaluation categories are considered *modifying criteria* that are to be evaluated following the public comment process. The identified remedial alternatives are evaluated in this FS for the first seven criteria defined below. The two modifying criteria defined below are evaluated via the public comment process on the PRAP.

7.1.1 Threshold Criteria

Threshold criteria are standards that an alternative must meet to be eligible for selection as a remedial action. There is little flexibility in meeting the threshold criteria, in general, the alternative must meet them or it is unacceptable. If ARARs cannot be met, a waiver may be obtained where one or more site exceptions defined in the NCP occur.

- **Overall Protection of Human Health and the Environment.** Protectiveness is the main requirement that remedial actions must meet under CERCLA. It is an assessment of whether an alternative achieves and maintains adequate protection of human health and the environment. A remedy is protective if it eliminates, reduces, or controls all current and potential unacceptable risks posed by the site through each exposure pathway.
- **Compliance with ARARs.** Compliance with ARARs is one of the statutory requirements of remedy selection. This criterion is used to determine whether the alternatives would meet the pertinent applicable federal, state (commonwealth), and local ARARs identified in **Table 5-1**.

7.1.2 Balancing Criteria

Unlike threshold criteria, the five balancing criteria detailed below weigh trade-offs between alternatives. A low rating on one balancing criterion may be compensated by a high rating on another. Balancing criteria represent principles upon which the detailed evaluation and comparative analysis of alternatives is based.

- **Long-Term Effectiveness and Permanence.** CERCLA emphasizes selection of remedies which ensure both short- and long-term protection of human health and the environment. This criterion evaluates residual risks that may persist after implementation of a remedial action (or selection of a 'no further action' alternative). The assessment includes evaluation of the adequacy and reliability of controls. Factors considered appropriate include the following:
  - Magnitude of residual risks as a result of untreated waste, byproducts, or following conclusion of remedial activities. Degree of residual hazards, with respect to TMV and propensity to bioaccumulate, are considered.
  - Adequacy and reliability of controls necessary to manage treatment residuals and untreated waste. Evaluation considers long-term protection from residuals, potential technical modifications that may be required, and potential hazards posed by alternative replacement.
- **Reduction of TMV through Treatment.** This criterion addresses the statutory preference for remedies that employ treatment to significantly reduce the toxicity, mobility, or volume of the hazardous substances. That preference is satisfied when treatment is used to reduce the principal threats at a site by destroying toxic chemicals or reducing the total mass, total volume, or mobility of affected media.
- **Short-Term Effectiveness.** This criterion addresses short-term impacts of the remedial alternatives by examining the effectiveness of alternatives in protecting human health and the environment during construction and implementation activities. Short-term impacts include runoff, dust, vapor, access issues, traffic, potential spills, noise and other byproducts of construction and remedy implementation, until response objectives are achieved. Short-term effects are evaluated against the following considerations:
  - Short-term risks that might be posed to the community during implementation of an alternative.
  - Potential impacts to workers during remedy implementation, including effectiveness and reliability of protective measures.
  - Potential environmental effects from remedy implementation, including effectiveness and reliability of mitigation measures and sustainability.
  - Timeframe for implementation and achieved protection.
- **Implementability.** This criterion evaluates technical and administrative feasibility of an alternative, to include availability of materials and services required for implementation. Implementability is evaluated per the following factors:
  - Technical feasibility, including difficulties and unknowns associated with construction, operation, technological reliability, feasibility of modular upgrades, and ability to monitor remedial effectiveness.
  - Administrative feasibility, including coordination activities, ability to achieve and time required for necessary approvals, and issuance of required permits.
  - Availability of services and materials, as applicable, including: adequate offsite treatment, storage, and disposal capacity; necessary equipment, specialists, manpower, and provisions; prospective and emerging technologies.
- **Cost.** For the detailed cost analysis of alternatives, the expenditures required to complete each measure are estimated in terms of both capital and annual O&M costs. Given these values, a present-worth calculation for each alternative can be calculated for comparison. The cost estimates in this section provide an accuracy of –30 to +50 percent. Costs are projected for up to a period of 30 years in accordance with *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study* (USEPA, 2000b).

Selection of specific technologies utilized in alternative configurations is not intended to limit final design options, but rather provides a baseline for cost estimation. Final cost, and resultant feasibility, depends on actual labor and material costs, competitive market conditions, site conditions, project scope, implementation schedule,

contracted design, and other variables. Due to these factors, project feasibility and funding needs must be reviewed carefully before specific financial decisions are made to help ensure proper evaluation, budget, and adequate funding. Specific details and cost estimates may need to be refined during final remedial design, as applicable.

7.1.3 Modifying Criteria

The following criteria modify selection of recommended alternatives:

- **Community Acceptance.** This assessment includes determination of public opinion, support of, and/or opposition to components of remedial options.
- **State (Commonwealth) Acceptance**. State (commonwealth) concerns taken into consideration include the following:
  - The state's (commonwealth's) position and key interests related to alternatives
  - State (commonwealth) comments on ARARs (or proposed waivers)

Modifying criteria are evaluated following public comment, and as result, community and state (commonwealth) acceptance is not addressed in this FS. State (commonwealth) acceptance and community acceptance criteria will be evaluated by addressing comments received after the USEPA, PREQB, and the public have reviewed site documents (e.g., FS Report, PRAP). This evaluation will be presented in the Responsiveness Summary of the ROD.

The following subsections evaluate remedial alternatives against the first seven criteria described above. Sufficient detail is incorporated into the analysis to understand significant aspects of each alternative, and to identify uncertainties associated with proposed solutions.

7.2 Individual Analysis of Alternatives

The six remedial alternatives described in Section 6 were evaluated in detail using the seven evaluation criteria described in Section 7.1. The six detailed analyses provide the basis of the comparative analysis in Section 7.3. A summary of the detailed analyses is presented in **Table 7-1**.

Detailed cost estimates of the remedial alternatives are provided in **Table 7-2**. **Appendix G** contains the cost estimates of the six remedial alternatives. The alternative cost estimates are in 2012 dollars, based on RS Means and engineer's estimates for similar projects. The cost estimates presented in **Table 7-2** have been developed strictly for comparing the remedial alternatives. The final costs of the project and the resulting feasibility will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, the implementation schedule, and other variables. Therefore, final project costs may vary from the cost estimates. Because of these factors, project feasibility and funding needs should be reviewed carefully before specific financial decisions are made or project budgets are established to help ensure proper project evaluation and adequate funding.

The cost estimates are order-of-magnitude estimates having an intended accuracy range of +50 to -30 percent. The range applies only to the alternatives as they are defined in Section 6 and does not account for changes in the scope of the alternatives. The specific details in remedial actions and cost estimates would be refined during the design.

7.2.1 Criteria Assessment of Alternative 1

Alternative 1—*No Action* provides the baseline for comparing other alternatives. This alternative does not provide sufficient control of human exposure to the potentially contaminated biota via fishing and crabbing because the site is currently partially restricted by a chain-link fence but no additional LUCs would be implemented. This alternative would not determine COC concentrations relative to PRGs, since there would be no monitoring.

Action-specific ARARs are not applicable for this alternative since no action would be undertaken. It would be unknown if SWMU 6 would remain out of compliance with the chemical-specific ARARs because no sediment monitoring would be performed. Five-year reviews for 30 years would be required since sediment contaminated above the PRGs is left in place without monitoring to determine whether the PRGs are met over time.

No documented change in risk because no action would be taken and no monitoring would be performed; therefore, its long-term effectiveness is unknown. Risk would very likely decrease over time via natural processes, but there would be no mechanism to monitor progress.

This alternative would result in unknown TMV since there would be no monitoring of COCs.

No construction or monitoring is associated with this alternative. Short-term impacts would be primarily associated with insignificant impacts during the site inspections required by five-year reviews. No community is located nearby that would be affected. The environmental footprint is the lowest, based on a sustainability analysis using the SiteWiseTM tool (see Appendix H).

Implementability is not applicable.

Taking no action would require no capital costs nor O&M costs. For cost comparison, although five-year reviews are administrative requirement by the NCP rather than an active remedy component, five-year-review costs have been included in the present-worth analysis for Alternative 1. The present worth cost of Alternative 1 is estimated at $139,000, assuming a 30-year period and 4 percent discount rate.

7.2.2 Criteria Assessment of Alternative 2

Alternative 2 – *Monitored Natural Recovery and Land Use Controls* is protective of human health and the environment. MNR in conjunction with LUCs is protective of human health and the environment. Sediment sampling would monitor COC concentration decline via natural mechanisms. Vegetation enhancement would help accelerate establishment of a viable benthic community.

There are no Federal or Puerto Rico action-specific ARARs or Puerto Rico location-specific ARARs for this alternative. This alternative would meet federal location-specific ARARs. This alternative is expected to meet the Federal chemical-specific ARARs within 5 years.

MNR has the potential to achieve a high level of risk reduction. Natural processes, including burial of contaminated sediment by natural deposition, and sequestration of contaminants through biological, chemical, or physical processes, would likely reduce residual risk to acceptable levels in several years. One 5-year review is assumed to be required to assess whether unacceptable risk remains. Additional 5-year reviews would be required if the sediment PRGs had not been met in 5 years. LUCs would reliably control physical disturbance due to human activities, as well as restrict access, fishing and crabbing activities.

Although Alternative 2 is not technically a “treatment” alternative, it does reduce the toxicity, mobility, and volume of contaminants at the site by natural processes, as noted above.

The estimated time-frame for achieving RAO 1 is 5 years; the estimated timeframe to achieve RAO 2 is 10 years. Short-term impacts would be primarily associated with minor impacts during the site inspections required by the five-year review, additional fence installation during the implementation of LUCs, and sediment sampling activities. No community is located nearby that would be affected by the remedy. The environmental footprint is the second lowest (see analysis using the SiteWise^{TM} tool in Appendix H).

No significant technical difficulties or unknowns are associated with the implementation of this alternative. No construction is required other than fence installation and revegetation. Sediment monitoring methods are well-established. LUCs may require administrative resources and local cooperation.

The capital cost of Alternative 2 is primarily associated with implementing LUCs, conducting the sediment monitoring, and vegetation enhancement. The capital cost is estimated to be $213,000. The LTM cost consists primarily of field labor and analytical costs to collect and analyze sediment samples, and office labor to analyze trends and prepare monitoring reports. The present worth cost for annual sediment monitoring is $156,000, and the five-year review cost is $139,000. The present worth for Alternative 2 is $508,000, assuming a 30-year project life. The cost estimate is detailed in Appendix G.

7.2.3 Criteria Assessment of Alternative 3

Alternative 2 – *Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment* is protective of human health and the environment because it removes the contaminated sediment via excavation. However, this alternative would likely kill the biota within the SWMU 6 lagoon during the dewatering and construction.

There are no Puerto Rico location-specific ARARs for this alternative. This alternative would meet federal location-specific and federal and Puerto Rico action-specific ARARs. This alternative is expected to meet the chemical-specific ARARs such as PRGs within during the removal action, if the contaminated sediment above PRGs can be completely removed.

This alternative has the potential for a high level of risk reduction, but it is highly dependent on the depth of contaminated sediment and the ability to remove sediment above the PRGs. Due to the likelihood of sediment suspension and re-deposition during excavation, past experience at similar sites indicates multiple mobilizations may be necessary to remove enough contaminated sediment to achieve the PRGs. There is uncertainty on how deep the excavation would proceed in order to completely remove contamination above PRGs and whether the excavation could be maintained dewatered due to excavating below sea level. For the cost estimating purpose in this FS, it is assumed that dewatering is possible and that 2 feet of additional excavation would be performed to completely remove the contaminated sediment above PRGs. LTM, LUCs, and five-year reviews would not be necessary since contaminated sediment above PRGs would be removed; in this case no further action (NFA) would be required following the remedy implementation.

Although Alternative 3 is not technically a “treatment” alternative, it does reduce the toxicity, mobility, and volume of contaminants at the site by removing contaminated sediment. Reduction of TMV (with consideration of the uncertainty of removing all contaminated sediment above PRGs) may be achieved by removal of assumed additional 2 feet of sediment. It is assumed a total volume of 1,155 cubic yards or 1,730 tons of sediment would be removed.

In general, protection would be achieved within 6 months upon implementation of the remedial action to meet RAO 1, but could take 10 years for benthic community to re-establish itself to meet RAO 2. Short-term impacts would be primarily associated with dewatering, excavation, and waste transport and disposal activities. The primary risk to the community would be associated with the sediment transport during disposal activities. Temporary destruction of the biota would occur during construction activities. Since the existing lagoon would be dewatered, and excavation and waste disposal is involved, this alternative has the potential for worker injury and accident. The potential injury risks associated with dewatering, earthwork, and waste transport/disposal would be managed by implementing proper health and safety procedures. The environmental footprint for this alternative is the highest (see analysis using the SiteWise^{TM} tool in Appendix H).

Installation of an isolation berm between the SWMU 6 lagoon and Laguna Kiani complex is implementable. Excavation equipment and materials are available. Off-site disposal of excavated sediment and soil was shown to be implementable during the 2009 NTCRA, with subcontractors readily available. As noted above, there is uncertainty associated with the technical ability to dewater the lagoon and confirm the required contaminated sediment has been removed. If SWMU 6 lagoon cannot be dewatered to allow “dry” excavation, mechanical dredging using excavator from the bank may be possible, but was not considered as a feasible option (i.e., dredging was not retained during the initial technology screening step of Section 5). This alternative is administratively feasible, in part because the excavation would not involve erosion control permitting substantive requirements due to disturbance of land less than 1 acre.

The capital cost of Alternative 3 is primarily associated with dewatering, sediment excavation and off-site transport and disposal, and vegetation enhancement. No LTM activities are anticipated since the PRGs would be met. The present worth for Alternative 3 is $1,437,000. The cost estimate is detailed in Appendix G.

7.2.4 Criteria Assessment of Alternative 4

Alternative 4 – *In-situ Sand Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls* is protective of human health and the environment. Passive sand capping, in conjunction with LTM and LUCs, can

provide adequate protection. Given the relatively shallow water depth (i.e., several inches up to 3 feet) in the SWMU 6 lagoon, capping with 2 feet of sand would essentially fill most of the lagoon. Temporary to permanent aquatic habitat destruction/disruption would occur, but vegetative enhancements would help ensure recovery of an appropriate habitat. LTM sediment sampling would monitor the effectiveness of sand covering layer as well as COC concentrations (in areas still remaining as lagoon).

There are no Puerto Rico location-specific ARARs for this alternative. This alternative would meet federal location-specific and federal and Puerto Rico action-specific ARARs. This alternative is expected to meet the chemical-specific ARARs such as PRGs within 10 years.

Sand capping has the potential for moderate to high level of risk reduction. The 2 feet of sand layer would isolate the contaminated sediment to reduce the bioavailability and provide long-term residual risk reduction to acceptable levels. Five-year reviews for 30 years would be required for assessment of whether unacceptable risk exists due to contaminated sediment left in place. LUCs would reliably control physical disturbance due to human activities, as well as restrict access, fishing and crabbing activities.

Although Alternative 4 is not technically a “treatment” alternative, reduction of toxicity and mobility of COCs in the sediment is likely through sand covering and other natural process, as described under Alternative 2.

Immediate control of risks due to implementation of LUCs and covering of contaminated sediment to meet RAO 1 within 2 months. The disturbed habitat and biota recovery may take longer time (10 years) to meet RAO 2. Short-term impacts would be primarily associated with site inspections required by the five-year reviews, additional fence installation during the implementation of LUCs, sediment sampling activities, in-situ capping, and transport of sand materials. The local community located nearby would be minimally affected by the remedy during the transport of sand materials. Additional potential impacts to workers during construction include noise and dust. The disturbed habitat and biota may take years to recover (the FS assumes 10 years). The environmental footprint is fourth highest (see analysis using the SiteWise^{TM} tool in Appendix H).

No significant technical difficulties or unknowns are associated with the implementation of this alternative. The sand layer can be placed by excavator bucket through the water column. Sediment sampling methods are well-established. LUCs may require administrative resources and local cooperation.

The capital cost of Alternative 4 is primarily associated with implementing LUCs, conducting LTM, sand capping, and vegetation enhancement. The capital cost is estimated to be $411,000. The LTM cost consists primarily of field labor and analytical costs to collect and analyze the sediment samples, sediment inspection, and office labor to analyze trends and prepare monitoring reports. The present worth cost for annual sediment LTM is $268,000, and the five-year review cost is $139,000. The present worth for Alternative 4 is $818,000, assuming a 30-year project life. The cost estimate is detailed in Appendix G.

7.2.5 Criteria Assessment of Alternative 5

Alternative 5 – *In-situ Reactive Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls* is protective of human health and the environment. Reactive capping using RCM, in conjunction with LTMs and LUCs, provides a high level of protection. RCM capping allows a much thinner layer of sand (6 inches) but provides similar or even a higher level of protection than the sand capping in Alternative 4. Temporary habitat destruction/disruption would occur, but to a lesser degree than the sand capping in Alternative 4 because a larger area of the lagoon would be retained. LTM sediment sampling would monitor the effectiveness of RCM and sand cover (in areas still remaining as lagoon).

There are no Puerto Rico location-specific ARARs for this alternative. This alternative would meet federal location-specific and federal and Puerto Rico action-specific ARARs. This alternative is expected to meet the chemical-specific ARARs such as PRGs within 10 years.

Reactive capping has the potential for a high level of risk reduction. Alternative 5 is the only alternative that technically involves reduction in toxicity through treatment, i.e., adsorption of metals and PCBs via blended organo clay and apatite in the RCM. The RCM (approximately 1 to 2 inches thick) and overlain 6 inches of sand would isolate the contaminated sediment to reduce the bioavailability via adsorption to the organo-clay and apatite

media and provide long-term residual risk reduction to acceptable levels. Five-year reviews for 30 years would be required for assessment of whether unacceptable risk exists due to contaminated sediment left in place. LUCs would reliably control physical disturbance due to human activities, as well as restrict access, fishing and crabbing activities.

Reduction of toxicity and mobility of COCs in the sediment is likely via adsorption by RCM blended with organo-clay and apatite, sand covering, and other natural process, as described under Alternative 2.

Immediate control of risks due to implementation of LUCs and covering of contaminated sediment to meet RAO 1 within 2 months. The disturbed habitat and biota recovery may take longer time (10 years) to meet RAO 2. Short-term impacts would be primarily associated with site inspections required by the five-year reviews, additional fence installation during the implementation of LUCs, sediment sampling activities, in-situ reactive capping, and transport of sand materials. The local community located nearby would be minimally affected by the remedy during the transport of sand materials. Additional potential impacts to workers during construction include noise and dust. The disturbed habitat and biota may take years to recover (the FS assumes 10 years). The environmental footprint is third highest (see analysis using the SiteWise^{TM} tool in Appendix H).

No significant technical difficulties or unknowns are associated with the implementation of this alternative. RCMs are available in large rolls, and deployment of these rolls can be executed with the help of barge-mounted roller, from the shore, or wading through the relatively shallow water (up to 3 feet deep) in the SWMU 6 lagoon. The sand layer can be placed by excavator bucket through the water column. Sediment sampling methods are well-established. LUCs may require administrative resources and local cooperation.

The capital cost of Alternative 5 is primarily associated with implementing LUCs, conducting LTM, RCM and sand capping, and vegetation enhancement. The capital cost is estimated to be $500,000. The LTM cost consists primarily of field labor and analytical costs to collect and analyze the sediment samples, and office labor to analyze trends and prepare monitoring reports. The present worth cost for annual sediment LTM is $268,000, and the 5-year review cost is $139,000. The present worth for Alternative 5 is $907,000, assuming a 30-year project life. The cost estimate is detailed in Appendix G.

7.2.6 Criteria Assessment of Alternative 6

Alternative 6 – *Intertidal Forested Wetland Restoration and Land Use Controls* is protective of human health and the environment because placement of 3 feet of soil would eliminate the open water lagoon and associated biota exposure pathway. The site would be restored to original intermittently inundated black mangrove habitat conditions.

There are no Puerto Rico location-specific ARARs for this alternative. This alternative would meet federal location-specific and federal and Puerto Rico action-specific ARARs. This alternative is expected to meet the chemical-specific ARARs such as PRGs immediately upon completion of the remedial action.

Potential risks would no longer exist due to elimination of exposure pathways. LUCs to restrict unauthorized excavation are required due to the presence of contaminated sediment beneath the cover. Five-year reviews for 30 years are required due to the need for LUCs.

Although Alternative 6 is not technically a “treatment” alternative, it does reduce the toxicity, mobility, and volume of contaminants at the site through soil covering and other natural process, as described under Alternative 2.

Immediately control of risks upon implementation to meet RAO 1 within 6 months. RAO 2 is not applicable. Short-term impacts would be primarily associated with dewatering and soil cover construction. Since the existing lagoon would be dewatered, and soil covering is involved, this alternative has potential risk for worker injury and accident. Additional potential impacts to workers during construction include noise and dust. The local community located nearby would be minimally affected by the remedy during the transport of cover materials. The environmental footprint is second highest (see analysis using the SiteWise^{TM} tool in Appendix H).

Technical difficulties are associated with the feasibility of dewatering. If complete dewatering is not achievable, backfilling may be possible from the bank with granular fill materials (such as crushed gravel, rock, limestone or other applicable backfill materials) followed by soil covering, working toward the lagoon.

The capital cost of $896,000 for Alternative 6 is primarily associated with dewatering, backfilling, and vegetation enhancement. The 5-year review cost is $139,000. No LTM or O&M would be necessary. The present worth for Alternative 6 is $1,035,000, assuming a 30-year project life. The cost estimate is detailed in Appendix G.

7.3 Comparative Analysis of Alternatives

This section provides a comparative analysis of the remedial alternatives. A comparative analysis was conducted for the alternatives, relative to one another, with respect to each NCP evaluation criteria, as shown in Table 7-3. The purpose of this analysis is to demonstrate the relative advantages and disadvantages of each remedial alternative, so that key tradeoffs can be assessed during the decision–making process. A summary of the comparative analysis is presented below.

7.3.1 Overall Protection of Human Health and the Environment

Alternative 1 is not protective of human health and environment, in part because this alternative would not verify the protectiveness. All the remaining five alternatives are protective of human health and the environment. Even though the marine environment is eliminated by Alternative 6, it is replaced by as viable a terrestrial environment.

7.3.2 Compliance with ARARs

Table 5-1 presents a compilation and evaluation of state (Commonwealth) and federal chemical-specific, location-specific, and action-specific ARARs. All the Alternatives but Alternative 1 meet the ARARs.

7.3.3 Long-Term Effectiveness and Permanence

Alternative 1 does not provide the ability to determine long-term effectiveness. Alternatives 2, 4, and 5 are effective in the long-term to achieve acceptable risk reduction by MNR, passive capping, or reactive capping, respectively, in conjunction with LUCs to restrict access to the lagoon area and monitoring associated with the sediment PRGs. Alternative 6 is effective in eliminating potentially unacceptable risks by covering the lagoon with soil to restore the site to original mangrove habitat conditions. Alternative 3 has potential for a high level of risk reduction via sediment excavation, but has significant uncertainty due to the depth of contaminated sediment requiring removal and potential for suspension and redistribution of contaminated sediment. Although the cost estimate for the FS assumes an average 2 feet of excavation, excavation beyond 2 feet deep may be required depending on the depth of contaminated sediment and potential for contaminated sediment redistribution.

Five-Year Reviews for an estimated 30 years (or longer) are required for Alternatives 1, 2, 4, 5, and 6 due to the potential for contaminated sediment posing unacceptable risks to remain. No 5-year reviews are required for Alternative 3 because it theoretically results in a NFA determination. Alternative 3 would achieve project closeout in a predictable timeframe following the CERCLA process, but there is uncertainty regarding how deep the excavation would proceed and how many mobilizations would be necessary in order to completely remove the contaminated sediment above PRGs and there is technical uncertainty regarding whether the excavation could be maintained dewatered due to the additional excavation being below sea level.

7.3.4 Reduction of TMV Through Treatment

Alternative 2 provides a relatively low level of toxicity and mobility reduction due to natural processes acting on the contaminated sediment. Alternatives 4, 5, and 6 provide a somewhat higher level of toxicity and mobility reduction due to application of cover material in addition to natural processes. Alternative 3 provides a higher degree of reduction toxicity and mobility through contaminated sediment removal.

7.3.5 Short-Term Effectiveness

Potential impacts to the workers, community, and the environment are in the order below (from low to high): Alternative 1 < Alternative 2 < Alternative 5 < Alternative 4 < Alternative 6 < Alternative 3.

A sustainability analysis of the six alternatives was conducted using the SiteWise™ tool (see **Appendix H**). The alternatives with the lower environmental footprint are considered more sustainable compared to the other alternatives. Alternative 1 had the lowest environmental footprint in terms of projected GHG emissions and energy consumptions among all of the alternatives considered. However, as noted previously, this alternative does not meet the RAOs. The environmental footprint in terms of GHG, NOx, SOx, PM10 emissions, and total energy used follow the order (low to highest): Alternative 1 < Alternative 2 < Alternative 4 < Alternative 5 < Alternative 6 < Alternative 3. Accident risks for fatality and injury follow the order (low to highest): Alternative 1 < Alternative 2 < Alternative 5 < Alternative 6 < Alternative 4 < Alternative 3.

7.3.6 Implementability

Since Alternative 1 is the No Action alternative and does not meet RAOs, it would be difficult to obtain administrative approval for this alternative. The impementability is in the order below (from easy to difficult): Alternative 2 < Alternative 4 < Alternative 5 < Alternative 6 < Alternative 3. The major technical challenge for Alternatives 3 and 6 is the SWMU 6 lagoon dewatering capability to allow for construction work in a relatively dry environment, considering the site is at sea level. Although soil backfilling could be performed from the bank for Alternative 6, sediment suspension would be a concern during the remedial action.

7.3.7 Cost

Based on the present worth analysis, the cost of the six alternatives is in the order (low to high): Alternative 1 < Alternative 2 < Alternative 4 < Alternative 6 < Alternative 5 < Alternative 3.

TABLE 7-1
Detailed Evaluation of Remedial Alternatives
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Evaluation Criteria	Alternative 1 - No Action	Alternative 2 - Monitored Natural Recovery and LUCs	Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment	Alternative 4 - In-situ Sand Capping of Contaminated Sediment, LTM, and LUCs	Alternative 5 - In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs	Alternative 6 - Intertidal Forested Wetland Restoration and LUCs
Overall Protection to Human Health and the Environment						
RAO 1 - Prevent human exposure to PCBs in edible-size fish and blue crab at concentrations that may pose unacceptable risk	Not protective. No monitoring would be conducted to ensure protectiveness. The No Action Alternative would not completely and sufficiently deter trespassing and fishing and crabbing at the lagoon under the current condition, because the site is currently partially restricted by chain-link fence, but no additional LUCs would be implemented.	This alternative will meet RAO 1 in part because additional fence would be installed to restrict access and fishing/crabbing activities. Deed notations would also be implemented. Periodic sediment sampling would be performed to evaluate COC concentrations relative to PRG. In addition, MNR provides protection through natural recovery process (natural sediment deposition, dispersion, biodegradation, and adsorption by natural organic matter etc.) in conjunction with LTM and LUCs. Plant uptake may not be effective for all COCs.	This alternative will meet RAO 1 by completely removing contaminated sediment above PRG. However, this alternative will kill the existing fish and blue crabs within the SWMU 6 lagoon during the construction. Can provide high level of protection, depending on whether the contaminated sediment above PRGs can be reliably removed.	This alternative will meet RAO 1 by installing a passive sand cap over the contaminated sediment area, as well as the natural processes identified in Alternative 1. Additional fence would be installed to restrict access and fishing/crabbing activities.	This alternative will meet RAO 1 by installing a reactive cap over the contaminated sediment area, as well as the natural processes identified in Alternative 1. Additional fence would be installed to restrict access and fishing/crabbing activities.	This alternative will meet RAO 1 because placement of 3 feet of soil would eliminate the exposure pathways. The site would be restored to original intermittently inundated black mangrove habitat conditions (near terrestrial).
RAO 2 - Encourage development of a benthic community that reflects the physical environment represented by the SWMU 6 habitat relative to surrounding marine habitats	Not protective. Although impaired sediment might recover within 5 to 10 years, there is no monitoring to verify the protectiveness.	This alternative will meet RAO 2 through natural recovery process (natural sediment deposition, dispersion, biodegradation, and adsorption by natural organic matter etc.). Sediment sampling would be performed to evaluate COC concentrations relative to PRGs. Vegetation enhancement would help accelerate establishment of healthy benthic community.	This alternative will meet RAO 2 by removing contaminants above PRGs. However, same uncertainty as noted above.	This alternative will meet RAO 2 for the same reason as above. However, installation of the sediment cap would cause temporary damage/destruction to the benthic community, requiring it to re-establish following remedy implementation. Sediment sampling would be performed to evaluate COC concentrations relative to PRGs. Vegetation enhancement would help accelerate establishment of healthy benthic community. However, it is noted that installation of 2 feet of sand will fill in the majority of the lagoon, leaving only a fraction of the current open water, lagoon footprint.	This alternative will meet RAO 2 for the same reason as above. However, installation of the sediment cap would cause temporary damage/destruction to the benthic community, requiring it to re-establish following remedy implementation. Sediment sampling would be performed to evaluate COC concentrations relative to PRGs. Vegetation enhancement would help accelerate establishment of healthy benthic community. However, it is noted that installation of RCM and 6 inches of sand will reduce the open-water footprint due to the shallow nature of the lagoon.	RAO 2 is not applicable for Alternative 6.
Compliance with ARARs						
Location-specific ARARs	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.
Action-specific ARARs	Not Applicable.	Not Applicable.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.
Chemical-specific ARARs	Unknown.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.
Long-Term Effectiveness and Permanence						
Magnitude of Residual Risks	Magnitude of residual risks not known because no monitoring would occur.	Potential for high level of risk reduction by natural recovery and LUCs.	Potential for high level of risk reduction via removal, but highly dependent on the depth of contaminated sediment, ability to remove sediment above PRGs, and ability to dewater lagoon.	Potential for high level of risk reduction by sand capping, additional natural processes, and LUCs.	Potential for high level of risk reduction via reactive RCM and sand capping, additional natural processes, and LUCs.	Negligible residual risk (only if soil cover was removed and lagoon re-created) due to elimination of exposure pathways.

TABLE 7-1
Detailed Evaluation of Remedial Alternatives
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Evaluation Criteria	Alternative 1 - No Action	Alternative 2 - Monitored Natural Recovery and LUCs	Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment	Alternative 4 - In-situ Sand Capping of Contaminated Sediment, LTM, and LUCs	Alternative 5 - In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs	Alternative 6 - Intertidal Forested Wetland Restoration and LUCs
Adequacy and Reliability of Controls	Access to the site is partially restricted, but no additional LUCs would be implemented, so controls are inadequate and unreliable.	LUCs would reliably control physical disturbance due to unauthorized access and intrusive activities.	Excavation goal is to remove contaminated sediment above PRGs; therefore, LTM and LUCs not necessary.	LUCs would reliably control physical disturbance due to unauthorized access and intrusive activities.	LUCs would reliably control physical disturbance due to unauthorized access and intrusive activities.	LUCs to restrict unauthorized excavation to return the site back into a lagoon are required due to the presence of contaminated sediment beneath the cover. However, no fence would be necessary.
Need for 5-year review	5-year reviews for estimated 30 years	5-year reviews for estimated 30 years due to the need for LUCs to restrict unauthorized intrusive activities that could disturb the sediment deposition layer	No 5-year reviews because the PRGs are met by remedial action.	5-year reviews for estimated 30 years due to the need for LUCs to restrict unauthorized intrusive activities that could disturb the cap.	5-year reviews for estimated 30 years due to the need for LUCs to restrict unauthorized intrusive activities that could disturb the cap.	5-year review for estimated 30 years due to the need for LUCs.
Reduction of Toxicity, Mobility, or Volume (TMV) Through Treatment						
Reduction of TMV Through Treatment	Unknown due to no monitoring.	No toxicity and mobility reduction through active treatment. TMV reduction likely due to natural processes (sediment deposition, dispersion, biodegradation, and adsorption by natural organic matter etc.).	No reduction in TMV through treatment. Reduction of TMV by removal of contaminated sediment above PRGs. However, technical challenges may limit the actual TMV reduction.	No TMV reduction through active treatment. Toxicity and mobility reduction due to capping and natural processes (sediment deposition, dispersion, biodegradation, and adsorption by natural organic matter etc.).	Reduction of TMV through active treatment is only involved in Alternative 5. Toxicity and mobility reduction due to capping and natural processes (sediment deposition, dispersion, biodegradation), and adsorption by natural organic matter etc.).	No TMV reduction through treatment. Toxicity and mobility reduction due to soil covering.
Short-Term Effectiveness						
Potential impacts to workers during remedial action and the effectiveness and reliability of protective measures	None.	LUCs would likely require administrative resources and local co-operation. Fence and signage installation easily constructed with normal health and safety procedures.	Since the existing lagoon would be partly to wholly dewatered and excavation and waste disposal are involved, this alternative has relatively high potential risk for injury and accident. The potential injury risks associated with this alternative for dewatering, earthwork, and waste transport and disposal would be managed by implementing proper health and safety procedures.	LUCs would likely require administrative resources and local co-operation. Fence and signage installation easily constructed with normal health and safety procedures. However, there would be potential impacts to workers during heavy machinery use during capping.	LUCs would likely require administrative resources and local co-operation. Fence and signage installation easily constructed with normal health and safety procedures. However, there would be potential impacts to workers during heavy machinery use during capping.	Since the existing lagoon would be dewatered, and soil covering is involved, this alternative has potential risk for injury and accident. The potential injury risks associated with this alternative for dewatering and earthwork would be managed by implementing proper health and safety procedures.
Short-term risk that might be posed to the community during implementation	Not applicable.	None.	The primary risk to the community would be associated with the contaminated sediment transport through the community during disposal activities.	Relatively minor impact to community associated with transporting capping materials through the community.	Relatively minor impact to community associated with transporting capping materials through the community.	Relatively minor impact to community associated with transporting soil filling materials through the community.
Potential environmental impacts of remedial action and effectiveness and reliability of mitigation measures during implementation	None.	Minimal associated with fence installation and LTM.	Temporary destruction of the ecological community during excavation activities.	Temporary impairment/destruction of the benthic community during construction activities.	Temporary impairment/destruction of the benthic community during construction activities.	Destruction of marine ecology, but replaced with equally viable terrestrial ecology.

TABLE 7-1
Detailed Evaluation of Remedial Alternatives
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Evaluation Criteria	Alternative 1 - No Action	Alternative 2 - Monitored Natural Recovery and LUCs	Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment	Alternative 4 - In-situ Sand Capping of Contaminated Sediment, LTM, and LUCs	Alternative 5 - In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs	Alternative 6 - Intertidal Forested Wetland Restoration and LUCs
Time until protection is achieved	Unknown	The estimated time-frame for achieving RAO 1 is 5 years; the estimated timeframe to achieve RAO 2 is 10 years.	In general, protection would be achieved within 6 months upon implementation of the remedial action to meet RAO 1, but could take 10 years for benthic community to re-establish itself to meet RAO 2. In addition, as noted above, there are significant technical challenges that may lead to uncertainty in achieving the PRGs, especially in a single mobilization.	Immediate control of risks due to implementation of LUCs and covering of contaminated sediment to meet RAO 1 within 2 months. The disturbed habitat and biota recovery may take longer time (10 years) to meet RAO 2; however, lagoon footprint would be only a fraction of its current footprint.	Immediate control of risks due to implementation of LUCs and covering of contaminated sediment to meet RAO 1 within 2 months. The disturbed habitat and biota recovery may take longer time (10 years) to meet RAO 2; however, lagoon footprint would be smaller than its current footprint.	Immediately control of risks upon implementation to meet RAO 1 within 6 months. RAO 2 is not applicable.
Environmental Footprint (In terms of GHG emissions and energy consumption)	Lowest	Second lowest	Highest	Third lowest	Third highest	Second Highest
Implementability						
Technical feasibility	Not applicable.	Fence installation readily implemented. Sediment sampling methods already established.	Services and materials are available. Significant technical challenge due to unknown depth of removal, ability to dewater, and potential for suspension and re-deposition of contaminated sediment.	Services and materials are available and relatively easily implemented. Most significant challenge would likely be finding a local source of sand.	Services and materials are available and relatively easily implemented. Most significant challenge would likely be finding a local source of sand.	Services and equipment readily available. Technical challenges due to ability to dewater and finding local source of fill soil.
Administrative feasibility	Agency approval unlikely.	Feasible; LUCs would likely require administrative resources and local cooperation.	Feasible.	Feasible.	Feasible.	Feasible.
Availability of services, equipment, and materials	Not applicable.	See above.	See above.	See above.	See above.	See above.
Cost						
(See Table 7-2 for Cost Breakdown)	Very Low	Low	Very High	Medium-High	High	High

Notes:
LTM – Long-term Monitoring
LUC – Land Use Control
RAO – Remedial Action Objective

Table 7-2
Summary of Cost Estimates for Remedial Alternatives
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Alternatives	Alternative 1 - No Action	Alternative 2 - Monitored Natural Recovery and LUCs	Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment	Alternative 4 - In-Situ Sand Capping of Contaminated Sediment, LTM, and LUCs	Alternative 5 - In-Situ Reactive Capping of Contaminated Sediment, LTM, and LUCs	Alternative 6 - Intertidal Forested Wetland Restoration and LUCs
RA Time (Years)	30	30	<3	30	30	30
Total Capital Cost	$0	$213,000	$1,437,000	$411,000	$500,000	$896,000
Total O&M & Periodic Cost (NPV)	$139,000	$295,000	$0	$407,000	$407,000	$139,000
Total Project Cost (NPV in 2012 $)	$139,000	$508,000	$1,437,000	$818,000	$907,000	$1,035,000

Note: Net Present Value (NPV) is based on discount rate of 4%.

TABLE 7-3
Comparative Analysis of Remedial Alternatives
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Criteria	Alternative 1 - No Action	Alternative 2 - Monitored Natural Recovery and LUCs	Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment	Alternative 4 - In-situ Sand Capping of Contaminated Sediment, LTM, and LUCs	Alternative 5 - In-situ Reactive Capping of Contaminated Sediment, LTM, and LUCs	Alternative 6 - Intertidal Forested Wetland Restoration and LUCs
Overall protection of human health and the environment	○	●	●	●	●	●
Compliance with ARARs	○	●	●	●	●	●
Long-term effectiveness and permanence	◔	◕	◕	◕	◕	●
Reduction of toxicity, mobility, or volume through treatment	○	◔	◕	◒	◒	◒
Short-term effectiveness[1]	○	◕	◔	◒	◒	◕
Implementability	○	●	◔	◕	◕	◒
Cost (Net Present Value 2012)[2]	$139,000	$508,000	$1,437,000	$818,000	$907,000	$1,035,000

Notes:

Individual criterion scores: ○ – not met, ◔ – poor, ◒ – satisfactory, ◕ – good, ● – excellent/fully meets.

Rankings are provided as qualitative descriptions of the relative compliance of each alternative with the criteria.

Alternatives 2, 3, 4, and 6 are not technically “treatment” alternatives, but employ technologies that affect toxicity and/or mobility and/or volume of contaminants.

1 The remedial timeframe and sustainability footprint in terms of projected greenhouse gas (GHG) emissions, air emissions, energy consumptions, and accident risk were factored in the scoring of each alternative.

2 The cost represents a +50/-30% range of accuracy, based on estimates prepared in accordance with USEPA cost estimating guidance.

SECTION 8

References

Buchman, M.F. 2008. *NOAA Screening Quick Reference Tables.* NOAA OR&R Report 08-1, Seattle, WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration. 34 pp.

CH2M HILL. 2000. *Final Expanded Preliminary Assessment/Site Investigation*, *U.S. Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico*. October.

CH2M HILL, 2002. *Soil, Surface Water, and Sediment Background Investigation Report, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico*. October.

CH2M HILL, 2007. *Final Remedial Investigation Report, Solid Waste Management Unit (SWMU) 6, Former Naval Ammunition Support Detachment*, *Vieques Island, Puerto Rico*. February.

CH2M HILL 2008a. *Pre-Removal Waste Characterization Human Health Risk Assessment for SWMU 6*, *U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico*. October.

CH2M HILL 2008b. *Pre-Removal Waste Characterization Ecological Risk Assessment for AOCs J and R, SWMUs 6 and 7*, *U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico.* October.

CH2M HILL, 2008c. *Technical Memorandum, Determination of the Disposition of Excavated Soils at SWMU 6, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico*. December.

CH2M HILL. 2010a. *Final Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Solid Waste Management Unit (SWMU) 6, Former Naval Ammunition Support Detachment Vieques , Puerto Rico*. December 2010.

CH2M HILL. 2010b. *Master Standard Operating Procedures, Protocols, and Plans*, Environmental Restoration Program, Vieques, Puerto Rico. April.

CH2M HILL, Inc. 2010c. *Master Ecological Risk Assessment Protocol for Vieques Environmental Restoration Program – Update 1 (Addendum)*. Draft. August.

CH2M HILL, 2011a. *SWMU 6 Human Health Risk Assessment Pre-interim Deliverable (Tables and Figures)*. October.

CH2M HILL, Inc. 2011b. *Draft Interim Deliverable for the Ecological Risk Assessment – SWMU 6, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico*. June.

CH2M HILL, Inc. 2011c. *Background Study for Vieques SWMU 6*. November.

CH2M HILL, 2012. *Final Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Addendum, SWMU 6, Former Naval Ammunition Support Detachment Vieques, Puerto Rico.* January.

Chief of Naval Operations (CNO). 1999. *Navy Policy for Conducting Ecological Risk Assessments.* Memorandum from Chief of Naval Operations to Commander, Naval Facilities Engineering Command. Ser N453E/9U595355.

Department of the Navy (DON). 2001. *Quitclaim Deed (Segregation, Description of Remnant, Conveyance, Constitution of Easements and Constitution of Restrictive Covenants)*. April 30.

Jones, D.S., G.W. Suter II, and R.N. Hull. 1997. *Toxicological benchmarks for screening contaminants of potential concern for effects on sediment-associated biota: 1997 revision.* Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-95/R4.

Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. *Environmental Management.* 19:81-97.

Naval Facilities Engineering Command (NAVFAC). 2003. *Navy guidance for conducting ecological risk assessments.* http://web.ead.anl.gov/ecorisk/. February.

Naval Facilities *Engineering Command (NAVFAC). 2010. Guidance for Preparing a Remedial Alternative Analysis (RAA) Document issued August 30, 2010.*

Program Management Company, 2000. *Final Environmental Baseline Survey, Naval Ammunition Support Detachment, Vieques, Puerto Rico*. October.

Shaw Environmental and Infrastructure, Inc. [Shaw], 2007. *Final Work Plan, Removal Actions, SWMU 6, SWMU 7, AOC J, and AOC R, Former Naval Support Detachment, Vieques, Puerto Rico*. December.

Shaw, 2010. *Final Completion Report, Removal Actions SWMU 6, SWMU 7, AOC J, and AOC R, Former Naval Ammunitions Support Detachment, Vieques, Puerto Rico*. March.

USEPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. EPA/540/G-89/004. October.

USEPA. 1989. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A).* Office of Emergency and Remedial Response. EPA/540/1-89/002. December.

USEPA. 1991. *Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors.* Interim Final. OSWER Directive 9285.6-03.

USEPA. 1997. *Exposure Factors Handbook*. Office of Research and Development. EPA/600/P-95/002F. August.

USEPA. 2000a. *Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups.* EPA 540-F-00-005. September.

USEPA. 2000b. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study,* EPA 540-R-00-002. July.

USEPA. 2001. *Risk Assessment Guidance for Superfund (RAGS); Volume I - Human Health Evaluation Manual* (Part D, Standardized Planning, Reporting and Review of Superfund Risk Assessments). Final. December.

USEPA. 2004. *Risk Assessment Guidance for Superfund, Volume I: HHEM (Part E, Supplemental Guidance for Dermal Risk Assessment).* Final. EPA/540/R-99/005. July.

USEPA, 2005. *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, Office of Solid Waste and Emergency Response, EPA-540-R-05-012.* December.

USEPA. 2008. *Green Remediation: Incorporating Sustainable Environmental Practices into Remediation of Contaminated Sites.* EPA 542-R-08-002. April.

USEPA. 2009. *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment).* EPA-540-R-070-002. OSWER 9285.7.82. January.

United States Department of Defense (DoD). 2009. *Consideration of Green and Sustainable Remediation Practices in the Defense Environmental Restoration Program* (memorandum). August.

United States Department of Energy (DOE). 2000. *Institutional Controls in CERCLA and RCRA Response Actions.* DOE/EH-413-0004. August.

Appendix A
Post-Removal Surface Soil, Sediment, and Surface Water Data Tables

Appendix A
Surface Soil Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-SO132	VWW06-SO136	VWW06-SO137	VWW06-SO142	VWW06-SS012	VWW06-SS013	
Sample ID	116701-06-Z-132	116701-06-Z-136	116701-06-Z-137	116701-06-Z-142	VWW06-SS012-0211	VWW06-SS013-0211	VWW06-SS013P-0211
Sample Date	06/24/09	06/24/09	06/24/09	06/24/09	02/07/11	02/07/11	02/07/11
Chemical Name							
Volatile Organic Compounds (UG/KG)							
1,1,1-Trichloroethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
1,1,2,2-Tetrachloroethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
1,1,2-Trichloroethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
1,1-Dichloroethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
1,1-Dichloroethene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
1,2,4-Trichlorobenzene	190 U	190 U	240 U	220 U	NA	NA	NA
1,2-Dichlorobenzene	190 U	190 U	240 U	220 U	NA	NA	NA
1,2-Dichloroethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
1,2-Dichloropropane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
1,3-Dichlorobenzene	190 U	190 U	240 U	220 U	NA	NA	NA
1,4-Dichlorobenzene	190 U	190 U	240 U	220 U	NA	NA	NA
2-Butanone	32 U	33 U	27 U	33 U	NA	NA	NA
2-Hexanone	32 U	33 U	27 U	33 U	NA	NA	NA
4-Methyl-2-pentanone	32 U	33 U	27 U	33 U	NA	NA	NA
Acetone	64 UJ	66 UJ	54 UJ	67 UJ	NA	NA	NA
Benzene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Bromodichloromethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Bromoform	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Bromomethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Carbon disulfide	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Carbon tetrachloride	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Chlorobenzene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Chloroethane	6.4 U	6.6 U	5.4 U	6.7 UJ	NA	NA	NA
Chloroform	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Chloromethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
cis-1,2-Dichloroethene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
cis-1,3-Dichloropropene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Dibromochloromethane	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Ethylbenzene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Methylene chloride	13 U	13 U	11 U	13 U	NA	NA	NA
Styrene	1.7 J	6.6 U	5.4 U	6.7 U	NA	NA	NA
Tetrachloroethene	6.4 UJ	6.6 UJ	5.4 UJ	6.7 U	NA	NA	NA
Toluene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
trans-1,2-Dichloroethene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
trans-1,3-Dichloropropene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Trichloroethene	6.4 U	6.6 U	5.4 U	6.7 U	NA	NA	NA
Vinyl chloride	6.4 U	6.6 U	5.4 U	6.7 UJ	NA	NA	NA
Xylene, total	19 U	20 U	16 U	20 U	NA	NA	NA

Appendix A
Surface Soil Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-SO132	VWW06-SO136	VWW06-SO137	VWW06-SO142	VWW06-SS012	VWW06-SS013	
Sample ID	116701-06-Z-132	116701-06-Z-136	116701-06-Z-137	116701-06-Z-142	VWW06-SS012-0211	VWW06-SS013-0211	VWW06-SS013P-0211
Sample Date	06/24/09	06/24/09	06/24/09	06/24/09	02/07/11	02/07/11	02/07/11
Chemical Name							
Semivolatile Organic Compounds (UG/KG)							
1-Methylnaphthalene	310 U	300 U	380 U	360 U	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	190 U	190 U	240 U	220 U	NA	NA	NA
2,4,5-Trichlorophenol	190 U	190 U	240 U	220 U	NA	NA	NA
2,4,6-Trichlorophenol	190 U	190 U	240 U	220 U	NA	NA	NA
2,4-Dichlorophenol	190 U	190 U	240 U	220 U	NA	NA	NA
2,4-Dimethylphenol	190 U	190 U	240 U	220 U	NA	NA	NA
2,4-Dinitrophenol	970 U	930 U	1,200 U	1,100 U	NA	NA	NA
2-Chloronaphthalene	190 U	190 U	240 U	220 U	NA	NA	NA
2-Chlorophenol	190 U	190 U	240 U	220 U	NA	NA	NA
2-Methylnaphthalene	190 U	190 U	240 U	220 U	NA	NA	NA
2-Methylphenol	190 U	190 U	240 U	220 U	NA	NA	NA
2-Nitroaniline	390 U	370 U	480 U	450 U	NA	NA	NA
2-Nitrophenol	190 U	190 U	240 U	220 U	NA	NA	NA
3- and 4-Methylphenol	190 U	190 U	240 U	220 U	NA	NA	NA
3,3'-Dichlorobenzidine	390 U	370 U	480 U	450 U	NA	NA	NA
3-Nitroaniline	390 U	370 U	480 U	450 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	390 U	370 U	480 U	450 U	NA	NA	NA
4-Bromophenyl-phenylether	190 U	190 U	240 U	220 U	NA	NA	NA
4-Chloro-3-methylphenol	190 U	190 U	240 U	220 U	NA	NA	NA
4-Chloroaniline	190 U	190 U	240 U	220 U	NA	NA	NA
4-Chlorophenyl-phenylether	190 U	190 U	240 U	220 U	NA	NA	NA
4-Nitroaniline	390 U	370 U	480 U	450 U	NA	NA	NA
4-Nitrophenol	970 U	930 U	1,200 U	1,100 U	NA	NA	NA
Acenaphthene	190 U	190 U	240 U	220 U	NA	NA	NA
Acenaphthylene	190 U	190 U	240 U	220 U	NA	NA	NA
Anthracene	190 U	190 U	240 U	220 U	NA	NA	NA
Benzo(a)anthracene	82 J	66.4	38 U	36 U	NA	NA	NA
Benzo(a)pyrene	122	84.7	38 U	36 U	NA	NA	NA
Benzo(b)fluoranthene	213	119 J	27.4 J	30.8 J	NA	NA	NA
Benzo(g,h,i)perylene	87	43.2	38 U	36 U	NA	NA	NA
Benzo(k)fluoranthene	71.6	45.3	38 U	36 U	NA	NA	NA
Benzoic acid	970 U	930 U	1,200 UJ	1,100 U	NA	NA	NA
Benzyl alcohol	190 U	190 U	240 U	220 U	NA	NA	NA
bis(2-Chloroethoxy)methane	190 U	190 U	240 U	220 U	NA	NA	NA
bis(2-Chloroethyl)ether	190 U	190 U	240 U	220 U	NA	NA	NA
bis(2-Ethylhexyl)phthalate	390 U	370 U	480 U	450 U	NA	NA	NA
Butylbenzylphthalate	390 U	370 U	480 U	450 U	NA	NA	NA
Carbazole	190 U	190 U	240 U	220 U	NA	NA	NA
Chrysene	91.9	65.1 J	38 U	36 U	NA	NA	NA
Dibenz(a,h)anthracene	31 U	30 U	38 U	36 U	NA	NA	NA
Dibenzofuran	190 U	190 U	240 U	220 U	NA	NA	NA

Appendix A
Surface Soil Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-SO132	VWW06-SO136	VWW06-SO137	VWW06-SO142	VWW06-SS012	VWW06-SS013	
Sample ID	116701-06-Z-132	116701-06-Z-136	116701-06-Z-137	116701-06-Z-142	VWW06-SS012-0211	VWW06-SS013-0211	VWW06-SS013P-0211
Sample Date	06/24/09	06/24/09	06/24/09	06/24/09	02/07/11	02/07/11	02/07/11
Chemical Name							
Diethylphthalate	390 U	370 U	480 U	450 U	NA	NA	NA
Dimethyl phthalate	390 U	370 U	480 U	450 U	NA	NA	NA
Di-n-butylphthalate	390 U	370 U	480 U	450 U	NA	NA	NA
Di-n-octylphthalate	390 U	370 U	480 U	450 U	NA	NA	NA
Fluoranthene	101 J	48.5 J	240 U	220 U	NA	NA	NA
Fluorene	190 U	190 U	240 U	220 U	NA	NA	NA
Hexachlorobenzene	190 U	190 U	240 U	220 U	NA	NA	NA
Hexachlorobutadiene	190 U	190 U	240 U	220 U	NA	NA	NA
Hexachlorocyclopentadiene	190 U	190 U	240 UJ	220 U	NA	NA	NA
Hexachloroethane	190 U	190 U	240 U	220 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	126	60.8	38 U	36 U	NA	NA	NA
Isophorone	190 U	190 U	240 U	220 U	NA	NA	NA
Naphthalene	190 U	190 U	240 U	220 U	NA	NA	NA
n-Nitroso-di-n-propylamine	190 U	190 U	240 U	220 U	NA	NA	NA
n-Nitrosodiphenylamine	190 U	190 U	240 U	220 U	NA	NA	NA
Pentachlorophenol	970 U	930 U	1,200 U	1,100 U	NA	NA	NA
Phenanthrene	190 U	190 U	240 U	220 U	NA	NA	NA
Phenol	190 U	190 U	240 U	220 U	NA	NA	NA
Pyrene	99.5 J	40.3 J	240 U	220 U	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)							
4,4'-DDD	35.6 J	3.7 U	4.7 U	44 U	NA	NA	NA
4,4'-DDE	86	3.7 U	2.3 J	8.9	NA	NA	NA
4,4'-DDT	352	3.7 U	4.7 UJ	44 U	NA	NA	NA
Aldrin	39 U	1.8 U	2.4 U	2.2 U	NA	NA	NA
alpha-BHC	39 U	1.8 U	2.4 U	2.2 U	NA	NA	NA
alpha-Chlordane	39 U	1.8 U	2.4 UJ	2.2 U	NA	NA	NA
Aroclor-1016	19 U	18 U	24 U	22 U	19 U	22 U	22 U
Aroclor-1221	19 U	18 U	24 U	22 U	17 U	20 U	21 U
Aroclor-1232	19 U	18 U	24 U	22 U	22 U	25 U	26 U
Aroclor-1242	19 U	18 U	24 U	22 U	16 U	18 U	19 U
Aroclor-1248	19 U	18 U	24 U	22 U	16 U	18 U	19 U
Aroclor-1254	19 U	18 U	24 U	61.3	98	16 U	16 U
Aroclor-1260	19 U	18 U	24 U	22 U	8.8 U	10 U	10 U
beta-BHC	39 U	1.8 U	2.4 U	2.2 U	NA	NA	NA
delta-BHC	39 U	1.8 U	2.4 U	2.2 U	NA	NA	NA
Dieldrin	39 U	1.8 U	2.4 UJ	2.2 U	NA	NA	NA
Endosulfan I	39 U	1.8 U	2.4 U	2.2 U	NA	NA	NA
Endosulfan II	39 U	1.8 U	2.4 U	2.2 U	NA	NA	NA
Endosulfan sulfate	78 U	3.7 U	4.7 U	4.4 U	NA	NA	NA
Endrin	78 U	3.7 U	4.7 U	4.4 U	NA	NA	NA
Endrin aldehyde	78 U	3.7 U	4.7 U	4.4 U	NA	NA	NA

Appendix A
Surface Soil Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-SO132	VWW06-SO136	VWW06-SO137	VWW06-SO142	VWW06-SS012	VWW06-SS013	
Sample ID	116701-06-Z-132	116701-06-Z-136	116701-06-Z-137	116701-06-Z-142	VWW06-SS012-0211	VWW06-SS013-0211	VWW06-SS013P-0211
Sample Date	06/24/09	06/24/09	06/24/09	06/24/09	02/07/11	02/07/11	02/07/11
Chemical Name							
Endrin ketone	78 U	3.7 U	4.7 UJ	4.4 U	NA	NA	NA
gamma-BHC (Lindane)	39 U	1.8 U	2.4 U	2.2 U	NA	NA	NA
gamma-Chlordane	39 U	1.8 U	2.4 UJ	2.2 U	NA	NA	NA
Heptachlor	39 U	1.8 U	2.4 U	2.2 U	NA	NA	NA
Heptachlor epoxide	39 U	1.8 U	2.4 UJ	2.2 U	NA	NA	NA
Methoxychlor	78 U	3.7 U	4.7 UJ	4.4 UJ	NA	NA	NA
Polychlorinated biphenyls (PCBs)	39 U	37 U	47 U	61.3	NA	NA	NA
Toxaphene	1,900 U	92 U	120 U	110 U	NA	NA	NA
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	140 U	160 U	160 U	160 U	NA	NA	NA
1,3-Dinitrobenzene	140 U	160 U	160 U	160 U	NA	NA	NA
2,4-Dinitrotoluene	140 U	160 U	160 U	160 U	NA	NA	NA
2,6-Dinitrotoluene	140 U	160 U	160 U	160 U	NA	NA	NA
2,4,6-Trinitrotoluene	140 U	160 U	160 U	160 U	NA	NA	NA
2-Amino-4,6-dinitrotoluene	140 U	160 U	160 U	160 U	NA	NA	NA
2-Nitrotoluene	140 U	160 U	160 U	160 U	NA	NA	NA
3-Nitrotoluene	140 U	160 U	160 U	160 U	NA	NA	NA
4-Amino-2,6-dinitrotoluene	140 U	160 U	160 U	160 U	NA	NA	NA
4-Nitrotoluene	140 U	160 U	160 U	160 U	NA	NA	NA
HMX	140 U	160 U	160 U	160 U	NA	NA	NA
Nitrobenzene	140 U	160 U	160 U	160 U	NA	NA	NA
RDX	140 U	160 U	160 U	160 U	NA	NA	NA
Tetryl	140 U	160 U	160 U	160 U	NA	NA	NA
Total Metals (MG/KG)							
Aluminum	8,030	16,200	4,010	16,000	NA	NA	NA
Antimony	2.1 J	1.3 J	17 U	1.2 J	NA	NA	NA
Arsenic	1.8	0.48 J	1.7 J	0.69	NA	NA	NA
Barium	31.8	48.9	17.6	58.7	NA	NA	NA
Beryllium	0.13 J	0.3	0.35 U	0.32 J	NA	NA	NA
Cadmium	0.79	0.42 U	0.12 J	0.31	NA	NA	NA
Calcium	84,500	4,180	124,000	12,500	NA	NA	NA
Chromium	16.3	24.6	6.7	23.7	NA	NA	NA
Cobalt	6.7	16.5	2.2 J	16.2	NA	NA	NA
Copper	69.9	51.6	25.1	65.7	NA	NA	NA
Cyanide	0.13 U	0.13 U	0.15 U	0.14 U	NA	NA	NA
Iron	17,100	32,200	6,860	26,700	NA	NA	NA
Lead	145	4 J	62.1	47.7	NA	NA	NA
Magnesium	5,990	11,500	3,080	9,850	NA	NA	NA
Manganese	426	911	75.6	961	NA	NA	NA
Mercury	0.035 J	0.093 U	0.02 J	0.027 J	NA	NA	NA
Nickel	10.7	16.6	4.7	18.1	NA	NA	NA
Potassium	1,550	640	1,500	2,800	NA	NA	NA
Selenium	2.4 J	11 U	4.4 J	6.5 U	NA	NA	NA

Appendix A

Surface Soil Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Station ID	VWW06-SO132	VWW06-SO136	VWW06-SO137	VWW06-SO142	VWW06-SS012	VWW06-SS013	
Sample ID	116701-06-Z-132	116701-06-Z-136	116701-06-Z-137	116701-06-Z-142	VWW06-SS012-0211	VWW06-SS013-0211	VWW06-SS013P-0211
Sample Date	06/24/09	06/24/09	06/24/09	06/24/09	02/07/11	02/07/11	02/07/11
Chemical Name							
Silver	0.27 J	0.53 U	0.69 U	0.084 J	NA	NA	NA
Sodium	8,430	3,110	9,180	7,070	NA	NA	NA
Thallium	11 U	22 U	3.5 U	13 U	NA	NA	NA
Vanadium	29	108	13.8	82.3	NA	NA	NA
Zinc	126 J	51.5 J	56.7 J	127 J	NA	NA	NA
Total Petroleum Hydrocarbons (UG/KG)							
TPH-diesel range	5,830 J	37,200	12,000 U	11,000 U	NA	NA	NA
TPH-gas range	6,700 U	6,200 U	11,000 U	8,700 U	NA	NA	NA

P:\USNAVFACENGCOM\433193CTO0013\SWMU_6_FS_Draft\Appendix _A_Post_Removal Surface Soil_Sediment_and Surface Water Raw Data\[1-SWMU6_Surface Soil Analytical Summary Table.xlsx], Victoria Brynildsen, 06/08/2011

Notes:

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Site							
Station ID	VWW06-SW001	VWW06-SW002	VWW06-SW003	VWW06-SW004	VWW06-SW005	VWW06-SW006	VWW06-SW007	
Sample ID	VWW06-SW001-0211	VWW06-SW002-0211	VWW06-SW003-0211	VWW06-SW004-0211	VWW06-SW005-0211	VWW06-SW006-0211	VWW06-SW007-0211	VWW06-SW007P-0211
Sample Date	02/07/11	02/07/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
1,1,2,2-Tetrachloroethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
1,1,2-Trichloroethane	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
1,2,3-Trichlorobenzene	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2,4-Trichlorobenzene	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dibromo-3-chloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromoethane	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,2-Dichloropropane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,3-Dichlorobenzene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,4-Dichlorobenzene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Butanone	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
2-Hexanone	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
4-Methyl-2-pentanone	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Acetone	2.6 U	2.6 U	2.6 U	2.8 U	2.6 U	3.6 U	2.6 U	2.6 U
Benzene	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Bromochloromethane	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Bromodichloromethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromoform	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Bromomethane	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U
Carbon disulfide	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Carbon tetrachloride	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Chlorobenzene	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloromethane	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
cis-1,2-Dichloroethene	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
cis-1,3-Dichloropropene	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Cyclohexane	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Dibromochloromethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Dichlorodifluoromethane (Freon-12)	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Ethylbenzene	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Isopropylbenzene	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Methyl acetate	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Methylcyclohexane	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Methylene chloride	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Methyl-tert-butyl ether (MTBE)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Tetrachloroethene	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
Toluene	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Trichloroethene	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Site							
Station ID	VWW06-SW001	VWW06-SW002	VWW06-SW003	VWW06-SW004	VWW06-SW005	VWW06-SW006	VWW06-SW007	
Sample ID	VWW06-SW001-0211	VWW06-SW002-0211	VWW06-SW003-0211	VWW06-SW004-0211	VWW06-SW005-0211	VWW06-SW006-0211	VWW06-SW007-0211	VWW06-SW007P-0211
Sample Date	02/07/11	02/07/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11
Chemical Name								
Trichlorofluoromethane (Freon-11)	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Vinyl chloride	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Xylene, total	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Semivolatile Organic Compounds (UG/L)								
1-Methylnaphthalene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
2-Methylnaphthalene	0.042 U	0.023 J	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Acenaphthene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Acenaphthylene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Anthracene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(a)anthracene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(a)pyrene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(b)fluoranthene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(g,h,i)perylene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(k)fluoranthene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Chrysene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Dibenz(a,h)anthracene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Fluoranthene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Fluorene	0.042 U	0.042 U	0.041 U	0.041 U	0.043 J	0.047 J	0.055 J	0.041 UJ
Indeno(1,2,3-cd)pyrene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Naphthalene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Phenanthrene	0.042 U	0.023 J	0.051 U	0.059 U	0.064	0.069	0.079 J	0.047 UJ
Pyrene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Pesticide/Polychlorinated Biphenyls (UG/L)								
4,4'-DDD	0.0054 U	0.0053 U	0.0054 U	0.0054 U	0.0053 U	0.0054 U	0.0054 U	0.0054 U
4,4'-DDE	0.0079 U	0.0078 U	0.0079 U	0.0078 U	0.0078 U	0.0079 U	0.0078 U	0.0079 U
4,4'-DDT	0.0023 U	0.0022 U	0.0023 U	0.0023 U	0.0022 U	0.0023 U	0.0023 U	0.0023 U
Aldrin	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
alpha-BHC	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
alpha-Chlordane	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Aroclor-1016	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1221	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1232	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
Aroclor-1242	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1248	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Aroclor-1254	0.0099 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.01 U	0.0099 U	0.0099 U
Aroclor-1260	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U
beta-BHC	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
delta-BHC	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Dieldrin	0.0056 U	0.0055 U	0.0056 U	0.0056 U	0.0055 U	0.0056 U	0.0056 U	0.0056 U
Endosulfan I	0.0089 U	0.0088 U	0.0089 U	0.0089 U	0.0088 U	0.0089 U	0.0089 U	0.009 U
Endosulfan II	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
Endosulfan sulfate	0.0021 U	0.002 U	0.0021 U	0.0021 U	0.002 U	0.0021 U	0.0021 U	0.0021 U
Endrin	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0038 U
Endrin aldehyde	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U
Endrin ketone	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
gamma-BHC (Lindane)	0.005 U	0.0049 U	0.005 U	0.0049 U	0.0049 U	0.005 U	0.0049 U	0.005 U
gamma-Chlordane	0.005 U	0.0049 U	0.005 U	0.0049 U	0.0049 U	0.005 U	0.0049 U	0.005 U
Heptachlor	0.0082 U	0.0081 U	0.0082 U	0.0082 U	0.0081 U	0.0082 U	0.0082 U	0.0082 U

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Site							
Station ID	VWW06-SW001	VWW06-SW002	VWW06-SW003	VWW06-SW004	VWW06-SW005	VWW06-SW006	VWW06-SW007	
Sample ID	VWW06-SW001-0211	VWW06-SW002-0211	VWW06-SW003-0211	VWW06-SW004-0211	VWW06-SW005-0211	VWW06-SW006-0211	VWW06-SW007-0211	VWW06-SW007P-0211
Sample Date	02/07/11	02/07/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11
Chemical Name								
Heptachlor epoxide	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U
Methoxychlor	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0038 U
Toxaphene	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U
Total Metals (UG/L)								
Aluminum	316 J	446 J	1,630 R	875 R	698 R	559 R	372 R	372 R
Antimony	20 U	66 U	10.3 J	100 U	20 U	100 U	100 U	100 U
Arsenic	66.2 U	66.2 U	25 U	132 U	132 U	132 U	132 U	132 U
Barium	8.09 J	9.36 J	7.06 J	16.1 J	13.7 J	7.67 J	5.74 J	5.42 J
Beryllium	2.4 U	2.4 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
Cadmium	9.86 J	11 J	10 U	15.9 J	20 U	28.8 U	28.8 U	28.8 U
Calcium	393,000	392,000	419,000 J	523,000 J	489,000 J	498,000 J	462,000 J	464,000 J
Chromium	8.6 U	8.6 U	17.2 U	17.2 U	17.2 U	17.2 U	17.2 U	17.2 U
Chromium (hexavalent)	7 U	7 UJ	35 J	21 J	41 J	12 J	12 J	22 J
Cobalt	7.4 U	7.4 U	10 U	14.8 U	14.8 U	14.8 U	14.8 U	14.8 U
Copper	104 J	98.9 J	25 U	108 U	108 U	108 U	108 U	108 U
Iron	110 U	118 J	392 J	813 J	590 J	220 U	220 U	220 U
Lead	20 U	39.4 J	10 U	20 U	20 U	20 U	20 U	20 U
Magnesium	1,200,000	1,220,000	1,310,000 J	1,360,000 J	1,180,000 J	1,360,000 J	1,260,000 J	1,160,000 J
Manganese	7 U	7 U	14 U	14 U	14 U	14 U	14 U	14 U
Mercury	0.0401 J	0.074 UJ	0.0411 J	0.074 UJ	0.074 UJ	0.074 UJ	0.074 UJ	0.074 UJ
Nickel	18.6 U	18.6 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U
Potassium	417,000	415,000	433,000	544,000	510,000	512,000	476,000	480,000
Selenium	70.1 J	74.2 J	164 UJ	164 UJ	164 UJ	164 UJ	164 UJ	164 UJ
Silver	10.4 U	10.4 U	2.5 U	20.8 U	5 U	20.8 U	20.8 U	20.8 U
Sodium	10,500,000	10,500,000	11,100,000	15,900,000	11,500,000	11,300,000	10,600,000	10,800,000
Thallium	88 U	88 U	121 J	176 U	176 U	176 U	176 U	176 U
Vanadium	5.3 J	8.8 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U
Zinc	80 U	80 U	160 U	160 U	160 U	160 U	160 U	160 U
Dissolved Metals (UG/L)								
Aluminum, Dissolved	186 U	186 U	1,220 J	1,740 J	387 J	1,450 J	1,230 R	372 R
Antimony, Dissolved	66 U	66 U	10 U	100 U	20 U	100 U	100 U	100 U
Arsenic, Dissolved	66.2 U	66.2 U	132 U	132 U	132 U	132 U	132 U	132 U
Barium, Dissolved	6.83 J	7.36 J	7.58 J	19.6 J	15.5 J	8.79 J	6.48 J	5.92 J
Beryllium, Dissolved	2.4 U	2.4 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
Cadmium, Dissolved	14.4 U	14.4 U	10 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U
Calcium, Dissolved	400,000	400,000	418,000	419,000	484,000	416,000	409,000	465,000
Chromium, Dissolved	8.6 U	8.6 U	17.2 U	17.2 U	17.2 U	17.2 U	17.2 U	17.2 U
Chromium (hexavalent), Dissolved	7 UJ	7 UJ	12 J	13 J	14 J	13 J	9 J	8 J
Cobalt, Dissolved	7.4 U	7.4 U	14.8 U	14.8 U	14.8 U	14.8 U	14.8 U	14.8 U
Copper, Dissolved	54 U	54 U	108 U	108 U	108 U	108 U	108 U	108 U
Iron, Dissolved	318 J	110 U	220 U	293 J	220 U	220 U	220 U	220 U
Lead, Dissolved	20 U	20 U	10 U	20 U	20 U	20 U	20 U	20 U
Magnesium, Dissolved	1,270,000 J	1,260,000 J	1,320,000	1,280,000	1,080,000	1,290,000	1,290,000	1,200,000
Manganese, Dissolved	7 U	7 U	14 U	14 U	14 U	14 U	14 U	14 U
Mercury, Dissolved	0.0434 J	0.0475 J	0.074 UJ	0.0439 J	0.0474 J	0.074 UJ	0.074 UJ	0.074 UJ
Nickel, Dissolved	18.6 U	18.6 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U
Potassium, Dissolved	408,000	409,000	438,000	436,000	498,000	435,000	428,000	470,000
Selenium, Dissolved	82 U	50.5 J	164 U	164 U	164 U	164 U	164 U	164 U
Silver, Dissolved	10.4 U	10.4 U	2.5 U	20.8 U	20.8 U	20.8 U	20.8 U	20.8 U
Sodium, Dissolved	10,400,000	10,300,000	11,000,000 J	10,800,000 J	11,000,000 J	10,700,000 J	10,900,000 J	10,700,000 J
Thallium, Dissolved	88 U	88 U	176 U	176 U	176 U	176 U	176 U	176 U

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Site							
Station ID	VWW06-SW001	VWW06-SW002	VWW06-SW003	VWW06-SW004	VWW06-SW005	VWW06-SW006	VWW06-SW007	
Sample ID	VWW06-SW001-0211	VWW06-SW002-0211	VWW06-SW003-0211	VWW06-SW004-0211	VWW06-SW005-0211	VWW06-SW006-0211	VWW06-SW007-0211	VWW06-SW007P-0211
Sample Date	02/07/11	02/07/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11
Chemical Name								
Vanadium, Dissolved	4.67 J	8.8 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U
Zinc, Dissolved	80 U	80 U	160 U	160 U	160 U	160 U	160 U	160 U

Notes:

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

R - Unreliable Result

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/L - Milligrams per liter

UG/L - Micrograms per liter

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Background							
Station ID	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021
Sample ID	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211
Sample Date	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Background							
Station ID	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021
Sample ID	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211
Sample Date	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name								
Trichlorofluoromethane (Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, total	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/L)								
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)								
4,4'-DDD	0.0054 U	0.0055 U	0.0055 U	0.0054 U	0.048 J	0.0054 U	0.0054 U	0.0054 U
4,4'-DDE	0.0079 U	0.008 U	0.0081 U	0.0079 U	0.067	0.0079 U	0.0078 U	0.0079 U
4,4'-DDT	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.083	0.0023 U	0.0023 U	0.0023 U
Aldrin	0.0033 U	0.0034 U	0.0034 U	0.0033 U	0.0046 NJ	0.0033 U	0.0033 U	0.0033 U
alpha-BHC	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
alpha-Chlordane	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.045 J	0.0062 U	0.0062 U	0.0062 U
Aroclor-1016	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U
Aroclor-1221	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U
Aroclor-1232	NA	NA	NA	NA	0.016 U	0.016 U	0.016 U	0.016 U
Aroclor-1242	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U
Aroclor-1248	NA	NA	NA	NA	0.011 U	0.011 U	0.011 U	0.011 U
Aroclor-1254	NA	NA	NA	NA	0.0098 U	0.0099 U	0.0099 U	0.0098 U
Aroclor-1260	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U
beta-BHC	0.0025 U	0.0025 U	0.0026 U	0.0025 U	0.025 J	0.0025 U	0.0025 U	0.0025 U
delta-BHC	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.012 J	0.0062 U	0.0062 U	0.0062 U
Dieldrin	0.0056 U	0.0057 U	0.0057 U	0.0056 U	0.047 J	0.0056 U	0.0056 U	0.0056 U
Endosulfan I	0.009 U	0.009 U	0.0091 U	0.0089 U	0.049 J	0.0089 U	0.0089 U	0.009 U
Endosulfan II	0.0033 U	0.0034 U	0.0034 U	0.0033 U	0.04 J	0.0033 U	0.0033 U	0.0033 U
Endosulfan sulfate	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.026 J	0.0021 U	0.0021 U	0.0021 U
Endrin	0.0038 U	0.0038 U	0.0038 U	0.0037 U	0.053	0.0037 U	0.0037 U	0.0038 U
Endrin aldehyde	0.0031 U	0.0032 U	0.0032 U	0.0031 U	0.0053 J	0.0031 U	0.0031 U	0.0031 U
Endrin ketone	0.012 U	0.013 U	0.013 U	0.012 U	0.029 J	0.012 U	0.012 U	0.012 U
gamma-BHC (Lindane)	0.005 U	0.005 U	0.0051 U	0.005 U	0.005 U	0.005 U	0.0049 U	0.005 U
gamma-Chlordane	0.005 U	0.005 U	0.0051 U	0.005 U	0.026 J	0.005 U	0.0049 U	0.005 U
Heptachlor	0.0082 U	0.0083 U	0.0084 U	0.0082 U	0.0074 J	0.0082 U	0.0082 U	0.0082 U

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Background							
Station ID	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021
Sample ID	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211
Sample Date	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name								
Heptachlor epoxide	0.0029 U	0.0029 U	0.003 U	0.0029 U	0.038 J	0.0029 U	0.0029 U	0.0029 U
Methoxychlor	0.0038 U	0.0038 U	0.0038 U	0.0037 U	0.061	0.0037 U	0.0037 U	0.0038 U
Toxaphene	0.38 U	0.38 U	0.38 U	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U
Total Metals (UG/L)								
Aluminum	186 U	186 U	428 J	282 J	1,240 R	2,030 R	800 R	490 R
Antimony	66 U	20 U	20 U	20 U	36.8 J	20 U	20 U	20 U
Arsenic	50 U	66.2 U	66.2 U	66.2 U	50 U	50 U	50 U	66.2 U
Barium	33.4 J	29.6 J	33.9 J	31.7 J	9.84 J	13 J	10.6 J	8.47 J
Beryllium	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Cadmium	20 U	14.4 U	9.35 J	11.4 J	14.4 U	8.76 J	9.14 J	9.35 J
Calcium	519,000	503,000	539,000	512,000	421,000	424,000	410,000	427,000
Chromium	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U
Chromium (hexavalent)	53	44 J	43 J	97 J	21	18 J	29 J	8 J
Cobalt	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U
Copper	50 U	98.6 J	149 J	108 J	46.2 J	45 J	40.7 J	40.7 J
Iron	110 U	110 U	201 J	110 U	635 J	1,660 J	331 J	110 UJ
Lead	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium	1,570,000	1,550,000	1,620,000	1,520,000	1,310,000	1,320,000	1,290,000	1,310,000
Manganese	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U
Mercury	0.0514 J	0.0516 J	0.074 UJ	0.074 UJ	0.074 U	0.074 U	0.0426 J	0.074 U
Nickel	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U
Potassium	533,000	514,000	533,000	521,000	433,000	437,000	421,000	435,000
Selenium	113	102	99.6	50.7 J	84.2 J	89.6 J	54.9 J	103
Silver	5 U	5 U	10.4 U	5 U	5 U	5 U	5 U	5 U
Sodium	13,600,000	13,600,000	13,800,000	13,200,000	11,000,000	11,200,000	11,100,000	11,000,000
Thallium	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U
Vanadium	8.8 U	8.8 U	8.8 U	8.8 U	5.9 J	7.77 J	4.98 J	8.8 U
Zinc	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U
Dissolved Metals (UG/L)								
Aluminum, Dissolved	186 U	186 U	252 J	200 J	186 U	186 U	186 U	186 U
Antimony, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic, Dissolved	50 U	66.2 U	66.2 U	66.2 U	50 U	50 U	50 U	66.2 U
Barium, Dissolved	26.4 J	26.6 J	28 J	28.4 J	8.65 J	10.2 J	9.74 J	7.76 J
Beryllium, Dissolved	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Cadmium, Dissolved	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U
Calcium, Dissolved	535,000	556,000	553,000	548,000	414,000 R	434,000 R	430,000 R	434,000 R
Chromium, Dissolved	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U
Chromium (hexavalent), Dissolved	16 J	19 J	38 J	20 J	15 J	7 J	16 J	7 UJ
Cobalt, Dissolved	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U
Copper, Dissolved	50 U	54 U	54 U	54 U	50 U	50 U	50 U	54 U
Iron, Dissolved	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U
Lead, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium, Dissolved	1,640,000 J	1,680,000 J	1,690,000 J	1,690,000 J	1,310,000 R	1,340,000 R	1,360,000 R	1,350,000 R
Manganese, Dissolved	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U
Mercury, Dissolved	0.0621 J	0.0551 J	0.0469 J	0.053 J	0.074 U	0.074 U	0.074 U	0.074 U
Nickel, Dissolved	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U
Potassium, Dissolved	533,000	550,000	552,000	539,000	428,000 R	447,000 R	443,000 R	448,000 R
Selenium, Dissolved	100 J	114 J	82 U	82 U	68.8 J	105	72.8 J	104
Silver, Dissolved	5 U	5 U	10.4 U	5 U	5 U	5 U	5 U	5 U
Sodium, Dissolved	13,900,000	14,500,000	15,600,000	13,700,000	10,900,000	10,900,000	11,300,000	11,100,000
Thallium, Dissolved	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Background							
Station ID	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021
Sample ID	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211
Sample Date	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name								
Vanadium, Dissolved	8.8 U	8.8 U	8.8 U	5.37 J	8.8 U	8.8 U	4.94 J	4.5 J
Zinc, Dissolved	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U

Notes:

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

R - Unreliable Result

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/L - Milligrams per liter

UG/L - Micrograms per liter

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Background (continued)		
Station ID	VWW06-SW022	VWW06-SW023	
Sample ID	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Sample Date	02/08/11	02/08/11	02/08/11
Chemical Name			
Volatile Organic Compounds (UG/L)			
1,1,1-Trichloroethane	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA
1,2,3-Trichlorobenzene	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA
2-Butanone	NA	NA	NA
2-Hexanone	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA
Acetone	NA	NA	NA
Benzene	NA	NA	NA
Bromochloromethane	NA	NA	NA
Bromodichloromethane	NA	NA	NA
Bromoform	NA	NA	NA
Bromomethane	NA	NA	NA
Carbon disulfide	NA	NA	NA
Carbon tetrachloride	NA	NA	NA
Chlorobenzene	NA	NA	NA
Chloroethane	NA	NA	NA
Chloroform	NA	NA	NA
Chloromethane	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA
Cyclohexane	NA	NA	NA
Dibromochloromethane	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	NA	NA	NA
Ethylbenzene	NA	NA	NA
Isopropylbenzene	NA	NA	NA
Methyl acetate	NA	NA	NA
Methylcyclohexane	NA	NA	NA
Methylene chloride	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA
Styrene	NA	NA	NA
Tetrachloroethene	NA	NA	NA
Toluene	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA
Trichloroethene	NA	NA	NA

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Background (continued)		
Station ID	VWW06-SW022	VWW06-SW023	
Sample ID	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Sample Date	02/08/11	02/08/11	02/08/11
Chemical Name			
Trichlorofluoromethane (Freon-11)	NA	NA	NA
Vinyl chloride	NA	NA	NA
Xylene, total	NA	NA	NA
Semivolatile Organic Compounds (UG/L)			
1-Methylnaphthalene	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA
Acenaphthene	NA	NA	NA
Acenaphthylene	NA	NA	NA
Anthracene	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA
Chrysene	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA
Fluoranthene	NA	NA	NA
Fluorene	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA
Naphthalene	NA	NA	NA
Phenanthrene	NA	NA	NA
Pyrene	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)			
4,4'-DDD	0.0054 U	0.0054 U	0.0054 U
4,4'-DDE	0.0078 U	0.0079 U	0.0079 U
4,4'-DDT	0.0023 U	0.0023 U	0.0023 U
Aldrin	0.0033 U	0.0033 U	0.0033 U
alpha-BHC	0.0062 U	0.0062 U	0.0062 U
alpha-Chlordane	0.0062 U	0.0062 U	0.0062 U
Aroclor-1016	0.021 U	0.021 U	0.021 U
Aroclor-1221	0.021 U	0.021 U	0.021 U
Aroclor-1232	0.016 U	0.016 U	0.017 U
Aroclor-1242	0.021 U	0.021 U	0.021 U
Aroclor-1248	0.011 U	0.011 U	0.011 U
Aroclor-1254	0.0099 U	0.01 U	0.01 U
Aroclor-1260	0.021 U	0.021 U	0.021 U
beta-BHC	0.0025 U	0.0025 U	0.0025 U
delta-BHC	0.0062 U	0.0062 U	0.0062 U
Dieldrin	0.0056 U	0.0056 U	0.0056 U
Endosulfan I	0.0089 U	0.009 U	0.009 U
Endosulfan II	0.0033 U	0.0033 U	0.0033 U
Endosulfan sulfate	0.0021 U	0.0021 U	0.0021 U
Endrin	0.0037 U	0.0038 U	0.0038 U
Endrin aldehyde	0.0031 U	0.0031 U	0.0031 U
Endrin ketone	0.012 U	0.012 U	0.012 U
gamma-BHC (Lindane)	0.0049 U	0.005 U	0.005 U
gamma-Chlordane	0.0049 U	0.005 U	0.005 U
Heptachlor	0.0082 U	0.0082 U	0.0082 U

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Background (continued)		
Station ID	VWW06-SW022	VWW06-SW023	
Sample ID	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Sample Date	02/08/11	02/08/11	02/08/11
Chemical Name			
Heptachlor epoxide	0.0029 U	0.0029 U	0.0029 U
Methoxychlor	0.0037 U	0.0038 U	0.0038 U
Toxaphene	0.37 U	0.38 U	0.38 U
Total Metals (UG/L)			
Aluminum	602 R	640 R	586 R
Antimony	20 U	72.7 J	20 U
Arsenic	66.2 U	50 U	50 U
Barium	10.5 J	10.3 J	9.64 J
Beryllium	2.4 U	2.4 U	2.4 U
Cadmium	11 J	9.5 J	9.58 J
Calcium	427,000	425,000	425,000
Chromium	8.6 U	8.6 U	8.6 U
Chromium (hexavalent)	12 J	29 J	47 J
Cobalt	7.4 U	7.4 U	7.4 U
Copper	44 J	42 J	37.3 J
Iron	176 J	314 J	227 J
Lead	20 U	20 U	20 U
Magnesium	1,300,000	1,300,000	1,320,000
Manganese	7 U	7 U	7 U
Mercury	0.074 U	0.074 UJ	0.0405 J
Nickel	18.6 U	18.6 U	18.6 U
Potassium	436,000	429,000	430,000
Selenium	49.3 J	82 U	82 U
Silver	5 U	5 U	5 U
Sodium	11,000,000	10,800,000	10,800,000
Thallium	88 U	88 U	88 U
Vanadium	8.8 U	8.8 U	5.46 J
Zinc	80 U	80 U	80 U
Dissolved Metals (UG/L)			
Aluminum, Dissolved	186 U	186 U	186 U
Antimony, Dissolved	20 U	20 U	20 U
Arsenic, Dissolved	66.2 U	66.2 U	50 U
Barium, Dissolved	9.8 J	10.6 J	7.41 J
Beryllium, Dissolved	2.4 U	2.4 U	2.4 U
Cadmium, Dissolved	14.4 U	14.4 U	14.4 U
Calcium, Dissolved	422,000 R	438,000 R	415,000 R
Chromium, Dissolved	8.6 U	8.6 U	8.6 U
Chromium (hexavalent), Dissolved	4 J	16 J	16 J
Cobalt, Dissolved	7.4 U	7.4 U	7.4 U
Copper, Dissolved	54 U	54 U	26 J
Iron, Dissolved	110 U	110 U	110 U
Lead, Dissolved	20 U	20 U	11.9 J
Magnesium, Dissolved	1,310,000 R	1,350,000 R	1,270,000 R
Manganese, Dissolved	7 U	7 U	7 U
Mercury, Dissolved	0.0454 J	0.074 UJ	0.074 UJ
Nickel, Dissolved	18.6 U	18.6 U	18.6 U
Potassium, Dissolved	431,000 R	443,000 R	419,000 R
Selenium, Dissolved	96.8	121	65.9 J
Silver, Dissolved	5 U	5 U	5 U
Sodium, Dissolved	10,900,000	11,400,000	10,500,000
Thallium, Dissolved	88 U	88 U	88 U

Appendix A

Surface Water Analytical Summary Table

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

	Background (continued)		
Station ID	VWW06-SW022	VWW06-SW023	
Sample ID	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Sample Date	02/08/11	02/08/11	02/08/11
Chemical Name			
Vanadium, Dissolved	5.82 J	5.78 J	8.8 U
Zinc, Dissolved	80 U	80 U	80 U

Notes:

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

R - Unreliable Result

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/L - Milligrams per liter

UG/L - Micrograms per liter

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Site										
Station ID	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010
Sample ID	VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211
Sample Date	02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11
Chemical Name											
Volatile Organic Compounds (UG/KG)											
1,1,1-Trichloroethane	2.4 UJ	2.4 UJ	1.4 UJ	1 UJ	0.97 U	1.2 UJ	1 U	1.4 UJ	0.67 U	2.2 UJ	0.91 U
1,1,2,2-Tetrachloroethane	4.4 UJ	4.4 UJ	2.5 UJ	1.8 UJ	1.8 U	2.2 UJ	1.9 U	2.6 UJ	1.2 U	4.1 UJ	1.7 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	4.8 UJ	4.8 UJ	2.7 UJ	2 UJ	1.9 U	2.4 UJ	2.1 U	2.8 UJ	1.3 U	4.4 UJ	1.8 U
1,1,2-Trichloroethane	6.2 UJ	6.2 UJ	3.5 UJ	2.6 UJ	2.5 U	3.1 UJ	2.7 U	3.6 UJ	1.7 U	5.7 UJ	2.3 U
1,1-Dichloroethane	2.6 UJ	2.6 UJ	1.4 UJ	1.1 UJ	1 U	1.3 UJ	1.1 U	1.5 UJ	0.71 U	2.4 UJ	0.96 U
1,1-Dichloroethene	2.6 UJ	2.6 UJ	1.4 UJ	1.1 UJ	1 U	1.3 UJ	1.1 U	1.5 UJ	0.71 U	2.4 UJ	0.96 U
1,2,3-Trichlorobenzene	4.6 UJ	4.6 UJ	2.6 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.3 U	4.3 UJ	1.7 U
1,2,4-Trichlorobenzene	4.8 UJ	4.8 UJ	2.7 UJ	2 UJ	1.9 U	2.4 UJ	2.1 U	2.8 UJ	1.3 U	4.4 UJ	1.8 U
1,2-Dibromo-3-chloropropane	18.9 UJ	18.9 UJ	10.6 UJ	7.8 UJ	7.6 U	9.5 UJ	8.2 U	11.1 UJ	5.2 U	17.5 UJ	7.1 U
1,2-Dibromoethane	6.2 UJ	6.2 UJ	3.5 UJ	2.6 UJ	2.5 U	3.1 UJ	2.7 U	3.6 UJ	1.7 U	5.7 UJ	2.3 U
1,2-Dichlorobenzene	4.2 UJ	4.2 UJ	2.4 UJ	1.8 UJ	1.7 U	2.1 UJ	1.8 U	2.5 UJ	1.2 U	3.9 UJ	1.6 U
1,2-Dichloroethane	7.6 UJ	7.5 UJ	4.2 UJ	3.1 UJ	3 U	3.8 UJ	3.3 U	4.4 UJ	2.1 U	7 UJ	2.8 U
1,2-Dichloropropane	4.8 UJ	4.8 UJ	2.7 UJ	2 UJ	1.9 U	2.4 UJ	2.1 U	2.8 UJ	1.3 U	4.4 UJ	1.8 U
1,3-Dichlorobenzene	3.4 UJ	3.4 UJ	1.9 UJ	1.4 UJ	1.4 U	1.7 UJ	1.5 U	2 UJ	0.94 U	3.2 UJ	1.3 U
1,4-Dichlorobenzene	4.9 UJ	4.9 UJ	2.8 UJ	2 UJ	2 U	2.5 UJ	2.1 U	2.9 UJ	1.4 U	4.6 UJ	1.8 U
2-Butanone	30.5 J	28.5 J	23.9 J	4.4 UJ	19.5	13.4 J	7.2 J	5.6 J	2.9 U	47.3 J	13.9 J
2-Hexanone	9.8 UJ	9.8 UJ	5.5 UJ	4.1 UJ	3.9 U	4.9 UJ	4.3 U	5.8 UJ	2.7 U	9.1 UJ	3.7 U
4-Methyl-2-pentanone	12.1 UJ	12.1 UJ	6.8 UJ	5 UJ	4.8 U	6.1 UJ	5.3 U	7.1 UJ	3.3 U	11.2 UJ	4.5 U
Acetone	207 J	104 J	80.7 J	29.6 J	86.9	49.8 J	4.3 UJ	112 J	2.7 U	158 J	70
Benzene	3.8 UJ	3.8 UJ	2.1 UJ	1.6 UJ	1.5 U	1.9 UJ	1.6 U	2.2 UJ	1 U	3.5 UJ	1.4 U
Bromochloromethane	6.8 UJ	6.8 UJ	3.8 UJ	2.8 UJ	2.7 U	3.4 UJ	3 U	4 UJ	1.9 U	6.3 UJ	2.6 U
Bromodichloromethane	2.4 UJ	2.4 UJ	1.4 UJ	1 UJ	0.97 U	1.2 UJ	1 U	1.4 UJ	0.67 U	2.2 UJ	0.91 U
Bromoform	3.5 UJ	3.5 UJ	1.9 UJ	1.4 UJ	1.4 U	1.7 UJ	1.5 U	2 UJ	0.96 U	3.2 UJ	1.3 U
Bromomethane	7.6 UJ	7.5 UJ	4.2 UJ	3.1 UJ	3 U	3.8 UJ	3.3 U	4.4 UJ	2.1 U	7 UJ	2.8 U
Carbon disulfide	17 J	9.5 J	4 J	3.1 UJ	3 U	3.4 J	3.3 U	4.4 UJ	2.1 U	13 J	2.8 U
Carbon tetrachloride	4.5 UJ	4.5 UJ	2.5 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.2 U	4.2 UJ	1.7 U
Chlorobenzene	2.6 UJ	2.6 UJ	1.5 UJ	1.1 UJ	1.1 U	1.3 UJ	1.2 U	1.6 UJ	0.73 U	2.4 UJ	0.99 U
Chloroethane	5.6 UJ	5.6 UJ	3.1 UJ	2.3 UJ	2.2 U	2.8 UJ	2.4 U	3.3 UJ	1.5 U	5.2 UJ	2.1 U
Chloroform	4.1 UJ	4.1 UJ	2.3 UJ	1.7 UJ	1.6 U	2 UJ	1.8 U	2.4 UJ	1.1 U	3.8 UJ	1.5 U
Chloromethane	2.9 UJ	2.9 UJ	1.6 UJ	1.2 UJ	1.2 U	1.4 UJ	1.2 U	1.7 UJ	0.79 U	2.7 UJ	1.1 U
cis-1,2-Dichloroethene	4.7 UJ	4.7 UJ	2.6 UJ	1.9 UJ	1.9 U	2.4 UJ	2 U	2.7 UJ	1.3 U	4.3 UJ	1.8 U
cis-1,3-Dichloropropene	3.2 UJ	3.2 UJ	1.8 UJ	1.3 UJ	1.3 U	1.6 UJ	1.4 U	1.9 UJ	0.88 U	2.9 UJ	1.2 U
Cyclohexane	7.6 UJ	7.5 UJ	4.2 UJ	3.1 UJ	3 U	3.8 UJ	3.3 U	4.4 UJ	2.1 U	7 UJ	2.8 U
Dibromochloromethane	3.5 UJ	3.5 UJ	1.9 UJ	1.4 UJ	1.4 U	1.7 UJ	1.5 U	2 UJ	0.96 U	3.2 UJ	1.3 U
Dichlorodifluoromethane (Freon-12)	4.5 UJ	4.5 UJ	2.5 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.2 U	4.2 UJ	1.7 U
Ethylbenzene	5.2 UJ	5.2 UJ	2.9 UJ	2.2 UJ	2.1 U	2.6 UJ	2.3 U	3 UJ	1.4 U	4.8 UJ	2 U
Isopropylbenzene	4.5 UJ	4.5 UJ	2.5 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.2 U	4.2 UJ	1.7 U
Methyl acetate	15.1 UJ	15.1 UJ	8.5 UJ	6.3 UJ	6.1 U	7.6 UJ	6.6 U	8.9 UJ	4.2 U	14 UJ	5.7 U
Methylcyclohexane	3.2 UJ	3.2 UJ	1.8 UJ	1.4 UJ	1.3 U	1.6 UJ	1.4 U	1.9 UJ	0.9 U	3 UJ	1.2 U
Methylene chloride	9.1 UJ	9 UJ	5.1 UJ	3.8 UJ	3.6 U	4.6 UJ	4 U	5.3 UJ	2.5 U	8.4 UJ	3.4 U
Methyl-tert-butyl ether (MTBE)	3.2 UJ	3.2 UJ	1.8 UJ	1.4 UJ	1.3 U	1.6 UJ	1.4 U	1.9 UJ	0.9 U	3 UJ	1.2 U
Styrene	2.1 UJ	2.1 UJ	1.2 UJ	0.88 UJ	0.85 U	1.1 UJ	0.92 U	1.2 UJ	0.58 U	2 UJ	0.79 U
Tetrachloroethene	12 J	10.3 J	2.8 J	2.2 J	1.8 J	2.4 J	3.1 U	4.1 UJ	2 J	6.5 UJ	1.6 J
Toluene	2.2 UJ	2.2 UJ	1.2 UJ	0.91 UJ	0.88 U	1.1 UJ	0.96 U	1.3 UJ	0.6 U	2 UJ	0.82 U
trans-1,2-Dichloroethene	2.9 UJ	2.9 UJ	1.6 UJ	1.2 UJ	1.2 U	1.5 UJ	1.3 U	1.7 UJ	0.81 U	2.7 UJ	1.1 U
trans-1,3-Dichloropropene	7.6 UJ	7.5 UJ	4.2 UJ	3.1 UJ	3 U	3.8 UJ	3.3 U	4.4 UJ	2.1 U	7 UJ	2.8 U
Trichloroethene	3.3 UJ	3.3 UJ	1.9 UJ	1.4 UJ	1.3 U	1.7 UJ	1.4 U	2 UJ	0.92 U	3.1 UJ	1.2 U
Trichlorofluoromethane (Freon-11)	3.3 UJ	3.3 UJ	1.9 UJ	1.4 UJ	1.3 U	1.7 UJ	1.4 U	2 UJ	0.92 U	3.1 UJ	1.2 U
Vinyl chloride	4.5 UJ	4.5 UJ	2.5 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.2 U	4.2 UJ	1.7 U
Xylene, total	5.1 UJ	5.1 UJ	2.9 UJ	2.1 UJ	2.1 U	2.6 UJ	2.2 U	3 UJ	1.4 U	4.8 UJ	1.9 U
Semivolatile Organic Compounds (UG/KG)											
1-Methylnaphthalene	9 UJ	66.8 UJ	20.4 UJ	19.6 UJ	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
2-Methylnaphthalene	9 UJ	66.8 UJ	20.4 U	19.6 U	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Acenaphthene	9 UJ	66.8 UJ	20.4 U	11.9 J	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Acenaphthylene	9 UJ	66.8 UJ	20.4 U	19.6 U	17 UJ	18 UJ	20 J	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Anthracene	9.9 J	66.8 UJ	20.4 U	28.2	17 UJ	9.4 J	18.8 J	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Site										
Station ID	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010
Sample ID	VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211
Sample Date	02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11
Chemical Name											
Benzo(a)anthracene	10.1 J	70.3 UJ	39.7	66.7	22.6 J	59.9 J	102 J	4.7 J	2.7 UJ	63.2 J	20.2 J
Benzo(a)pyrene	11.2 UJ	83.6 UJ	77.8 J	65.1	24.5 J	62.5 J	110 J	6.7 J	3.3 UJ	96.7 J	25.2 J
Benzo(b)fluoranthene	11.2 UJ	83.6 UJ	124 J	87.4	40.5 J	96.1 J	160 J	10.7 J	3.3 UJ	155 J	36.1 J
Benzo(g,h,i)perylene	11.2 UJ	83.6 UJ	60 J	38.8	21.3 UJ	32.1 J	62.2 J	5.1 UJ	3.3 UJ	58.8 J	21.3 UJ
Benzo(k)fluoranthene	11.2 UJ	83.6 UJ	39.8 J	31.5	16.2 J	37.8 J	63.4 J	4.2 J	3.3 UJ	59.7 J	15.1 J
Chrysene	6.2 J	65.3 UJ	49.5	63.1	21.1 J	54.1 J	92.4 J	6.8 J	2.5 UJ	86.3 J	18.2 J
Dibenz(a,h)anthracene	11.2 UJ	83.6 UJ	25.6 U	24.5 U	21.3 UJ	22.5 UJ	45.6 UJ	5.1 UJ	3.3 UJ	41.5 UJ	21.3 UJ
Fluoranthene	14.8 J	66.8 UJ	49 J	91.7	29.5 J	72.9 J	122 J	8.5 J	2.6 UJ	92.6 J	25.2 J
Fluorene	9 UJ	66.8 UJ	20.4 U	11.6 J	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Indeno(1,2,3-cd)pyrene	11.2 UJ	83.6 UJ	50.5 J	34.9	21.3 UJ	33.7 J	61.4 J	5.1 UJ	3.3 UJ	55.5 J	21.3 UJ
Naphthalene	9 UJ	66.8 UJ	20.4 U	19.6 U	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Phenanthrene	4.6 J	66.8 UJ	27	111	9.1 J	9.8 J	36.4 UJ	4.1 UJ	2.6 UJ	26 J	8.7 J
Pyrene	10 J	66.8 UJ	67.4	125	31.9 J	63.6 J	106 J	7.3 J	2.6 UJ	108 J	32.8 J
Pesticide/Polychlorinated Biphenyls (UG/KG)											
4,4'-DDD	2.6 UJ	1.5 J	59 J	14 J	4.6 J	2.7 UJ	2.8 J	3.2 UJ	1 UJ	34 J	5.4 J
4,4'-DDE	1.4 UJ	1.1 J	94 J	28 J	9.7 J	2.9 J	5.9 J	1.7 UJ	0.54 UJ	66 J	7.5 J
4,4'-DDT	2 UJ	1.5 UJ	3.2 J	2.3 U	2 UJ	2 UJ	2.1 UJ	2.4 UJ	0.76 UJ	3.7 UJ	2 UJ
Aldrin	0.77 UJ	0.58 UJ	0.92 UJ	0.9 U	0.77 UJ	0.8 UJ	0.84 UJ	0.93 UJ	0.3 UJ	1.5 UJ	0.77 UJ
alpha-BHC	3.8 UJ	2.9 UJ	4.6 U	4.5 U	3.9 UJ	4 UJ	4.2 UJ	4.7 UJ	1.5 UJ	7.4 UJ	3.9 UJ
alpha-Chlordane	0.82 UJ	0.62 UJ	0.98 UJ	0.96 U	0.82 UJ	0.85 UJ	0.89 UJ	0.99 UJ	0.32 UJ	1.6 UJ	0.82 UJ
Aroclor-1016	67 UJ	50 UJ	40 U	39 U	34 UJ	35 UJ	36 UJ	40 UJ	26 UJ	64 UJ	33 UJ
Aroclor-1221	62 UJ	46 UJ	37 U	36 U	31 UJ	32 UJ	33 UJ	37 UJ	24 UJ	59 UJ	31 UJ
Aroclor-1232	77 UJ	58 UJ	46 U	45 U	39 UJ	40 UJ	42 UJ	47 UJ	30 UJ	74 UJ	39 UJ
Aroclor-1242	56 UJ	42 UJ	34 U	33 U	28 UJ	29 UJ	31 UJ	34 UJ	22 UJ	54 UJ	28 UJ
Aroclor-1248	56 UJ	42 UJ	34 U	33 U	28 UJ	29 UJ	31 UJ	34 UJ	22 UJ	54 UJ	28 UJ
Aroclor-1254	49 UJ	37 UJ	29 U	160	32 J	25 UJ	30 J	30 UJ	19 UJ	260 J	48 J
Aroclor-1260	31 UJ	24 UJ	19 U	18 U	16 UJ	16 UJ	17 UJ	19 UJ	12 UJ	30 UJ	16 UJ
beta-BHC	0.77 UJ	0.58 UJ	0.92 U	0.9 U	0.77 UJ	0.8 UJ	0.84 UJ	0.93 UJ	0.3 UJ	1.5 UJ	0.77 UJ
delta-BHC	1.4 UJ	1.1 UJ	1.7 UJ	1.7 U	1.4 UJ	1.5 UJ	1.6 UJ	1.7 UJ	0.56 UJ	2.8 UJ	1.4 UJ
Dieldrin	0.82 UJ	0.62 UJ	0.98 U	0.96 U	0.82 UJ	0.85 UJ	0.89 UJ	0.99 UJ	0.32 UJ	1.6 UJ	0.82 UJ
Endosulfan I	1.1 UJ	0.85 UJ	1.4 U	1.3 U	1.1 UJ	1.2 UJ	1.2 UJ	1.4 UJ	0.44 UJ	2.2 UJ	1.1 UJ
Endosulfan II	1.5 UJ	1.1 UJ	1.8 U	1.7 U	1.5 UJ	1.5 UJ	1.6 UJ	1.8 UJ	0.58 UJ	2.8 UJ	1.5 UJ
Endosulfan sulfate	1 UJ	0.77 UJ	1.2 U	1.2 U	1 UJ	1.1 UJ	1.1 UJ	1.2 UJ	0.4 UJ	2 UJ	1 UJ
Endrin	1.3 UJ	1 UJ	1.6 U	1.6 U	1.3 UJ	1.4 UJ	1.4 UJ	1.6 UJ	0.52 UJ	2.6 UJ	1.3 UJ
Endrin aldehyde	1.8 UJ	1.4 UJ	2.2 U	2.1 U	1.8 UJ	1.9 UJ	2 UJ	2.2 UJ	0.72 UJ	3.5 UJ	1.8 UJ
Endrin ketone	1.1 UJ	0.81 UJ	1.3 U	1.2 U	1.1 UJ	1.1 UJ	1.2 UJ	1.3 UJ	0.42 UJ	2.1 UJ	1.1 UJ
gamma-BHC (Lindane)	1 UJ	0.77 UJ	1.2 U	1.2 U	1 UJ	1.1 UJ	1.1 UJ	1.2 UJ	0.4 UJ	2 UJ	1 UJ
gamma-Chlordane	0.87 UJ	0.66 UJ	1 U	1 U	0.88 UJ	0.91 UJ	0.95 UJ	1 UJ	0.34 UJ	1.7 UJ	0.88 UJ
Heptachlor	1 UJ	0.77 UJ	1.2 U	1.2 U	1 UJ	1.1 UJ	1.1 UJ	1.2 UJ	0.4 UJ	2 UJ	1 UJ
Heptachlor epoxide	0.77 UJ	0.58 UJ	0.92 UJ	0.9 U	0.77 UJ	0.8 UJ	0.84 UJ	0.93 UJ	0.3 UJ	1.5 UJ	0.77 UJ
Methoxychlor	1.4 UJ	1 UJ	1.7 U	1.6 U	1.4 UJ	1.4 UJ	1.5 UJ	1.7 UJ	0.54 UJ	2.7 UJ	1.4 UJ
Toxaphene	130 UJ	96 UJ	150 U	150 U	130 UJ	130 UJ	140 UJ	160 UJ	50 UJ	250 UJ	130 UJ
Total Metals (MG/KG)											
Aluminum	14,500 J	12,600 J	8,980 J	7,820 J	10,700 J	7,030 J	5,720 J	5,460 J	2,120 J	14,400 J	6,030 J
Antimony	1.1 UJ	0.924 UJ	3.19 J	1.12 J	0.631 UJ	3.88 J	3.04 J	0.717 UJ	0.456 UJ	2.2 J	0.396 J
Arsenic	4 J	5.8 J	3.9	2.4	2.2 J	4 J	4.8 J	1.2 J	1.2 J	7.8 J	4.4 J
Barium	12.2 J	10.7 J	25.8	15.1	18.5 J	13.3 J	9.73 J	7.39 J	10.3 J	33.8 J	14.8 J
Beryllium	0.733 UJ	0.337 J	3.27 U	3.16 U	2.76 UJ	2.88 UJ	3.23 UJ	3.55 UJ	2.85 UJ	5.01 UJ	2.73 UJ
Cadmium	0.302 J	0.192 UJ	1.98 J	1.75 J	4.14 J	1.65 J	1 J	0.903 J	0.775 J	5.69 J	1.62 J
Calcium	101,000 J	48,000 J	114,000	94,400	87,100 J	140,000 J	106,000 J	93,800 J	105,000 J	72,900 J	110,000 J
Chromium	13.6 J	13.8 J	16.7	12.2	12.5 J	14.3 J	14.2 J	5.9 J	3.3 J	37 J	19.3 J
Chromium (hexavalent)	38.6 J	36.9 J	5.28	0.891 U	0.836 UJ	0.988 J	2.99 J	6.43 J	1.84 J	12 J	1.92 J
Cobalt	4.95 J	5.82 J	5.14	4.13 J	7.89 J	3.1 J	3.12 J	1.77 J	0.925 J	9 J	3.81 J
Copper	27.5 J	37.4 J	138 J	73.4 J	71.5 J	54.1 J	46.7 J	13.6 J	5.08 J	204 J	56.9 J
Iron	17,400 J	21,400 J	26,700	18,800	26,400 J	17,100 J	16,500 J	6,750 J	3,310 J	45,900 J	18,600 J
Lead	6.7 J	25.8 J	442	185	157 J	93 J	79.3 J	11.8 J	6.8 J	612 J	134 J
Magnesium	10,900 J	9,290 J	6,430 J	5,390 J	7,660 J	7,720 J	4,390 J	3,580 J	3,110 J	11,900 J	4,100 J

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Site										
Station ID	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010
Sample ID	VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211
Sample Date	02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11
Chemical Name											
Manganese	187 J	219 J	294	245	266 J	123 J	116 J	60.1 J	89.4 J	356 J	164 J
Mercury	0.039 J	0.104 J	0.088	0.0642	0.0446 J	0.0288 J	0.0336 J	0.0205 J	0.00742 J	0.129 J	0.0554 J
Nickel	5.94 J	6.92 J	10.2 J	6.41 J	11.4 J	8.36 J	5.54 J	3.55 UJ	2.85 UJ	19.1 J	6.66 J
Potassium	3,910 J	3,320 J	1,760	1,700	1,940 J	1,360 J	1,210 J	1,380 J	699 J	3,450 J	1,170 J
Selenium	1.5 UJ	1.5 UJ	0.93 U	0.92 U	0.61 UJ	0.62 UJ	0.63 UJ	0.84 UJ	0.47 UJ	1.4 UJ	0.57 UJ
Silver	0.733 UJ	0.616 UJ	0.295 J	0.246 J	0.42 UJ	0.406 UJ	0.492 UJ	0.478 UJ	0.304 UJ	0.787 UJ	0.368 UJ
Sodium	44,900 J	32,900 J	12,600 J	12,600 J	9,270 J	10,300 J	9,700 J	12,400 J	10,900 J	27,800 J	8,010 J
Thallium	1.56 UJ	1.32 J	6.96 U	6.72 U	5.17 J	6.13 UJ	6.86 UJ	7.55 UJ	6.05 UJ	10.6 UJ	5.8 UJ
Vanadium	40.8 J	43 J	38.6	32.6	59.7 J	26.7 J	21.5 J	17.6 J	9.58 J	66.1 J	29.8 J
Zinc	39.6 J	64.7 J	440	262	237 J	206 J	162 J	25.4 J	11 J	849 J	164 J
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)											
Acid volatile sulfide	8.9	7.4	0.17	0.53	0.15	0.38	NA	3.2	1.8	0.029 U	2.7
Cadmium, SEM	0.005 U	7.40E-04 J	0.0072	0.0039	0.016	0.0028	NA	0.0043	0.0014 U	0.0035 U	0.024
Copper, SEM	0.051 U	0.036 U	0.32	0.17	0.32	0.11	NA	0.12	0.013 J	0.092	0.22
Lead, SEM	0.026	0.081	1.3	0.43	0.54	0.24	NA	0.34	0.02	0.067	1.3
Mercury, SEM	1.10E-04 U	7.50E-05 U	1.40E-05 J	4.60E-05 U	4.10E-05 U	3.90E-05 U	NA	4.80E-05 U	3.00E-05 U	7.60E-05 U	4.00E-05 U
Nickel, SEM	0.013 J	0.012 J	0.044	0.022 J	0.032 J	0.023 J	NA	0.024 J	0.0029 J	0.0097 J	0.048
Silver, SEM	0.03 U	0.021 U	0.013 U	0.013 U	0.011 U	0.011 U	NA	0.014 U	0.0084 U	0.022 U	0.011 U
Zinc, SEM	0.31	0.48	3.8	1.4	2	1.6	NA	3.1	0.16	0.35	5.1
Wet Chemistry											
Ammonia (mg/kg)	351	167	60.6	62.5	53.1	41.5	NA	60.3	27.2	141	40.4
pH (ph)	7.4	7.65	7.75	7.8	7.85	7.76	NA	7.45	8.11	7.83	7.82
Redox (MV) (mv)	-1.81E+02	-1.30E+02	543	541	544	546	NA	526	532	536	538
Sulfide (mg/kg)	140	170	99	130	160	130	NA	70	19	54	89
Total organic carbon (TOC) (mg/kg)	35,000 J	45,000 J	18,000 J	16,000 J	13,000 J	16,000 J	NA	13,000 J	7,500	24,000 J	6,700
Grain Size (PCT)											
Gravel (%)	0.6	1.4	2.1	8.1	16.1	4.7	NA	0.6	0.4	0.8	1.4
Sand (%)	47.3	45.1	61.4	61.5	58.5	73.8	NA	77.2	84.5	27.9	72.7
Silt (%)	52.2	53.5	36.5	30.4	25.4	21.5	NA	22.2	15	71.2	25.9
GRAINSIZE (PCT Passing)											
GS05 Sieve 2" (50 mm)	100	100	100	100	100	100	NA	100	100	100	100
GS07 Sieve 1" (25.0 mm)	100	100	100	100	100	100	NA	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	100	100	100	94.7	87.9	97.4	NA	100	100	100	100
Sieve No. 004 (4.75 mm)	99.4	98.6	97.9	91.9	83.9	95.3	NA	99.4	99.6	99.2	98.6
Sieve No. 010 (2.00 mm)	97.6	95.8	95.5	87.4	77.8	90.9	NA	98.3	97.8	98.5	93.8
Sieve No. 030 (600-UM)	89.7	89.3	75.6	66.7	55.6	64	NA	75.5	65	96.1	70.4
Sieve No. 050 (300-UM)	81.2	83.3	60.5	52.4	41.8	43.9	NA	51.1	48	93.2	52.2
Sieve No. 100 (150 um)	64.8	71.1	46.3	39.1	31.8	29.2	NA	32	22.9	84.7	35.9
Sieve No. 200 (75 um)	52.2	53.5	36.5	30.4	25.4	21.5	NA	22.2	15	71.2	25.9

Notes:

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/KG - Milligrams per kilogram

MV - Millivolts

PCT - Percent

PH - pH units

UG/KG - Micrograms per kilogram

UMOL/G - Micromoles per gram

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Site (continued)		Background								
Station ID	VWW06-SD011		VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022
Sample ID	VWW06-SD011-0211	VWW06-SD011P-0211	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211
Sample Date	02/04/11	02/04/11	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name											
Volatile Organic Compounds (UG/KG)											
1,1,1-Trichloroethane	0.6 UJ	0.62 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	1.1 UJ	1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.2 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	1.5 UJ	1.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	0.63 UJ	0.66 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	0.63 UJ	0.66 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	1.1 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	1.2 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	4.6 UJ	4.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	1.5 UJ	1.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	1 UJ	1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	1.9 UJ	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1.2 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	0.84 UJ	0.87 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	1.2 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	2.6 UJ	2.7 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	2.4 UJ	2.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	3 UJ	3.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	4.6 J	2.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	0.93 UJ	0.96 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	1.7 UJ	1.7 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	0.6 UJ	0.62 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	0.86 UJ	0.89 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	1.9 UJ	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	1.9 UJ	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	1.1 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	0.65 UJ	0.67 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	1.4 UJ	1.4 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	1 UJ	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	0.71 UJ	0.73 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	1.2 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	0.78 UJ	0.81 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	1.9 UJ	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	0.86 UJ	0.89 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	1.1 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	1.3 UJ	1.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	1.1 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	3.7 UJ	3.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	0.8 UJ	0.83 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	2.2 UJ	2.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	0.8 UJ	0.83 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	0.52 UJ	0.54 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1.7 UJ	2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	0.54 UJ	0.56 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	0.72 UJ	0.75 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	1.9 UJ	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	0.82 UJ	0.85 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (Freon-11)	0.82 UJ	0.85 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	1.1 UJ	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, total	1.3 UJ	1.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/KG)											
1-Methylnaphthalene	11.6 UJ	11.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	11.6 UJ	11.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	11.6 UJ	11.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	11.6 UJ	11.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	11.6 UJ	11.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Site (continued)		Background								
Station ID	VWW06-SD011		VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022
Sample ID	VWW06-SD011-0211	VWW06-SD011P-0211	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211
Sample Date	02/04/11	02/04/11	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name											
Benzo(a)anthracene	30.6 J	12.3 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	29.1 J	20.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	41.2 J	29.7 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	17.2 J	13.6 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	15.2 J	11.7 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	26.5 J	16.3 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	14.5 UJ	14.2 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	43.6 J	13.9 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	11.6 UJ	11.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	16.8 J	13.3 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	11.6 UJ	11.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	17.5 J	11.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	38.8 J	13.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)											
4,4'-DDD	1.4 J	1.7 J	3.4 UJ	2.2 UJ	3.1 UJ	3.8 UJ	3.9 UJ	3.9 UJ	4.1 UJ	4.2 UJ	4.5 UJ
4,4'-DDE	14 J	16 J	1.3 J	1.1 UJ	1.6 UJ	2 UJ	2.1 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.4 UJ
4,4'-DDT	7 J	5.9 J	2.6 UJ	1.6 UJ	2.3 UJ	2.8 UJ	2.9 UJ	2.9 UJ	3 UJ	3.1 UJ	3.4 UJ
Aldrin	0.26 UJ	0.26 UJ	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ
alpha-BHC	1.3 UJ	1.3 UJ	5 UJ	3.2 UJ	4.6 UJ	5.5 UJ	5.8 UJ	5.8 UJ	6 UJ	6.2 UJ	6.6 UJ
alpha-Chlordane	0.27 UJ	0.28 UJ	1.1 UJ	0.68 UJ	0.98 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ
Aroclor-1016	22 UJ	22 UJ	87 UJ	55 UJ	80 UJ	96 UJ	61 UJ	61 UJ	63 UJ	65 UJ	70 UJ
Aroclor-1221	20 UJ	21 UJ	80 UJ	51 UJ	73 UJ	89 UJ	56 UJ	56 UJ	58 UJ	60 UJ	64 UJ
Aroclor-1232	26 UJ	26 UJ	100 UJ	64 UJ	92 UJ	110 UJ	70 UJ	70 UJ	72 UJ	75 UJ	81 UJ
Aroclor-1242	19 UJ	19 UJ	74 UJ	47 UJ	67 UJ	81 UJ	51 UJ	51 UJ	53 UJ	55 UJ	59 UJ
Aroclor-1248	19 UJ	19 UJ	74 UJ	47 UJ	67 UJ	81 UJ	51 UJ	51 UJ	53 UJ	55 UJ	59 UJ
Aroclor-1254	42 NJ	120 J	64 UJ	40 UJ	58 UJ	70 UJ	44 UJ	44 UJ	46 UJ	47 UJ	51 UJ
Aroclor-1260	10 UJ	10 UJ	41 UJ	26 UJ	37 UJ	45 UJ	28 UJ	28 UJ	29 UJ	30 UJ	33 UJ
beta-BHC	0.26 UJ	0.26 UJ	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ
delta-BHC	0.48 UJ	0.48 UJ	1.9 UJ	1.2 UJ	1.7 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.3 UJ	2.5 UJ
Dieldrin	0.27 UJ	0.28 UJ	1.1 UJ	0.68 UJ	0.98 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ
Endosulfan I	0.37 UJ	0.38 UJ	1.5 UJ	0.93 UJ	1.3 UJ	1.6 UJ	1.7 UJ	1.7 UJ	1.8 UJ	1.8 UJ	2 UJ
Endosulfan II	0.49 UJ	0.5 UJ	1.9 UJ	1.2 UJ	1.8 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.3 UJ	2.4 UJ	2.6 UJ
Endosulfan sulfate	0.34 UJ	0.35 UJ	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ
Endrin	0.44 UJ	0.45 UJ	1.7 UJ	1.1 UJ	1.6 UJ	1.9 UJ	2 UJ	2 UJ	2.1 UJ	2.1 UJ	2.3 UJ
Endrin aldehyde	0.61 UJ	0.62 UJ	2.4 UJ	1.5 UJ	2.2 UJ	2.7 UJ	2.8 UJ	2.8 UJ	2.9 UJ	3 UJ	3.2 UJ
Endrin ketone	0.36 UJ	0.36 UJ	1.4 UJ	0.89 UJ	1.3 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.7 UJ	1.7 UJ	1.9 UJ
gamma-BHC (Lindane)	0.34 UJ	0.35 UJ	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ
gamma-Chlordane	0.29 UJ	0.3 UJ	1.1 UJ	0.72 UJ	1 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ	1.4 UJ	1.5 UJ
Heptachlor	0.34 UJ	0.35 UJ	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ
Heptachlor epoxide	0.26 UJ	0.26 UJ	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ
Methoxychlor	0.46 UJ	0.47 UJ	1.8 U	1.1 UJ	1.6 UJ	2 UJ	2.1 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.4 UJ
Toxaphene	42 UJ	43 UJ	170 UJ	110 UJ	150 UJ	180 UJ	190 UJ	190 UJ	200 UJ	200 UJ	220 UJ
Total Metals (MG/KG)											
Aluminum	5,400 J	5,610 J	8,470 J	9,890 J	7,980 J	10,600 J	27,000 J	24,500 J	29,200 J	16,200 J	14,000 J
Antimony	0.484 UJ	0.452 UJ	1.33 UJ	0.89 UJ	1.35 UJ	1.51 UJ	1.01 UJ	1.17 UJ	1.03 UJ	1.02 UJ	1.09 UJ
Arsenic	1.2 J	0.96 J	2.5 UJ	2 J	1.4 UJ	2.1 J	5.9 J	5.5 J	2.6 J	6 J	6.2 J
Barium	49.8 J	48.6 J	8.21 J	7.11 J	9.6 J	11.3 J	14.8 J	14 J	19.8 J	11.6 J	9.56 J
Beryllium	2.59 UJ	2.94 UJ	0.89 UJ	0.593 UJ	0.902 UJ	1 UJ	0.648 J	0.478 J	0.612 J	0.678 UJ	0.38 J
Cadmium	0.5 J	0.918 UJ	0.175 J	0.185 UJ	0.282 UJ	0.314 UJ	0.211 UJ	0.244 UJ	0.214 UJ	0.212 UJ	0.227 UJ
Calcium	107,000 J	99,200 J	30,900 J	14,000 J	17,600 J	11,400 J	6,260 J	8,510 J	4,750 J	53,000 J	14,200 J
Chromium	6.5 J	6.6 J	10.9 J	20 J	10.3 J	6.7 J	14.9 J	13.7 J	15 J	14.1 J	14.8 J
Chromium (hexavalent)	1.74 J	2.38 J	24.8 J	150 J	30.5 J	101 J	33.9 J	36.8 J	34.1 J	24.6 J	9.34 J
Cobalt	3.4 J	4.05 J	3.81 J	3.94 J	3.3 J	4.47 J	8.48 J	7.33 J	7.01 J	5.03 J	5.08 J
Copper	57.6 J	72 J	29.7 J	23.4 J	37.1 J	28.5 J	44.6 J	42.4 J	47.6 J	32.1 J	32.5 J
Iron	11,200 J	11,900 J	10,400 J	9,300 J	14,400 J	8,870 J	35,300 J	34,000 J	29,400 J	19,600 J	20,000 J
Lead	12.1 J	12.7 J	3.94 J	4.64 J	6.38 J	7.08 J	12.6 J	11.3 J	12.2 J	6.18 J	6.06 J
Magnesium	5,280 J	5,380 J	13,000 J	9,920 J	11,000 J	15,800 J	9,660 J	9,420 J	8,880 J	9,550 J	10,300 J

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Site (continued)		Background								
Station ID	VWW06-SD011		VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022
Sample ID	VWW06-SD011-0211	VWW06-SD011P-0211	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211
Sample Date	02/04/11	02/04/11	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name											
Manganese	229 J	247 J	159 J	115 J	196 J	63 J	359 J	341 J	334 J	174 J	191 J
Mercury	0.00897 J	0.0106 J	0.0988 J	0.0669 J	0.131 J	0.0771 J	0.0985 J	0.0858 J	0.0707 J	0.043 J	0.0611 J
Nickel	3.03 J	3.56 J	7.15 J	7.3 J	5.8 J	5.16 J	8.43 J	7.88 J	8.6 J	7.1 J	6.79 J
Potassium	847 J	874 J	3,720 J	2,750 J	3,260 J	4,190 J	5,360 J	4,860 J	5,290 J	3,860 J	3,750 J
Selenium	0.54 UJ	0.43 UJ	2.5 UJ	1.1 UJ	1.4 UJ	2.1 UJ	1.6 UJ	1.4 J	1.9 J	4.4 J	2.6 J
Silver	0.322 UJ	0.301 UJ	0.89 UJ	0.593 UJ	0.902 UJ	1 UJ	0.674 UJ	0.78 UJ	0.684 UJ	0.678 UJ	0.726 UJ
Sodium	5,390 J	5,020 J	62,000 J	39,400 J	56,700 J	74,700 J	36,300 J	37,000 J	30,800 J	37,700 J	40,600 J
Thallium	5.5 UJ	6.24 UJ	1.89 UJ	1.26 UJ	1.92 UJ	2.14 UJ	1.43 UJ	1.7 J	1.45 UJ	1.44 UJ	1.54 UJ
Vanadium	32.7 J	35 J	29.4 J	42.4 J	20.7 J	58.6 J	54.7 J	46.8 J	56.3 J	44.5 J	43.7 J
Zinc	56.9 J	58 J	40.4 J	42.2 J	31.9 J	34.9 J	76 J	70.9 J	67.8 J	43.1 J	43.4 J
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)											
Acid volatile sulfide	0.01 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium, SEM	2.30E-04 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, SEM	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead, SEM	0.03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury, SEM	2.70E-05 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, SEM	0.008 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver, SEM	0.0077 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc, SEM	0.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry											
Ammonia (mg/kg)	37.7	36.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH (ph)	8.05	NA	7.22	7.17	7.26	7.07	7.3	7.25	7.05	7.52	7.3
Redox (MV) (mv)	538	NA	-1.58E+02	-1.48E+02	-1.52E+02	-1.56E+02	-1.21E+02	-1.25E+02	-1.54E+02	-1.19E+02	-1.05E+02
Sulfide (mg/kg)	33	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC) (mg/kg)	8,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Grain Size (PCT)											
Gravel (%)	7.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sand (%)	76.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silt (%)	16.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GRAINSIZE (PCT Passing)											
GS05 Sieve 2" (50 mm)	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GS07 Sieve 1" (25.0 mm)	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GS10 Sieve 0.375" (9.5 mm)	94.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 004 (4.75 mm)	92.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 010 (2.00 mm)	87.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 030 (600-UM)	60.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 050 (300-UM)	39.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 100 (150 um)	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 200 (75 um)	16.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/KG - Milligrams per kilogram

MV - Millivolts

PCT - Percent

PH - pH units

UG/KG - Micrograms per kilogram

UMOL/G - Micromoles per gram

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Background (continued)	
Station ID	VWW06-SD023	
Sample ID	VWW06-SD023-0211	VWW06-SD023P-0211
Sample Date	02/08/11	02/08/11
Chemical Name		
Volatile Organic Compounds (UG/KG)		
1,1,1-Trichloroethane	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	NA	NA
1,1,2-Trichloroethane	NA	NA
1,1-Dichloroethane	NA	NA
1,1-Dichloroethene	NA	NA
1,2,3-Trichlorobenzene	NA	NA
1,2,4-Trichlorobenzene	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA
1,2-Dibromoethane	NA	NA
1,2-Dichlorobenzene	NA	NA
1,2-Dichloroethane	NA	NA
1,2-Dichloropropane	NA	NA
1,3-Dichlorobenzene	NA	NA
1,4-Dichlorobenzene	NA	NA
2-Butanone	NA	NA
2-Hexanone	NA	NA
4-Methyl-2-pentanone	NA	NA
Acetone	NA	NA
Benzene	NA	NA
Bromochloromethane	NA	NA
Bromodichloromethane	NA	NA
Bromoform	NA	NA
Bromomethane	NA	NA
Carbon disulfide	NA	NA
Carbon tetrachloride	NA	NA
Chlorobenzene	NA	NA
Chloroethane	NA	NA
Chloroform	NA	NA
Chloromethane	NA	NA
cis-1,2-Dichloroethene	NA	NA
cis-1,3-Dichloropropene	NA	NA
Cyclohexane	NA	NA
Dibromochloromethane	NA	NA
Dichlorodifluoromethane (Freon-12)	NA	NA
Ethylbenzene	NA	NA
Isopropylbenzene	NA	NA
Methyl acetate	NA	NA
Methylcyclohexane	NA	NA
Methylene chloride	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA
Styrene	NA	NA
Tetrachloroethene	NA	NA
Toluene	NA	NA
trans-1,2-Dichloroethene	NA	NA
trans-1,3-Dichloropropene	NA	NA
Trichloroethene	NA	NA
Trichlorofluoromethane (Freon-11)	NA	NA
Vinyl chloride	NA	NA
Xylene, total	NA	NA
Semivolatile Organic Compounds (UG/KG)		
1-Methylnaphthalene	NA	NA
2-Methylnaphthalene	NA	NA
Acenaphthene	NA	NA
Acenaphthylene	NA	NA
Anthracene	NA	NA

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Background (continued)	
Station ID	VWW06-SD023	
Sample ID	VWW06-SD023-0211	VWW06-SD023P-0211
Sample Date	02/08/11	02/08/11
Chemical Name		
Benzo(a)anthracene	NA	NA
Benzo(a)pyrene	NA	NA
Benzo(b)fluoranthene	NA	NA
Benzo(g,h,i)perylene	NA	NA
Benzo(k)fluoranthene	NA	NA
Chrysene	NA	NA
Dibenz(a,h)anthracene	NA	NA
Fluoranthene	NA	NA
Fluorene	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA
Naphthalene	NA	NA
Phenanthrene	NA	NA
Pyrene	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)		
4,4'-DDD	3.6 UJ	3.5 UJ
4,4'-DDE	1.9 UJ	1.8 UJ
4,4'-DDT	2.6 UJ	2.6 UJ
Aldrin	1 UJ	1 UJ
alpha-BHC	5.2 UJ	5.1 UJ
alpha-Chlordane	1.1 UJ	1.1 UJ
Aroclor-1016	55 UJ	54 UJ
Aroclor-1221	51 UJ	50 UJ
Aroclor-1232	64 UJ	62 UJ
Aroclor-1242	46 UJ	45 UJ
Aroclor-1248	46 UJ	45 UJ
Aroclor-1254	40 UJ	39 UJ
Aroclor-1260	26 UJ	25 UJ
beta-BHC	1 UJ	1 UJ
delta-BHC	2 UJ	1.9 UJ
Dieldrin	1.1 UJ	1.1 UJ
Endosulfan I	1.5 UJ	1.5 UJ
Endosulfan II	2 UJ	2 UJ
Endosulfan sulfate	1.4 UJ	1.4 UJ
Endrin	1.8 UJ	1.8 UJ
Endrin aldehyde	2.5 UJ	2.4 UJ
Endrin ketone	1.5 UJ	1.4 UJ
gamma-BHC (Lindane)	1.4 UJ	1.4 UJ
gamma-Chlordane	1.2 UJ	1.2 UJ
Heptachlor	1.4 UJ	1.4 UJ
Heptachlor epoxide	1 UJ	1 UJ
Methoxychlor	1.9 UJ	1.8 UJ
Toxaphene	170 UJ	170 UJ
Total Metals (MG/KG)		
Aluminum	16,900 J	16,600 J
Antimony	0.974 UJ	0.835 UJ
Arsenic	3.1 J	2.8 J
Barium	12 J	11.3 J
Beryllium	0.395 J	0.339 J
Cadmium	0.203 UJ	0.174 UJ
Calcium	25,400 J	25,400 J
Chromium	15 J	15.1 J
Chromium (hexavalent)	30.4 J	3.63 J
Cobalt	5.26 J	5.18 J
Copper	39.6 J	37.4 J
Iron	23,500 J	22,800 J
Lead	6.94 J	6.35 J
Magnesium	9,390 J	8,700 J

Appendix A
Sediment Analytical Summary Table
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Background (continued)	
Station ID	VWW06-SD023	
Sample ID	VWW06-SD023-0211	VWW06-SD023P-0211
Sample Date	02/08/11	02/08/11
Chemical Name		
Manganese	250 J	248 J
Mercury	0.0754 J	0.0676 J
Nickel	7.44 J	7.15 J
Potassium	3,910 J	3,490 J
Selenium	1.6 J	1.5 J
Silver	0.649 UJ	0.557 UJ
Sodium	32,200 J	28,800 J
Thallium	1.24 J	0.707 J
Vanadium	33.6 J	35.2 J
Zinc	51.4 J	49.6 J
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)		
Acid volatile sulfide	NA	NA
Cadmium, SEM	NA	NA
Copper, SEM	NA	NA
Lead, SEM	NA	NA
Mercury, SEM	NA	NA
Nickel, SEM	NA	NA
Silver, SEM	NA	NA
Zinc, SEM	NA	NA
Wet Chemistry		
Ammonia (mg/kg)	NA	NA
pH (ph)	7.23	6.96
Redox (MV) (mv)	-1.54E+02	-1.51E+02
Sulfide (mg/kg)	NA	NA
Total organic carbon (TOC) (mg/kg)	NA	NA
Grain Size (PCT)		
Gravel (%)	NA	NA
Sand (%)	NA	NA
Silt (%)	NA	NA
GRAINSIZE (PCT Passing)		
GS05 Sieve 2" (50 mm)	NA	NA
GS07 Sieve 1" (25.0 mm)	NA	NA
GS10 Sieve 0.375" (9.5 mm)	NA	NA
Sieve No. 004 (4.75 mm)	NA	NA
Sieve No. 010 (2.00 mm)	NA	NA
Sieve No. 030 (600-UM)	NA	NA
Sieve No. 050 (300-UM)	NA	NA
Sieve No. 100 (150 um)	NA	NA
Sieve No. 200 (75 um)	NA	NA

Notes:

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

U - Not detected or not detected at significantly greater than that in an associated blank

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/KG - Milligrams per kilogram

MV - Millivolts

PCT - Percent

PH - pH units

UG/KG - Micrograms per kilogram

UMOL/G - Micromoles per gram

Appendix B
Post-Removal Biota Data Tables

Appendix B
Post-removal Supplemental Confirmatory Biota Sampling Data (Jan.-Feb. 2012)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, PR

Station ID	Background									
Sample ID	VWW06-CRB05-0212	VWW06-CRB05P-0212	VWW06-CRB06-0112	VWW06-CRB07-0112	VWW06-CRB08-0112	VWW06-FS05-0212	VWW06-FS05P-0212	VWW06-FS06-0112	VWW06-FS07-0112	VWW06-FS08-0212
Sample Date	02/01/12	02/01/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	01/31/12	01/31/12	02/01/12
Chemical Name										
Polychlorinated Biphenyl Congeners (PG/G)										
2-Chlorobiphenyl (1)	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	9.5 U	1.9 U	2 U
3-Chlorobiphenyl (2)	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	9.5 U	3.9 J	1.8 J
4-Chlorobiphenyl (3)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	1.1 J	0.98 U	4.8 U	1.3 J	1.3 J
2,2'-Dichlorobiphenyl (4)	9.7 U	9.9 U	9.8 U	9.5 U	9.7 U	9.7 U	9.8 U	48 U	9.6 U	9.9 U
2,3-Dichlorobiphenyl (5)	9.7 U	9.9 U	9.8 U	9.5 U	9.7 U	9.7 U	9.8 U	48 U	9.6 U	9.9 U
2,3'-Dichlorobiphenyl (6)	9.7 U	9.9 U	9.8 U	9.5 U	9.7 U	9.7 U	9.8 U	48 U	9.6 U	9.9 U
2,4-Dichlorobiphenyl (7)	9.7 U	9.9 U	9.8 U	9.5 U	9.7 U	9.7 U	9.8 U	48 U	9.6 U	9.9 U
2,4'-Dichlorobiphenyl (8)	9.7 U	9.9 U	3.4 J	6.8 J	5.8 J	9.7 U	9.8 U	48 U	9.6 U	9.9 U
2,5-Dichlorobiphenyl (9)	9.7 U	9.9 U	9.8 U	9.5 U	9.7 U	9.7 U	9.8 U	48 U	9.6 U	9.9 U
2,6-Dichlorobiphenyl (10)	9.7 U	9.9 U	9.8 U	9.5 U	9.7 U	9.7 U	9.8 U	48 U	9.6 U	9.9 U
3,3'-Dichlorobiphenyl (11)	8.6 J	21	14 J	12 J	11 J	8.2 J	9.8 U	48 U	13 J	11 J
3,5-Dichlorobiphenyl (14)	9.7 U	9.9 U	9.8 U	9.5 U	9.7 U	9.7 U	9.8 U	48 U	9.6 U	9.9 U
4,4'-Dichlorobiphenyl (15)	9.7 U	9.9 U	9.8 U	9.5 U	9.7 U	9.7 U	9.8 U	48 U	9.6 U	9.9 U
2,2',3-Trichlorobiphenyl (16)	0.97 U	0.99 U	0.98 U	2.2 J	3 J	0.81 J	0.98 U	4.8 U	0.7 J	0.71 J
2,2',4-Trichlorobiphenyl (17)	0.97 U	0.99 U	0.98 U	6.2 J	5.2 J	1.1 J	0.98 U	4.8 U	0.74 J	0.86 J
2,2',6-Trichlorobiphenyl (19)	0.97 U	0.99 U	0.98 U	2.6 J	2.1 J	0.97 U	0.98 U	4.8 U	0.96 U	1.3 J
2,3,4'-Trichlorobiphenyl (22)	0.97 U	0.99 U	0.98 U	10 J	6.7 J	1.2 J	0.98 U	4.8 U	1.8 J	1.6 J
2,3,5-Trichlorobiphenyl (23)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,6-Trichlorobiphenyl (24)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3',4-Trichlorobiphenyl (25)	0.97 U	0.99 U	0.98 U	4 J	3 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3',6-Trichlorobiphenyl (27)	0.97 U	0.99 U	0.98 U	1.2 J	0.84 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,4',5-Trichlorobiphenyl (31)	1.2 J	1.5 J	1.4 J	35 J	28 J	5 J	2.5 J	4.8 U	6.4 J	7.2 J
2,4',6-Trichlorobiphenyl (32)	0.52 J	0.59 J	0.98 U	12 J	7 J	1.3 J	0.98 U	4.8 U	0.96 U	1.3 J
2,3',5'-Trichlorobiphenyl (34)	0.97 U	0.99 U	0.98 U	0.63 J	0.86 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
3,3',4-Trichlorobiphenyl (35)	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	9.5 U	1.9 U	2 U
3,3',5-Trichlorobiphenyl (36)	0.97 U	0.99 U	0.98 U	4.1 J	2.4 J	0.97 U	0.98 U	4.8 U	0.96 U	0.74 J
3,4,4'-Trichlorobiphenyl (37)	0.97 U	0.99 U	0.98 U	5 J	2.4 J	1 J	0.98 U	4.8 U	1.1 J	1.3 J
3,4,5-Trichlorobiphenyl (38)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
3,4',5-Trichlorobiphenyl (39)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,4-Tetrachlorobiphenyl (41)	0.97 U	0.99 U	0.98 U	1.5 J	1 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,4'-Tetrachlorobiphenyl (42)	0.97 U	0.99 U	0.98 U	15 J	10 J	0.8 J	0.98 U	4.8 U	0.96 U	2.2 J
2,2',3,5-Tetrachlorobiphenyl (43)	0.97 U	0.99 U	0.98 U	1.9 J	1.3 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,6-Tetrachlorobiphenyl (45)	0.97 U	0.99 U	0.98 U	3.3 J	3.9 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,6'-Tetrachlorobiphenyl (46)	0.97 U	0.99 U	0.98 U	1.6 J	1.6 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',4,5-Tetrachlorobiphenyl (48)	0.97 U	0.99 U	0.98 U	8.5 J	6.3 J	0.97 U	0.98 U	4.8 U	0.76 J	1.5 J
2,2',4,6'-Tetrachlorobiphenyl (51)	1.6 J	1 J	1.6 J	9.6 J	3.8 J	1.5 J	1.6 J	4.8 U	1.9 J	1.5 J
2,2',5,5'-Tetrachlorobiphenyl (52)	2.8 J	3.8 J	5.5 J	440	210	34 J	14 J	14 J	34	68
2,2',6,6'-Tetrachlorobiphenyl (54)	0.97 U	0.99 U	0.98 U	0.57 J	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.66 J
2,3,3',4-Tetrachlorobiphenyl (55)	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	9.5 U	1.9 U	2 U
2,3,3',4'-Tetrachlorobiphenyl (56)	0.97 U	0.99 U	0.98 U	45	27	2.2 J	0.98 U	4.8 U	4.3 J	5.7 J
2,3,3',5-Tetrachlorobiphenyl (57)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',5'-Tetrachlorobiphenyl (58)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,4,4'-Tetrachlorobiphenyl (60)	1.2 J	2 U	2 U	24	17 J	2.1 J	2 U	9.5 U	3.5 J	4.9 J
2,3,4',5-Tetrachlorobiphenyl (63)	0.97 U	0.99 U	0.98 U	8 J	4.7 J	0.97 U	0.98 U	4.8 U	0.98 J	1.2 J
2,3,4',6-Tetrachlorobiphenyl (64)	1.3 J	1.2 J	1 J	55	32	4.5 J	1.9 J	4.8 U	4.8 J	9.3 J
2,3',4,4'-Tetrachlorobiphenyl (66)	6.8 J	8.2 J	4.4 J	190	120	12 J	8 J	7.7 J	20	28
2,3',4,5-Tetrachlorobiphenyl (67)	0.97 U	0.99 U	0.98 U	5.4 J	3.4 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3',4,5'-Tetrachlorobiphenyl (68)	1.9 U	2 U	2 U	4 J	2.5 J	1.9 U	2 U	9.5 U	1.9 U	1.7 J
2,3',5,5'-Tetrachlorobiphenyl (72)	0.97 U	0.99 U	0.98 U	4.8 J	2.7 J	0.97 U	0.98 U	4.8 U	0.69 J	0.69 J
2,3',5',6-Tetrachlorobiphenyl (73)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
3,3',4,4'-Tetrachlorobiphenyl (77)	0.77 J	0.54 J	0.98 U	8.2	4.3	0.97 U	0.98 U	4.8 U	2	1.7 J
3,3',4,5-Tetrachlorobiphenyl (78)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
3,3',4,5'-Tetrachlorobiphenyl (79)	0.97 U	0.99 U	0.98 U	4.8 J	2 J	0.97 U	0.98 U	4.8 U	0.96 U	0.98 J
3,3',5,5'-Tetrachlorobiphenyl (80)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
3,4,4',5-Tetrachlorobiphenyl (81)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,3',4-Pentachlorobiphenyl (82)	0.97 U	0.99 U	0.98 U	35	15 J	0.97 U	0.98 U	4.8 U	0.96 U	1.6 J
2,2',3,3',5-Pentachlorobiphenyl (83)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	2.4 J	6.3 J
2,2',3,3',6-Pentachlorobiphenyl (84)	0.97 U	1.3 J	1.9 J	120	47	4.6 J	2.3 J	4.8 U	7 J	15 J
2,2',3,4,6'-Pentachlorobiphenyl (89)	0.97 U	0.99 U	0.98 U	3.6 J	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,5,5'-Pentachlorobiphenyl (92)	0.97 U	1.4 J	2.5 J	230	95	9.2 J	4.8 J	4.8 U	16 J	25
2,2',3,5,6'-Pentachlorobiphenyl (94)	0.97 U	0.99 U	0.98 U	2.2 J	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,5',6-Pentachlorobiphenyl (95)	2.4 J	3.5 J	5.9 J	540	180	26 J	11 J	7.6 J	35	70
2,2',3,6,6'-Pentachlorobiphenyl (96)	0.97 U	0.99 U	0.98 U	1 J	0.69 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',4,4',5-Pentachlorobiphenyl (99)	18 J	20 J	9.8 J	580	280	24	20 J	21 J	43	54
2,2',4,5',6-Pentachlorobiphenyl (103)	0.97 U	0.99 U	0.98 U	7.1 J	3 J	0.97 U	0.98 U	4.8 U	0.96 U	1.1 J
2,2',4,6,6'-Pentachlorobiphenyl (104)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U

Appendix B
Post-removal Supplemental Confirmatory Biota Sampling Data (Jan.-Feb. 2012)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, PR

Station ID	Background									
Sample ID	VWW06-CRB05-0212	VWW06-CRB05P-0212	VWW06-CRB06-0112	VWW06-CRB07-0112	VWW06-CRB08-0112	VWW06-FS05-0212	VWW06-FS05P-0212	VWW06-FS06-0112	VWW06-FS07-0112	VWW06-FS08-0212
Sample Date	02/01/12	02/01/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	01/31/12	01/31/12	02/01/12
Chemical Name										
2,3,3',4,4'-Pentachlorobiphenyl (105)	9.8 J	11	4.8	270	130	13	13	15	20	17
2,3,3',4,5-Pentachlorobiphenyl (106)	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	9.5 U	1.9 U	2 U
2,3,3',4,6-Pentachlorobiphenyl (109)	1.9 J	2.2 J	2 U	69	31	2.9 J	2.1 J	2.1 J	4.5 J	4.8 J
2,3,3',5,5'-Pentachlorobiphenyl (111)	0.97 U	0.99 U	0.98 U	0.96 J	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',5,6-Pentachlorobiphenyl (112)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,4,4',5-Pentachlorobiphenyl (114)	0.97 U	0.99 U	0.98 U	19	9.4	0.97 U	0.98 U	4.8 U	0.9 J	0.93 J
2,3',4,4',5-Pentachlorobiphenyl (118)	32	34	14	970	440	34	34	39	60	61
2,3',4,5,5'-Pentachlorobiphenyl (120)	0.97 U	0.99 U	0.98 U	5 J	2.5 J	0.97 U	0.98 U	4.8 U	0.93 J	0.99 U
2,3',4,5',6-Pentachlorobiphenyl (121)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',4',5'-Pentachlorobiphenyl (122)	0.97 U	0.99 U	0.98 U	9.8 J	4.5 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3',4,4',5'-Pentachlorobiphenyl (123)	0.97 U	0.99 U	0.98 U	8.2	5.6	0.97 U	0.98 U	4.8 U	0.91 J	1.1 J
3,3',4,4',5-Pentachlorobiphenyl (126)	0.97 U	0.99 U	0.98 U	2.2	1.2 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
3,3',4,5,5'-Pentachlorobiphenyl (127)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,3',4,5'-Hexachlorobiphenyl (130)	1.6 J	2.2 J	0.98 U	78	29	1.5 J	0.98 U	4.8 U	4.1 J	4.1 J
2,2',3,3',4,6-Hexachlorobiphenyl (131)	0.97 U	0.99 U	0.98 U	3.9 J	2.9 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	0.97 U	0.71 J	1.8 J	220	69	4.2 J	3.2 J	4.8 U	7.8 J	11 J
2,2',3,3',5,5'-Hexachlorobiphenyl (133)	0.97 U	0.99 U	0.98 U	18 J	9 J	0.97 U	0.98 U	4.8 U	2.1 J	1.8 J
2,2',3,3',6,6'-Hexachlorobiphenyl (136)	0.97 U	0.99 U	0.71 J	67	27	2.5 J	0.98 U	4.8 U	4.8 J	8.1 J
2,2',3,4,4',5-Hexachlorobiphenyl (137)	0.62 J	0.99 U	0.98 U	42	17 J	0.97 U	0.98 U	4.8 U	2.1 J	1.4 J
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	0.97 U	1 J	1.4 J	160	62	4.4 J	3.6 J	4.8 U	9.2 J	9.2 J
2,2',3,4,5,6-Hexachlorobiphenyl (142)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,4,5',6-Hexachlorobiphenyl (144)	0.97 U	0.99 U	0.98 U	29	12 J	0.97 U	0.98 U	4.8 U	2.2 J	2.4 J
2,2',3,4,6,6'-Hexachlorobiphenyl (145)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	4 J	4.4 J	1.5 J	140	64	7.5 J	9.4 J	9 J	13 J	11 J
2,2',3,4',5,6'-Hexachlorobiphenyl (148)	0.97 U	0.99 U	0.98 U	0.76 J	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,4',6,6'-Hexachlorobiphenyl (150)	0.97 U	0.99 U	0.98 U	0.83 J	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,5,6,6'-Hexachlorobiphenyl (152)	0.97 U	0.99 U	0.98 U	0.37 J	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',4,4',5,6'-Hexachlorobiphenyl (154)	0.97 U	0.8 J	0.98 U	11 J	6.3 J	0.97 U	0.98 U	4.8 U	2 J	1.5 J
2,2',4,4',6,6'-Hexachlorobiphenyl (155)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',4,4',6-Hexachlorobiphenyl (158)	3.4 J	3.5 J	1.5 J	120	49	3.2 J	3.6 J	4.8 U	6.1 J	4.9 J
2,3,3',4,5,5'-Hexachlorobiphenyl (159)	0.97 U	0.99 U	0.98 U	2.2 J	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',4,5,6-Hexachlorobiphenyl (160)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',4,5',6-Hexachlorobiphenyl (161)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',4',5,5'-Hexachlorobiphenyl (162)	0.97 U	0.99 U	0.98 U	6.6 J	3.4 J	0.97 U	0.98 U	4.8 U	0.96 U	0.97 J
2,3,3',4',5',6-Hexachlorobiphenyl (164)	0.97 U	0.99 U	0.98 U	70	23	0.97 U	0.98 U	4.8 U	2.6 J	2.5 J
2,3,3',5,5',6-Hexachlorobiphenyl (165)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	1.8 J	1.6 J	0.7 J	55	24	2.3 J	2 J	4.8 U	3.3	2.7 J
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	5.8 J	5 J	2.5 J	130	67	9.2 J	13 J	13 J	16 J	12 J
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	1.3 J	1.4 J	0.98 U	24	14 J	2.8 J	3.3 J	4.8 U	4.1 J	3.6 J
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	0.97 U	0.99 U	0.98 U	100	28	2.4 J	2.3 J	4.8 U	4.8 J	7.3 J
2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	0.97 U	0.99 U	0.98 U	3.8 J	0.97 U	0.97 U	0.98 U	4.8 U	0.86 J	0.99 U
2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	0.97 U	0.99 U	0.98 U	7.1 J	4.1 J	0.97 U	0.98 U	4.8 U	0.96 J	0.91 J
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	2.7 J	2.9 J	0.98 U	81	26	2.9 J	3.4 J	4.8 U	3.8 J	6.2 J
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	1.5 J	1.4 J	0.98 U	24	14 J	1.6 J	0.98 U	4.8 U	5.2 J	4.5 J
2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	0.97 U	0.99 U	0.98 U	29	16 J	0.61 J	0.98 U	4.8 U	3.1 J	3.2 J
2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	1.9 U	2 U	2 U	2.9 J	1.3 J	1.9 U	2 U	9.5 U	1.9 U	2 U
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	2.6 J	2.6 J	2 U	61	32	5.8 J	5.6 J	4.7 J	10 J	7.6 J
2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.66 J	0.62 J
2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	1.9 U	2 U	2 U	7.2 J	3.8 J	1.9 U	2 U	9.5 U	1.9 U	2 U
2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	4.5 J	4.7 J	0.88 J	120	63	15 J	19 J	14 J	17 J	20 J
2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	1.4 J	1.3 J
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	0.97 U	0.99 U	0.98 U	4.5	2.8	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	0.97 U	0.99 U	0.98 U	21	9.1 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	0.97 U	0.99 U	0.98 U	6 J	2.3 J	0.97 U	0.98 U	4.8 U	0.92 J	0.99 U
2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	1.4 J	1.2 J	0.98 U	25	21	3.2 J	3.7 J	4.8 U	5 J	2.6 J
2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	0.97 U	0.99 U	0.98 U	10 J	7.2 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	1 J	1 J	0.98 U	15 J	9.2 J	3.9 J	4.4 J	5.6 J	5.5 J	4.3 J
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	0.97 U	0.99 U	0.98 U	1.2 J	1 J	0.81 J	1.2 J	4.8 U	1.5 J	1.4 J
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	1.9 U	2 U	2 U	2 J	2.1 J	1.9 U	2 U	9.5 U	1.9 U	2 U
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	0.97 U	0.99 U	0.98 U	4.1 J	3.5 J	2 J	2 J	2 J	3.4 J	3.4 J
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	0.97 J	1.3 J	0.98 U	11 J	8.6 J	2 J	2.6 J	4.3 J	7.2 J	6.2 J
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	1.2 J	0.92 J	0.98 U	28	21	2.8 J	3.2 J	4.8 U	2 J	1.5 J
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	0.97 U	0.99 U	0.98 U	0.95 U	0.97 U	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	0.97 U	0.99 U	0.98 U	1.2 J	0.97 J	0.97 U	0.98 U	4.8 U	0.96 U	0.99 U

Appendix B
Post-removal Supplemental Confirmatory Biota Sampling Data (Jan.-Feb. 2012)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, PR

Station ID	Background									
Sample ID	VWW06-CRB05-0212	VWW06-CRB05P-0212	VWW06-CRB06-0112	VWW06-CRB07-0112	VWW06-CRB08-0112	VWW06-FS05-0212	VWW06-FS05P-0212	VWW06-FS06-0112	VWW06-FS07-0112	VWW06-FS08-0212
Sample Date	02/01/12	02/01/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	01/31/12	01/31/12	02/01/12
Chemical Name										
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	0.97 U	0.99 U	0.98 U	14 J	12 J	4.6 J	6.3 J	4.8 U	1.9 J	3.1 J
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	0.97 U	0.99 U	0.98 U	1.8 J	2 J	1.8 J	2 J	4.8 U	0.96 U	0.99 U
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	1.5 J	0.88 J	0.98 U	6 J	4.8 J	3.8 J	5 J	4.8 U	1.8 J	1.8 J
Decachlorobiphenyl (209)	1.9 U	2 U	2 U	4.6 J	5 J	4.4 J	4.5 J	4.4 J	2.3 J	2 U
Congeners (13/12)	19 U	20 U	20 U	19 U	19 U	19 U	20 U	95 U	19 U	20 U
Congeners (21/33)	1.9 U	2 U	2 U	17 J	11 J	2.1 J	2 U	9.5 U	1.8 J	2.4 J
Congeners (26/29)	1.9 U	2 U	2 U	7.7 J	6.4 J	0.82 J	0.67 J	9.5 U	1.2 J	1.3 J
Congeners (28/20)	2.5 J	2.7 J	2 U	52	42 J	6.6 J	4.2 J	9.5 U	8.4 J	8.9 J
Congeners (30/18)	1.9 U	2 U	2 U	11 J	11 J	2 J	2 U	9.5 U	1.9 U	2 U
Congeners (40/71)	0.85 J	1.1 J	0.78 J	33 J	16 J	2.2 J	0.84 J	9.5 U	2.1 J	4.3 J
Congeners (44/47/65)	11 J	11 J	10 J	160	95	19 J	13 J	14 U	20 J	33 J
Congeners (50/53)	1.9 U	2 U	2 U	20	8.3 J	1.6 J	2 U	9.5 U	1.1 J	2.1 J
Congeners (59/62/75)	2.9 U	3 U	2.9 U	10	6.5 J	0.87 J	2.9 U	14 U	0.73 J	1.9 J
Congeners (61/70/74/76)	7.6 J	7.4 J	8.5 J	420	210	24 J	15 J	19 U	44 J	65 J
Congeners (69/49)	1.1 J	0.85 J	2.3 J	150	80	12 J	5.3 J	9.5 U	11 J	23 J
Congeners (86/87/97/108/119/125)	3 J	3.4 J	7.2 J	520	220	18 J	9.8 J	5.6 J	34 J	50 J
Congeners (88/91)	1.9 U	1.4 J	1.4 J	100	31 J	5.2 J	2.2 J	9.5 U	6.6 J	13 J
Congeners (93/100)	1.9 U	2 U	2 U	5.5 J	1.8 J	1.9 U	2 U	9.5 U	1.9 U	2 U
Congeners (98/102)	1.9 U	2 U	2 U	17 J	3.7 J	1.9 U	2 U	9.5 U	1.9 U	1.8 J
Congeners (107/124)	5.8 U	5.9 U	5.9 U	39	16 J	5.8 U	5.9 U	28 U	2.1 J	2.4 J
Congeners (110/115)	18 J	21 J	15 J	1,100	500	33 J	19 J	12 J	65	95
Congeners (113/90/101)	7.3 J	9.2 J	16 J	1,300	550	47 J	28 J	25 J	90	130
Congeners (117/116/85)	4.6 J	4.7 J	2.5 J	170	75	6.6 J	3.4 J	14 U	11 J	12 J
Congeners (128/166)	4.5 J	4.8 J	1.2 J	160	73	5.1 J	6.5 J	9.5 U	8.2 J	7.3 J
Congeners (134/143)	1.9 U	2 U	2 U	28 J	14 J	1.9 U	2 U	9.5 U	1.3 J	1.3 J
Congeners (138/163/129)	33	35 J	10 J	1,100	490	40 J	45	48 J	65	56 J
Congeners (139/140)	1.9 U	2 U	2 U	20 J	8.8 J	1.9 U	2 U	9.5 U	1.4 J	1 J
Congeners (147/149)	4.4 J	6.4 J	5.9 J	610	160	14 J	8.2 J	7.9 J	27 J	40
Congeners (151/135)	1.9 U	1.4 J	2.3 J	210	83	6 J	3.6 J	9.5 U	15 J	18 J
Congeners (153/168)	35	37	11 J	900	420	45	51	50 J	75	63
Congeners (156/157)	5.2	4.9	1.5 J	150	68	4.7	5.7	5.6 J	6.2	5.3
Congeners (171/173)	1.7 J	1.7 J	2 U	44	23 J	1.9 U	2.4 J	9.5 U	5.9 J	3.6 J
Congeners (180/193)	11 J	12 J	2.7 J	230	120	22 J	26	27 J	40	30 J
Congeners (198/199)	2.6 J	2.3 J	2 U	45	29	12 J	16 J	17 J	15 J	16 J
Total Dichlorobiphenyls	8.6	21	17	21	17	8.2	0 U	0 U	13	11
Total Heptachlorobiphenyls	31	32	7	910	420	62	75	58	120	99
Total Hexachlorobiphenyls	94	100	40	4,200	1,700	140	140	120	260	250
Total Monochlorobiphenyls	0 U	0 U	0 U	0 U	1.8	1.1	0 U	0 U	5.3	4
Total Nonachlorobiphenyls	1.5	0.88	0 U	21	18	10	13	0 U	4.5	4.9
Total Octachlorobiphenyls	7.3	7.6	0 U	140	100	27	33	28	39	35
Total Pentachlorobiphenyls	97	110	83	6,100	2,600	220	150	130	400	570
Total Tetrachlorobiphenyls	37	37	37	1,600	870	120	60	55	150	260
Total Trichlorobiphenyls	4.9	7.4	4.8	170	130	22	11	11	25	30
Total Non-Dioxin-Like Congeners	230	260	160	12,000	5,200	560	430	300	920	1,200
PCB (total)	280	320	180	13000	5900	620	480	360	1000	1200
Toxic Equivalents (Total TEQ)	0.0015	0.0016	0.00063	0.26	0.14	0.0016	0.0016	0.0018	0.0029	0.0028
Total Metals (MG/KG)										
Lead	0.033 J	0.037 J	0.022 J	0.066	0.053	0.008 U	0.008 U	0.008 U	0.017 J	0.02 J
Thallium	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Zinc	19	19.2	13.8	20.7	13.7	11.3	10.1	13.2	15.2 J	16.4
Wet Chemistry (PCT)										
% Solids	34.3	37.3	40.59	33.4	36.5	24.3	27.1	27	37.7	48.7
Lipids (%)	0.42	0.46	0.32	0.58	0.42	1.8	2.3	2.5	6.7	2.8

Notes:

J - Estimated

U - Nondetect or not detected at significantly greater than that in an associated blank.

MG/KG - Milligrams per kilogram

PCT - Percent

PG/G - Picograms per gram

Appendix B
Post-removal Supplemental Confirmatory Biota Sampling Data (Jan.-Feb. 2012)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, PR

Station ID	VWW06-Lagoon									
Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	01/31/12
Chemical Name										
Polychlorinated Biphenyl Congeners (PG/G)										
2-Chlorobiphenyl (1)	2.7 J	3.1 J	1.9 J	2 J	1.9 U	2.2 J	2.8 J	4.4 J	5.8 U	2.1 J
3-Chlorobiphenyl (2)	3.5 J	4.1 J	2.1 J	2.5 J	1.4 J	2 U	1.9 U	1.5 J	6 U	1.2 J
4-Chlorobiphenyl (3)	1.1 J	1.2 J	1.5 J	2 J	1 J	0.89 J	0.91 J	0.86 J	6.2 U	1.6 J
2,2'-Dichlorobiphenyl (4)	9.9 J	8.7 J	4.3 J	10 U	9.7 U	9.7 J	12 J	24	46 U	4.9 J
2,3-Dichlorobiphenyl (5)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	52 U	9.8 U
2,3'-Dichlorobiphenyl (6)	9.8 U	11 J	11 J	7.4 J	9.7 U	7.2 J	8.4 J	20	53 U	7.4 J
2,4-Dichlorobiphenyl (7)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	51 U	9.8 U
2,4'-Dichlorobiphenyl (8)	37	39	37	31	15 J	24	25	60	280 J	32
2,5-Dichlorobiphenyl (9)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	57 U	9.8 U
2,6-Dichlorobiphenyl (10)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	34 U	9.8 U
3,3'-Dichlorobiphenyl (11)	71	72	70	91	47	16 J	25	32	310 J	26
3,5-Dichlorobiphenyl (14)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	46 U	9.8 U
4,4'-Dichlorobiphenyl (15)	10 J	9.1 J	18 J	14 J	8.5 J	9.9 U	9.4 U	9.6 U	52 U	4 J
2,2',3-Trichlorobiphenyl (16)	10 J	11 J	4.2 J	1.4 J	0.97 U	5.9 J	6.9 J	17 J	76 J	8.9 J
2,2',4-Trichlorobiphenyl (17)	28	32	14 J	6.7 J	2.4 J	9.3 J	11 J	26	270 J	25
2,2',6-Trichlorobiphenyl (19)	11 J	11 J	2.3 J	1.6 J	0.97 U	9.8 J	11 J	29	110 J	8 J
2,3,4'-Trichlorobiphenyl (22)	58	63	130	56	27	31	35	80	430 J	37
2,3,5-Trichlorobiphenyl (23)	3.3 J	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	11 U	0.98 U
2,3,6-Trichlorobiphenyl (24)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.83 J	5.5 U	0.98 U
2,3',4-Trichlorobiphenyl (25)	23	26	18 J	17 J	8.3 J	12 J	13 J	29	210 J	14 J
2,3',6-Trichlorobiphenyl (27)	6.7 J	7.5 J	3.9 J	2.4 J	1 J	3.5 J	3.3 J	7.1 J	68 J	5.2 J
2,4',5-Trichlorobiphenyl (31)	220	250	170	200	90	140	160	250	1,900 J	130
2,4',6-Trichlorobiphenyl (32)	71	76	45	44	20	23	26	47	630 J	50
2,3',5'-Trichlorobiphenyl (34)	0.98 U	3.6 J	3.2 J	1.9 J	0.97 U	2.2 J	1.5 J	3.7 J	12 U	3.2 J
3,3',4-Trichlorobiphenyl (35)	2 U	2 U	3.4 J	2.7 J	1.9 U	2 U	1.9 U	1.9 U	12 U	2 U
3,3',5-Trichlorobiphenyl (36)	20	26	7.3 J	11 J	5.9 J	15 J	17 J	28	240 J	13 J
3,4,4'-Trichlorobiphenyl (37)	33	36	34	45	21	3.1 J	3.5 J	6.9 J	270 J	14 J
3,4,5-Trichlorobiphenyl (38)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	12 U	0.98 U
3,4',5-Trichlorobiphenyl (39)	0.98 U	1.6 J	3.5 J	1.6 J	0.97 U	0.99 U	0.94 U	0.96 U	11 U	1.1 J
2,2',3,4-Tetrachlorobiphenyl (41)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	1 U	3 J	56 J	5.4 J
2,2',3,4'-Tetrachlorobiphenyl (42)	78	79	44	47	21	9.5 J	9.5 J	42	780 J	60
2,2',3,5-Tetrachlorobiphenyl (43)	10 J	13 J	5.9 J	3.2 J	0.69 J	0.99 U	0.94 U	0.96 U	140 J	11 J
2,2',3,6-Tetrachlorobiphenyl (45)	26	22	3.2 J	2.7 J	1.2 J	13 J	17 J	34	220 J	18 J
2,2',3,6'-Tetrachlorobiphenyl (46)	10 J	10 J	3.2 J	1 U	0.97 U	3.3 J	3.8 J	9.9 J	120 J	7.7 J
2,2',4,5-Tetrachlorobiphenyl (48)	43	44	21	9.9 J	0.97 U	2.5 J	1.8 J	8.4 J	460 J	41
2,2',4,6'-Tetrachlorobiphenyl (51)	40	41	11 J	5.7 J	2.7 J	8.8 J	7.7 J	20	420 J	31
2,2',5,5'-Tetrachlorobiphenyl (52)	2,400	2,700	780	1,300	450	1,900	2,100	3,100	31,000	1,500
2,2',6,6'-Tetrachlorobiphenyl (54)	2 J	2.2 J	0.95 U	1 U	0.97 U	3.2 J	3.8 J	6 J	4.7 U	1.4 J
2,3,3',4-Tetrachlorobiphenyl (55)	2 U	2 U	1.9 U	2 U	1.9 U	2 U	1.9 U	1.9 U	28 U	10 J
2,3,3',4'-Tetrachlorobiphenyl (56)	280	300	140	210	100	37	39	130	2,400	160
2,3,3',5-Tetrachlorobiphenyl (57)	78	0.99 U	2.4 J	2.9 J	1.2 J	33	31 J	70	1,200 J	2.9 J
2,3,3',5'-Tetrachlorobiphenyl (58)	1.1 U	0.99 U	3.1 J	3.1 J	1.1 J	0.99 U	0.97 U	1.5 U	27 U	2.5 J
2,3,4,4'-Tetrachlorobiphenyl (60)	160	170	210	200	80	160	180	280	1,400 J	82
2,3,4',5-Tetrachlorobiphenyl (63)	53	56	93	61	23	57	62	92	460 J	25
2,3,4',6-Tetrachlorobiphenyl (64)	350	360	150	280	130	170	180	330	3,700	200
2,3',4,4'-Tetrachlorobiphenyl (66)	1,200	1,300	1,100	1,200	460	1,300	1,400	1,700	11,000	580
2,3',4,5-Tetrachlorobiphenyl (67)	29	32	21	22	12 J	13 J	15 J	33	310 J	17 J
2,3',4,5'-Tetrachlorobiphenyl (68)	18 J	19 J	27	18 J	8.8 J	23	22 J	31 J	180 J	10 J
2,3',5,5'-Tetrachlorobiphenyl (72)	29	24	21	25	10 J	28	32	45	320 J	16 J
2,3',5',6-Tetrachlorobiphenyl (73)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	9 U	0.98 U
3,3',4,4'-Tetrachlorobiphenyl (77)	52	53	56	72	26	15	17	34 J	380	24
3,3',4,5-Tetrachlorobiphenyl (78)	1.3 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	1.1 U	1.7 U	30 U	0.98 U
3,3',4,5'-Tetrachlorobiphenyl (79)	71	71	19 J	16 J	7.4 J	19 J	21 J	38	460 J	15 J
3,3',5,5'-Tetrachlorobiphenyl (80)	1 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	1.4 U	25 U	0.98 U
3,4,4',5-Tetrachlorobiphenyl (81)	1.1 U	0.99 U	2.8	4.4	1.8 J	0.99 U	2.8 J	3.4	30 U	2
2,2',3,3',4-Pentachlorobiphenyl (82)	160	170	100	74	32	16 J	15 J	48	2,100	120
2,2',3,3',5-Pentachlorobiphenyl (83)	1.7 U	1.1 U	1.3 U	1.3 U	1 U	1.5 U	1.9 U	2.2 U	52 U	140
2,2',3,3',6-Pentachlorobiphenyl (84)	530	560	110	47	21	97	110	280	6,900	380
2,2',3,4,6'-Pentachlorobiphenyl (89)	14 J	15 J	4.1 J	2.9 J	1.2 U	1.6 U	2.1 U	2.5 U	170 J	14 J
2,2',3,5,5'-Pentachlorobiphenyl (92)	980	1,000	170	290	110	880	990	1,100	14,000	660
2,2',3,5,6'-Pentachlorobiphenyl (94)	8.8 J	9.1 J	6 J	2.6 J	1.1 U	1.6 U	2.1 J	4.2 J	88 J	6.6 J
2,2',3,5',6-Pentachlorobiphenyl (95)	2,500	2,900	400	350	120	780	850	1,700	35,000	1,600
2,2',3,6,6'-Pentachlorobiphenyl (96)	5.8 J	5.7 J	0.95 U	1 U	0.97 U	3.3 J	3.9 J	7.5 J	85 J	4.1 J
2,2',4,4',5-Pentachlorobiphenyl (99)	3,100	3,500	3,700	2,800	1,200	3,800	4,300	3,700	33,000	1,500
2,2',4,5',6-Pentachlorobiphenyl (103)	31	33	6.2 J	7 J	3.6 J	27	29	39	430 J	22
2,2',4,6,6'-Pentachlorobiphenyl (104)	0.98 U	0.57 J	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	3.4 U	0.98 U

Appendix B
Post-removal Supplemental Confirmatory Biota Sampling Data (Jan.-Feb. 2012)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, PR

Station ID	VWW06-Lagoon									
Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	01/31/12
Chemical Name										
2,3,3',4,4'-Pentachlorobiphenyl (105)	1,600	1,800	1,800	2,000	740	2,500	2,800	2,600	16,000	740
2,3,3',4,5-Pentachlorobiphenyl (106)	2 U	2 U	1.9 U	2 U	1.9 U	2 U	1.9 U	2.1 U	50 U	2 U
2,3,3',4,6-Pentachlorobiphenyl (109)	380	400	440	410	150	550	630	570	3,300	180
2,3,3',5,5'-Pentachlorobiphenyl (111)	1.2 U	5.4 J	6.7 J	6.1 J	0.97 U	6.5 J	6.6 J	5.6 J	39 U	2.3 J
2,3,3',5,6-Pentachlorobiphenyl (112)	1.6 U	1.1 U	1.3 U	1.3 U	1 U	1.4 U	1.9 U	2.2 U	51 U	1.3 U
2,3,4,4',5-Pentachlorobiphenyl (114)	120	120	150	120	39	170	200	170	1,300	52
2,3',4,4',5-Pentachlorobiphenyl (118)	5,600	6,400	6,400	6,100	2,400	8,200	9,300	8,200	54,000	2,400
2,3',4,5,5'-Pentachlorobiphenyl (120)	22	24	27	29	11 J	42	50	42	160 J	11 J
2,3',4,5',6-Pentachlorobiphenyl (121)	1.4 J	1.4 J	1 U	1 U	0.97 U	2.7 J	2.4 J	2.1 J	39 U	1 U
2,3,3',4',5'-Pentachlorobiphenyl (122)	61	58	48	48	19 J	1.2 U	1.5 U	1.8 U	41 U	27
2,3',4,4',5'-Pentachlorobiphenyl (123)	64	71	81	63	26	82 J	120 J	96	530	22
3,3',4,4',5-Pentachlorobiphenyl (126)	13 J	8.5 J	9.1 J	17	6	26	20	23	150 J	5.5
3,3',4,5,5'-Pentachlorobiphenyl (127)	7.6 J	8 J	5.3 J	6.7 J	0.97 U	13 J	13 J	8.8 J	41 U	4.1 J
2,2',3,3',4,5'-Hexachlorobiphenyl (130)	320	360	160	230	77	320	380	340	3,800	200
2,2',3,3',4,6-Hexachlorobiphenyl (131)	19 J	20 J	11 J	6.4 J	3.6 J	3.9 J	4.1 J	5.2 J	270 J	11 J
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	920	1,000	140	170	62	120	140	210	12,000	650
2,2',3,3',5,5'-Hexachlorobiphenyl (133)	74	83	46	73	21	63	75	81	870 J	46
2,2',3,3',6,6'-Hexachlorobiphenyl (136)	290	310	12 J	9.9 J	4.7 J	48	56	85	4,800	210
2,2',3,4,4',5-Hexachlorobiphenyl (137)	220	240	190	150	55	240	270	210	2,400	110
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	670	690	190	280	110	580	700	540	8,800	430
2,2',3,4,5,6-Hexachlorobiphenyl (142)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	1.2 U	1.1 U	18 U	0.98 U
2,2',3,4,5',6-Hexachlorobiphenyl (144)	120	130	18 J	31	15 J	76	89	76	1,800 J	84
2,2',3,4,6,6'-Hexachlorobiphenyl (145)	1.1 J	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	11 U	0.98 U
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	650	710	690	730	270	960	1,100	860	6,800	340
2,2',3,4',5,6'-Hexachlorobiphenyl (148)	3.6 J	3.6 J	1.1 J	1.4 J	0.97 U	4.2 J	5.2 J	0.96 U	13 U	2.8 J
2,2',3,4',6,6'-Hexachlorobiphenyl (150)	3.7 J	4 J	0.95 U	1.1 J	0.97 U	1 J	0.94 U	0.96 U	18 J	2.9 J
2,2',3,5,6,6'-Hexachlorobiphenyl (152)	1.9 J	2.1 J	0.72 J	1 U	0.97 U	0.99 U	0.94 U	0.96 U	24 J	0.82 J
2,2',4,4',5,6'-Hexachlorobiphenyl (154)	56	58	59	55	23	61	73	51	600 J	31
2,2',4,4',6,6'-Hexachlorobiphenyl (155)	0.98 U	1 J	0.95 U	1.6 J	0.97 U	1.8 J	2.1 J	0.96 U	7.9 U	0.98 U
2,3,3',4,4',6-Hexachlorobiphenyl (158)	590	680	600	590	230	790	950	670	6,600	300
2,3,3',4,5,5'-Hexachlorobiphenyl (159)	6.3 J	8.5 J	0.96 J	1.9 J	0.97 U	1.2 U	1.6 U	1.9 U	68 J	5.4 J
2,3,3',4,5,6-Hexachlorobiphenyl (160)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	13 U	0.98 U
2,3,3',4,5',6-Hexachlorobiphenyl (161)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	14 U	0.98 U
2,3,3',4',5,5'-Hexachlorobiphenyl (162)	35	40	33	33	11 J	58	69	54	350 J	14 J
2,3,3',4',5',6-Hexachlorobiphenyl (164)	310	340	130	180	70	87 J	140 J	130	3,400	190
2,3,3',5,5',6-Hexachlorobiphenyl (165)	1.2 J	0.74 J	1 J	1.4 J	0.97 U	0.99 U	1.3 J	0.96 U	12 U	0.98 U
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	280	300	290	280	110	500	590	420	2,700	130
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.3 U	1.3 J	0.95 U	1 U	0.97 U	1.3 U	1.7 U	2.1 U	34 U	0.98 U
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	510	590	190	380	150	1,000	1,200	760	4,900	340
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	100	120	71	100	40	190	220	160	820 J	64
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	360	410	61	120	40	49	60	77	3,800	290
2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	15 J	17 J	4.4 J	11 J	4.5 J	20 J	24	13 J	180 J	12 J
2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	25	28	3 J	8 J	2.5 J	5.1 J	5.5 J	6.3 J	340 J	21
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	300	340	110	240	76	280	310	300	2,900	220
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	82	94	40	80	26	56	62	71	850 J	63
2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	100	110	7.8 J	17 J	5.2 J	14 J	16 J	17 J	1,400 J	92
2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	13 J	15 J	13 J	13 J	3.7 J	27	30	14 J	69 J	8.3 J
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	5.2 J	5.1 J	4.1 J	3.3 J	1.5 J	4.7 J	4.9 J	3.1 J	37 J	3 J
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	230	260	200	240	99	450	550	340	2,400	160
2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	1.2 J	0.94 J	0.57 J	0.9 J	0.97 U	0.99 U	1.6 J	0.96 U	6.8 U	0.98 U
2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	31 J	48 J	1.9 U	2 U	6.4 J	39	1.9 U	27 J	22 U	23
2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	6.3 U	0.98 U
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	540	620	450	690	270	730	850	580	4,500	330
2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	3.1 J	3 J	1.5 J	2.7 J	1.9 J	4.5 J	5.1 J	2.4 J	14 J	1.1 J
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	19	20	13	20	7.4	35	43	22 J	150 J	9.8
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	79	82	43	70	28	8.7 J	190	130	840 J	50
2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	24	25	14 J	22	9.2 J	43	50	32	280 J	15 J
2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.96 U	1.2 U	16 U	0.98 U
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	79	86	28	96	43	150	200	110	840 J	66
2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	31	34	9.8 J	28	12 J	65	73	43	310 J	31
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	48	56	32	61	30	75	83	54	470 J	41
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	5.6 J	4.8 J	2.6 J	6.6 J	2.7 J	7.6 J	8.1 J	5.6 J	48 J	3.4 J
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	7.2 J	7.2 J	1.9 U	2 U	1.9 U	1.4 J	2.4 J	1.9 U	68 J	8.3 J
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	17 J	20 J	8.3 J	19 J	9.8 J	24	26	17 J	150 J	15 J
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	36	38	20	45	18 J	37	44	37	320 J	29
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	75	83	34	65	31	160	180	100	730 J	78
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	8.3 U	0.98 U
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	2.8 J	3.7 J	0.95 U	1 J	0.97 U	6.3 J	7.5 J	2.5 J	36 J	3.7 J

Appendix B
Post-removal Supplemental Confirmatory Biota Sampling Data (Jan.-Feb. 2012)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, PR

Station ID	VWW06-Lagoon									
Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112
Sample Date	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	01/31/12	02/01/12	02/01/12	01/31/12
Chemical Name										
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	33	39	9.3 J	27	14 J	61	71	42	450 J	40
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	5.8 J	7 J	2.8 J	6.8 J	4.9 J	10 J	11 J	6.6 J	69 J	5.4 J
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	18 J	19 J	8.8 J	19 J	10 J	24	29	17 J	160 J	17 J
Decachlorobiphenyl (209)	13 J	15 J	6.1 J	16 J	9.8 J	21	23	13 J	130 J	15 J
Congeners (13/12)	20 U	20 U	19 U	20 U	19 U	20 U	19 U	19 U	55 U	20 U
Congeners (21/33)	93	100	57	39 J	15 J	23 J	26 J	60	790 J	88
Congeners (26/29)	48	54	26 J	40	20 J	34 J	39	65	440 J	30 J
Congeners (28/20)	320	350	500	370	160	230	260	460	2,600 J	180
Congeners (30/18)	62	64	23 J	16 J	6.3 J	26 J	28 J	79	570 J	46
Congeners (40/71)	200	210	170	97	48	31 J	29 J	75	1,800 J	160
Congeners (44/47/65)	940	980	700	480	240	420	440	850	11,000	560
Congeners (50/53)	110	110	43	15 J	6.5 J	43	47	96	1,000 J	68
Congeners (59/62/75)	63	64	61	42 J	19 J	52 J	54 J	85	630 J	38
Congeners (61/70/74/76)	2,600	2,800	2,000	2,100	830	2,300	2,400	3,500	26,000	1,300
Congeners (69/49)	870	910	290	390	190	520	560	1,000	10,000	510
Congeners (86/87/97/108/119/125)	2,500	2,700	1,200	920	470	710	820	1,300	33,000	1,600
Congeners (88/91)	470	510	65	160	71	180	190	290	6,000	300
Congeners (93/100)	29	30 J	26 J	19 J	9.5 J	27 J	30 J	35 J	370 J	17 J
Congeners (98/102)	77	82	31 J	16 J	5.4 J	2.2 J	2 U	16 J	930 J	60
Congeners (107/124)	200	220	130	160	55	210	250	240	2,100 J	110
Congeners (110/115)	6,100	6,700	3,600	3,500	1,600	1,200	1,400	2,600	70,000	3,200
Congeners (113/90/101)	5,900	6,600	2,400	3,800	1,400	3,800	4,300	5,800	80,000	3,600
Congeners (117/116/85)	800	860	780	690	270	930	1,100	1,100	7,700	460
Congeners (128/166)	750	840	530	640	270	990	1,200	840	8,600	430
Congeners (134/143)	130	120	35 J	23 J	7 J	14 J	17	27 J	1,800 J	88
Congeners (138/163/129)	5,200	5,600	4,300	5,200	1,900	9,100	11,000	7,800	59,000	2,800
Congeners (139/140)	95	100	84	72	33	100	120	82	1,100 J	54
Congeners (147/149)	2,700	2,900	740	1,400	530	390	450	560	35,000	1,700
Congeners (151/135)	830	900	130	180	69	320	380	400	12,000	610
Congeners (153/168)	4,100	4,600	4,500	4,500	1,700	7,400	8,800	6,400	46,000	2,200
Congeners (156/157)	830	920	870	920	340	1,500	1,700	1,300	8,000	380
Congeners (171/173)	180	210	100	140	62	300	340	200	1,700 J	110
Congeners (180/193)	960	1,100	660	980	390	1,700	2,000	1,400	8,500	580
Congeners (198/199)	160	180	97	210	92	230	250	160	1,200 J	130
Total Dichlorobiphenyls	130	150	140	140	70	57	70	140	590	75
Total Heptachlorobiphenyls	3,600	4,100	2,000	3,100	1,200	5,000	6,000	4,100	34,000	2,400
Total Hexachlorobiphenyls	19,000	21,000	14,000	16,000	6,000	21,000	24,000	19,000	230,000	11,000
Total Monochlorobiphenyls	7.4	8.5	5.5	6.6	2.4	4.1	4.7	6.8	0 U	4.8
Total Nonachlorobiphenyls	57	65	21	53	29	96	110	66	680	63
Total Octachlorobiphenyls	460	510	230	530	240	760	870	530	4,200	400
Total Pentachlorobiphenyls	31,000	34,000	22,000	22,000	8,700	25,000	29,000	33,000	370,000	17,000
Total Tetrachlorobiphenyls	9,800	10,000	6,100	6,500	2,700	7,200	7,700	12,000	110,000	5,400
Total Trichlorobiphenyls	1,000	1,100	1,000	850	380	570	650	1,200	8,700	650
Total Non-Dioxin-Like Congeners	57,000	62,000	35,000	39,000	16,000	48,000	56,000	56,000	660,000	34,000
PCB (total)	65000	72000	45000	49000	19000	62000	71000	69000	750,000	37000
Toxic Equivalents (Total TEQ)	1.6	1.2	1.2	2	0.71	3	2.4	2.7	18	0.66
Total Metals (MG/KG)										
Lead	5.14	4.12	3.55	2.07	2.15	0.097 J	0.055 J	0.057	1.65 J	0.271
Thallium	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Zinc	21.6	20.3	19.3	26.4	26.6	16.9 J	10.8 J	16.1	15.5	13.5
Wet Chemistry (PCT)										
% Solids	35.8	31.2	34.8	35.4	34.4	30.0	28.4	23.4	33.1	22.5
Lipids (%)	0.37	0.41	0.24	0.62	0.46	0.38	0.4	0.8	5.4	0.38

Notes:

J - Estimated

U - Nondetect or not detected at significantly greater than that in an associated blank.

MG/KG - Milligrams per kilogram

PCT - Percent

PG/G - Picograms per gram

Appendix C
SWMU 6 Surface Water and Sediment Background Study

Background Study for Vieques SWMU 6

PREPARED FOR: Julio Vazquez/USEPA
Wilmarie Rivera/PREQB
Richard Henry/USFWS

PREPARED BY: CH2M HILL on behalf of the Navy

DATE: November 21, 2011

Introduction

Background surface water and sediment data associated with the SWMU 6 investigation were collected for metals (total and dissolved for surface water) and selected organics (pesticides/polychlorinated biphenyls [PCBs]). These data are presented in Tables 1A and 1B. An outlier evaluation was performed, resulting in the exclusion of a few of the elevated concentrations for chromium in sediment and antimony, hexavalent chromium (dissolved) and vanadium in surface water. The remaining data were used to calculate 95 percent upper confidence limits of the 95th percentile, known as 95/95 UTLs. These UTLs serve as the background values compared to surface water and sediment concentrations detected at SWMU 6.

Evaluation of Outliers

Outlier analysis was performed for all constituents detected at least once. Per EPA guidance (EPA, 2006), Dixon's Extreme Value test (recommended for sample sizes less than 25) was used. It was applied in such a way that multiple outliers would all be identified as mathematical outliers. With multiple outliers, a given extreme value may be masked by another, slightly lower value and initially be found not to be a mathematical outlier. When testing for multiple outliers, however, both values may actually be outliers. For instance, if the lower of two elevated values was identified as an outlier, both of the values were designated as outliers.

This outlier tests is based on an assumption of normality for those concentrations remaining after the statistical outlier(s) is excluded. Thus, various transformations were considered, based on the Shapiro-Wilk test (a test for normality) to achieve the best adherence to normality with the remaining concentrations (Gilbert, 1987; EPA, 2006). The data were transformed using one of three transformations. These were the square root transformation, the cubic root transformation, and the natural logarithmic transformation. The logarithmic transformation is a standard transformation in environmental applications, while the square root and cubic root transformations offer options that are appropriate for intermediate levels of data skewness.

The mathematical outliers identified via this approach are presented in Table 2. These concentrations were not included in the background data set used to calculate summary

statistics. The transformations used for each outlier analysis are included in Table 2. The concentrations of the outliers relative to the other concentrations are presented in the probability plots shown in Figures 1-5. These five figures are for Sediment-Total Metals, Sediment-Pesticides/PCBs, Surface Water-Total Metals, Surface Water-Dissolved Metals, and Surface Water- Pesticides/PCBs, respectively.

The probability plots show the actual concentrations versus the expected quantiles if the data were normal. The quantiles in these plots are the number of standard deviations from the mean. These graphs help visualize the ascending concentrations so that the most elevated concentrations can be viewed with respect to the lower concentrations. In the probability plots, detected concentrations are plotted as solid circles. Non-detects (NDs) are plotted as open circles. The mathematical outliers are plotted as Xs. As shown in the figures, outliers comprised elevated values for chromium in sediment and antimony, hexavalent chromium (dissolved) and vanadium in surface water.

The calculated outliers were not concentrated in any given sample (each of the four outliers were from a separate sample). It is important to note that the outliers may actually be part of the normal background population of data. Outlier identification was performed by establishing a common, conservative significance value of 0.05 and eliminating any constituent concentration that exceeded this significance value (via the outlier test) from the background UTL calculation. While this process likely eliminates true background "upper tail" concentrations from the background UTL calculations, it does provide a conservative measure to avoid elevating the background UTLs in case outlier concentrations are not representative of background.

Summary Statistics

Using the dataset generated via the outlier evaluations, summary statistics for each detected constituent and depth are presented in Table 3. The statistics comprise the mean, median, standard deviation, minimum RL, maximum RL, minimum detect, maximum detect, number of detects, number of samples, and percent detects for all concentrations retained in the data set, after removal of outliers, and are reported to three significant figures.

These summary statistics include the calculation of 95 percent upper confidence limits of the 95th percentile, known as 95/95 UTLs. These UTLs serve as background values for comparisons to surface water and sediment data for samples collected at SWMU 6. The background threshold values, as 95/95 UTLs, were calculated using either a distributional assumption that appeared most appropriate, or using a nonparametric (distribution free) approach when evidence for a particular distribution is not available. The distribution possibilities included the normal, lognormal, and gamma distributions.

As long as at least 60 percent of the results were detected, the distributions appearing most appropriate via ProUCL's distributional checks were used to calculate the UTL. For such cases, when data include NDs, ProUCL algorithms seek to apply maximum-likelihood-estimate (MLE) or regression on order statistics (ROS) techniques to provide proxy values for the NDs used in the calculation of the UTLs. When a UTL estimated using MLE or ROS techniques is possible within ProUCL's algorithms, that approach was preferred over one using alternate proxy values (e.g., one-half the detection limit). When fewer than 60%

detections were available, the Kaplan Meier approach was used in lieu of establishing specific proxy values for NDs. When all results were detected, but no discernable distribution was available, a nonparametric UTL, based on ranks of the data, was applied.

For ease of use, the final background threshold values are presented alone in Table 4.

Vieques-West
SWMU 6
Surface Water Raw Analytical Results
February 2011

Table 1A
SWMU 6 Background Surface Water Data
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021	VWW06-SW022	VWW06-SW023	
Sample ID	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Sample Date	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name											
Pesticide/Polychlorinated Biphenyls (UG/L)											
4,4'-DDD	0.0054 U	0.0055 U	0.0055 U	0.0054 U	0.048 J	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U
4,4'-DDE	0.0079 U	0.008 U	0.0081 U	0.0079 U	0.067	0.0079 U	0.0078 U	0.0079 U	0.0078 U	0.0079 U	0.0079 U
4,4'-DDT	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.083	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U
Aldrin	0.0033 U	0.0034 U	0.0034 U	0.0033 U	0.0046 NJ	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
alpha-BHC	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
alpha-Chlordane	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.045 J	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Aroclor-1016	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1221	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1232	NA	NA	NA	NA	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.017 U
Aroclor-1242	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1248	NA	NA	NA	NA	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Aroclor-1254	NA	NA	NA	NA	0.0098 U	0.0099 U	0.0099 U	0.0098 U	0.0099 U	0.01 U	0.01 U
Aroclor-1260	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
beta-BHC	0.0025 U	0.0025 U	0.0026 U	0.0025 U	0.025 J	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
delta-BHC	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.012 J	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Dieldrin	0.0056 U	0.0057 U	0.0057 U	0.0056 U	0.047 J	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Endosulfan I	0.009 U	0.009 U	0.0091 U	0.0089 U	0.049 J	0.0089 U	0.0089 U	0.009 U	0.0089 U	0.009 U	0.009 U
Endosulfan II	0.0033 U	0.0034 U	0.0034 U	0.0033 U	0.04 J	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
Endosulfan sulfate	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.026 J	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U
Endrin	0.0038 U	0.0038 U	0.0038 U	0.0037 U	0.053	0.0037 U	0.0037 U	0.0038 U	0.0037 U	0.0038 U	0.0038 U
Endrin aldehyde	0.0031 U	0.0032 U	0.0032 U	0.0031 U	0.0053 J	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U
Endrin ketone	0.012 U	0.013 U	0.013 U	0.012 U	0.029 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
gamma-BHC (Lindane)	0.005 U	0.005 U	0.0051 U	0.005 U	0.005 U	0.005 U	0.0049 U	0.005 U	0.0049 U	0.005 U	0.005 U
gamma-Chlordane	0.005 U	0.005 U	0.0051 U	0.005 U	0.026 J	0.005 U	0.0049 U	0.005 U	0.0049 U	0.005 U	0.005 U
Heptachlor	0.0082 U	0.0083 U	0.0084 U	0.0082 U	0.0074 J	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Heptachlor epoxide	0.0029 U	0.0029 U	0.003 U	0.0029 U	0.038 J	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U
Methoxychlor	0.0038 U	0.0038 U	0.0038 U	0.0037 U	0.061	0.0037 U	0.0037 U	0.0038 U	0.0037 U	0.0038 U	0.0038 U
Toxaphene	0.38 U	0.38 U	0.38 U	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U	0.37 U	0.38 U	0.38 U
Total Metals (UG/L)											
Aluminum	186 U	186 U	428 J	282 J	1,240 R	2,030 R	800 R	490 R	602 R	640 R	586 R
Antimony	66 U	20 U	20 U	20 U	36.8 J	20 U	20 U	20 U	20 U	72.7 J	20 U
Arsenic	50 U	66.2 U	66.2 U	66.2 U	50 U	50 U	50 U	66.2 U	66.2 U	50 U	50 U
Barium	33.4 J	29.6 J	33.9 J	31.7 J	9.84 J	13 J	10.6 J	8.47 J	10.5 J	10.3 J	9.64 J
Beryllium	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Cadmium	20 U	14.4 U	9.35 J	11.4 J	14.4 U	8.76 J	9.14 J	9.35 J	11 J	9.5 J	9.58 J
Calcium	519,000	503,000	539,000	512,000	421,000	424,000	410,000	427,000	427,000	425,000	425,000
Chromium	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U
Chromium (hexavalent)	53	44 J	43 J	97 J	21	18 J	29 J	8 J	12 J	29 J	47 J
Cobalt	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U
Copper	50 U	98.6 J	149 J	108 J	46.2 J	45 J	40.7 J	40.7 J	44 J	42 J	37.3 J
Iron	110 U	110 U	201 J	110 U	635 J	1,660 J	331 J	110 UJ	176 J	314 J	227 J
Lead	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium	1,570,000	1,550,000	1,620,000	1,520,000	1,310,000	1,320,000	1,290,000	1,310,000	1,300,000	1,300,000	1,320,000
Manganese	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U
Mercury	0.0514 J	0.0516 J	0.074 UJ	0.074 UJ	0.074 U	0.074 U	0.0426 J	0.074 U	0.074 U	0.074 UJ	0.0405 J
Nickel	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U
Potassium	533,000	514,000	533,000	521,000	433,000	437,000	421,000	435,000	436,000	429,000	430,000
Selenium	113	102	99.6	50.7 J	84.2 J	89.6 J	54.9 J	103	49.3 J	82 U	82 U
Silver	5 U	5 U	10.4 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Sodium	13,600,000	13,600,000	13,800,000	13,200,000	11,000,000	11,200,000	11,100,000	11,000,000	11,000,000	10,800,000	10,800,000
Thallium	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U
Vanadium	8.8 U	8.8 U	8.8 U	8.8 U	5.9 J	7.77 J	4.98 J	8.8 U	8.8 U	8.8 U	5.46 J
Zinc	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U

Vieques-West
SWMU 6
Surface Water Raw Analytical Results
February 2011

Table 1A
SWMU 6 Background Surface Water Data
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021	VWW06-SW022	VWW06-SW023	
Sample ID	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Sample Date	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name											
Dissolved Metals (UG/L)											
Aluminum, Dissolved	186 U	186 U	252 J	200 J	186 U	186 U	186 U	186 U	186 U	186 U	186 U
Antimony, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic, Dissolved	50 U	66.2 U	66.2 U	66.2 U	50 U	50 U	50 U	66.2 U	66.2 U	66.2 U	50 U
Barium, Dissolved	26.4 J	26.6 J	28 J	28.4 J	8.65 J	10.2 J	9.74 J	7.76 J	9.8 J	10.6 J	7.41 J
Beryllium, Dissolved	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Cadmium, Dissolved	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U
Calcium, Dissolved	535,000	556,000	553,000	548,000	414,000 R	434,000 R	430,000 R	434,000 R	422,000 R	438,000 R	415,000 R
Chromium, Dissolved	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U
Chromium (hexavalent), Dissolved	16 J	19 J	38 J	20 J	15 J	7 J	16 J	7 UJ	4 J	16 J	16 J
Cobalt, Dissolved	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U
Copper, Dissolved	50 U	54 U	54 U	54 U	50 U	50 U	50 U	54 U	54 U	54 U	26 J
Iron, Dissolved	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U
Lead, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	11.9 J
Magnesium, Dissolved	1,640,000 J	1,680,000 J	1,690,000 J	1,690,000 J	1,310,000 R	1,340,000 R	1,360,000 R	1,350,000 R	1,310,000 R	1,350,000 R	1,270,000 R
Manganese, Dissolved	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U
Mercury, Dissolved	0.0621 J	0.0551 J	0.0469 J	0.053 J	0.074 U	0.074 U	0.074 U	0.074 U	0.0454 J	0.074 UJ	0.074 UJ
Nickel, Dissolved	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U
Potassium, Dissolved	533,000	550,000	552,000	539,000	428,000 R	447,000 R	443,000 R	448,000 R	431,000 R	443,000 R	419,000 R
Selenium, Dissolved	100 J	114 J	82 U	82 U	68.8 J	105	72.8 J	104	96.8	121	65.9 J
Silver, Dissolved	5 U	5 U	10.4 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Sodium, Dissolved	13,900,000	14,500,000	15,600,000	13,700,000	10,900,000	10,900,000	11,300,000	11,100,000	10,900,000	11,400,000	10,500,000
Thallium, Dissolved	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U
Vanadium, Dissolved	8.8 U	8.8 U	8.8 U	5.37 J	8.8 U	8.8 U	4.94 J	4.5 J	5.82 J	5.78 J	8.8 U
Zinc, Dissolved	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U

Notes:
J - Analyte present, value may or may not be accurate or precise
NA - Not analyzed

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

R - Unreliable Result
U - Not detected or not detected at significantly greater than that in an associated blank.

UJ - Analyte not detected, quantitation limit may be inaccurate

UG/L - Micrograms per liter

Table 1B
SWMU 6 Background Sediment Data
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022	VWW06-SD023	
Sample ID	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211	VWW06-SD023-0211	VWW06-SD023P-0211
Sample Date	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Chemical Name											
Pesticide/Polychlorinated Biphenyls (UG/KG)											
4,4'-DDD	3.4 UJ	2.2 UJ	3.1 UJ	3.8 UJ	3.9 UJ	3.9 UJ	4.1 UJ	4.2 UJ	4.5 UJ	3.6 UJ	3.5 UJ
4,4'-DDE	1.3 J	1.1 UJ	1.6 UJ	2 UJ	2.1 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.4 UJ	1.9 UJ	1.8 UJ
4,4'-DDT	2.6 UJ	1.6 UJ	2.3 UJ	2.8 UJ	2.9 UJ	2.9 UJ	3 UJ	3.1 UJ	3.4 UJ	2.6 UJ	2.6 UJ
Aldrin	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1 UJ	1 UJ
alpha-BHC	5 UJ	3.2 UJ	4.6 UJ	5.5 UJ	5.8 UJ	5.8 UJ	6 UJ	6.2 UJ	6.6 UJ	5.2 UJ	5.1 UJ
alpha-Chlordane	1.1 UJ	0.68 UJ	0.98 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ	1.1 UJ	1.1 UJ
Aroclor-1016	87 UJ	55 UJ	80 UJ	96 UJ	61 UJ	61 UJ	63 UJ	65 UJ	70 UJ	55 UJ	54 UJ
Aroclor-1221	80 UJ	51 UJ	73 UJ	89 UJ	56 UJ	56 UJ	58 UJ	60 UJ	64 UJ	51 UJ	50 UJ
Aroclor-1232	100 UJ	64 UJ	92 UJ	110 UJ	70 UJ	70 UJ	72 UJ	75 UJ	81 UJ	64 UJ	62 UJ
Aroclor-1242	74 UJ	47 UJ	67 UJ	81 UJ	51 UJ	51 UJ	53 UJ	55 UJ	59 UJ	46 UJ	45 UJ
Aroclor-1248	74 UJ	47 UJ	67 UJ	81 UJ	51 UJ	51 UJ	53 UJ	55 UJ	59 UJ	46 UJ	45 UJ
Aroclor-1254	64 UJ	40 UJ	58 UJ	70 UJ	44 UJ	44 UJ	46 UJ	47 UJ	51 UJ	40 UJ	39 UJ
Aroclor-1260	41 UJ	26 UJ	37 UJ	45 UJ	28 UJ	28 UJ	29 UJ	30 UJ	33 UJ	26 UJ	25 UJ
beta-BHC	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1 UJ	1 UJ
delta-BHC	1.9 UJ	1.2 UJ	1.7 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.3 UJ	2.5 UJ	2 UJ	1.9 UJ
Dieldrin	1.1 UJ	0.68 UJ	0.98 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ	1.1 UJ	1.1 UJ
Endosulfan I	1.5 UJ	0.93 UJ	1.3 UJ	1.6 UJ	1.7 UJ	1.7 UJ	1.8 UJ	1.8 UJ	2 UJ	1.5 UJ	1.5 UJ
Endosulfan II	1.9 UJ	1.2 UJ	1.8 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.3 UJ	2.4 UJ	2.6 UJ	2 UJ	2 UJ
Endosulfan sulfate	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.4 UJ	1.4 UJ
Endrin	1.7 UJ	1.1 UJ	1.6 UJ	1.9 UJ	2 UJ	2 UJ	2.1 UJ	2.1 UJ	2.3 UJ	1.8 UJ	1.8 UJ
Endrin aldehyde	2.4 UJ	1.5 UJ	2.2 UJ	2.7 UJ	2.8 UJ	2.8 UJ	2.9 UJ	3 UJ	3.2 UJ	2.5 UJ	2.4 UJ
Endrin ketone	1.4 UJ	0.89 UJ	1.3 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.7 UJ	1.7 UJ	1.9 UJ	1.5 UJ	1.4 UJ
gamma-BHC (Lindane)	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.4 UJ	1.4 UJ
gamma-Chlordane	1.1 UJ	0.72 UJ	1 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ	1.4 UJ	1.5 UJ	1.2 UJ	1.2 UJ
Heptachlor	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.4 UJ	1.4 UJ
Heptachlor epoxide	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1 UJ	1 UJ
Methoxychlor	1.8 U	1.1 UJ	1.6 UJ	2 UJ	2.1 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.4 UJ	1.9 UJ	1.8 UJ
Toxaphene	170 UJ	110 UJ	150 UJ	180 UJ	190 UJ	190 UJ	200 UJ	200 UJ	220 UJ	170 UJ	170 UJ
Total Metals (MG/KG)											
Aluminum	8,470 J	9,890 J	7,980 J	10,600 J	27,000 J	24,500 J	29,200 J	16,200 J	14,000 J	16,900 J	16,600 J
Antimony	1.33 UJ	0.89 UJ	1.35 UJ	1.51 UJ	1.01 UJ	1.17 UJ	1.03 UJ	1.02 UJ	1.09 UJ	0.974 UJ	0.835 UJ
Arsenic	2.5 UJ	2 J	1.4 UJ	2.1 J	5.9 J	5.5 J	2.6 J	6 J	6.2 J	3.1 J	2.8 J
Barium	8.21 J	7.11 J	9.6 J	11.3 J	14.8 J	14 J	19.8 J	11.6 J	9.56 J	12 J	11.3 J
Beryllium	0.89 UJ	0.593 UJ	0.902 UJ	1 UJ	0.648 J	0.478 J	0.612 J	0.678 UJ	0.38 J	0.395 J	0.339 J
Cadmium	0.175 J	0.185 UJ	0.282 UJ	0.314 UJ	0.211 UJ	0.244 UJ	0.214 UJ	0.212 UJ	0.227 UJ	0.203 UJ	0.174 UJ
Calcium	30,900 J	14,000 J	17,600 J	11,400 J	6,260 J	8,510 J	4,750 J	53,000 J	14,200 J	25,400 J	25,400 J
Chromium	10.9 J	20 J	10.3 J	6.7 J	14.9 J	13.7 J	15 J	14.1 J	14.8 J	15 J	15.1 J
Chromium (hexavalent)	24.8 J	150 J	30.5 J	101 J	33.9 J	36.8 J	34.1 J	24.6 J	9.34 J	30.4 J	36.3 J
Cobalt	3.81 J	3.94 J	3.3 J	4.47 J	8.48 J	7.33 J	7.01 J	5.03 J	5.08 J	5.26 J	5.18 J
Copper	29.7 J	23.4 J	37.1 J	28.5 J	44.6 J	42.4 J	47.6 J	32.1 J	32.5 J	39.6 J	37.4 J
Iron	10,400 J	9,300 J	14,400 J	8,870 J	35,300 J	34,000 J	29,400 J	19,600 J	20,000 J	23,500 J	22,800 J
Lead	3.94 J	4.64 J	6.38 J	7.08 J	12.6 J	11.3 J	12.2 J	6.18 J	6.06 J	6.94 J	6.35 J
Magnesium	13,000 J	9,920 J	11,000 J	15,800 J	9,660 J	9,420 J	8,880 J	9,550 J	10,300 J	9,390 J	8,700 J
Manganese	159 J	115 J	196 J	63 J	359 J	341 J	334 J	174 J	191 J	250 J	248 J
Mercury	0.0988 J	0.0669 J	0.131 J	0.0771 J	0.0985 J	0.0858 J	0.0707 J	0.043 J	0.0611 J	0.0754 J	0.0676 J
Nickel	7.15 J	7.3 J	5.8 J	5.16 J	8.43 J	7.88 J	8.6 J	7.1 J	6.79 J	7.44 J	7.15 J
Potassium	3,720 J	2,750 J	3,260 J	4,190 J	5,360 J	4,860 J	5,290 J	3,860 J	3,750 J	3,910 J	3,490 J
Selenium	2.5 UJ	1.1 UJ	1.4 UJ	2.1 UJ	1.6 UJ	1.4 J	1.9 J	4.4 J	2.6 J	1.6 J	1.5 J
Silver	0.89 UJ	0.593 UJ	0.902 UJ	1 UJ	0.674 UJ	0.78 UJ	0.684 UJ	0.678 UJ	0.726 UJ	0.649 UJ	0.557 UJ
Sodium	62,000 J	39,400 J	56,700 J	74,700 J	36,300 J	37,000 J	30,800 J	37,700 J	40,600 J	32,200 J	28,800 J
Thallium	1.89 UJ	1.26 UJ	1.92 UJ	2.14 UJ	1.43 UJ	1.7 J	1.45 UJ	1.44 UJ	1.54 UJ	1.24 J	0.707 J
Vanadium	29.4 J	42.4 J	20.7 J	58.6 J	54.7 J	46.8 J	56.3 J	44.5 J	43.7 J	33.6 J	35.2 J
Zinc	40.4 J	42.2 J	31.9 J	34.9 J	76 J	70.9 J	67.8 J	43.1 J	43.4 J	51.4 J	49.6 J
Wet Chemistry											
pH (ph)	7.22	7.17	7.26	7.07	7.3	7.25	7.05	7.52	7.3	7.23	6.96
Redox (MV) (mv)	-1.58E+02	-1.48E+02	-1.52E+02	-1.56E+02	-1.21E+02	-1.25E+02	-1.54E+02	-1.19E+02	-1.05E+02	-1.54E+02	-1.51E+02

Notes:
J - Analyte present, value may or may not be accurate or precise
NA - Not analyzed
U - Not detected or not detected at significantly greater than that in an associated blank.
UJ - Analyte not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
MV - Millivolts
PH - pH units
UG/KG - Micrograms per kilogram

Table 2
Mathematical Outliers from SWMU 6 Background Data (Excluded from Summary Statistics)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Matrix	Constituent	Sample ID	Transformation [1]	Concentration (mg/kg)	Qualifier
SD	Chromium	VWW06-SD015-0211	None	20	J
SW	Antimony	VWW06-SW023-0211	None	72.7	J
SW	Chromium (hexavalent), Dissolved	VWW06-SW016-0211	None	38	J
SW	Vanadium	VWW06-SW019-0211	Logarithm	7.77	J

Notes:

[1] Transformation used to provide closest adherence to normality by the remaining concentrations (aside from the elevated results

Table 3
SWMU 6 Background Summary Statistics
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Matrix	Chemical Group	Constituent	Calculated UTL	UTL Basis	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detect	Maximum Detect	Minimum RL	Maximum RL	Sample ID of Maximum Detected Concentration	Excluded Outliers
SD	Metal	Aluminum	35000	Normal UTL	10	10	100	mg/kg	7980	29200	NN	NN	VWW06-SD020-0211	
SD	Metal	Arsenic	28.8	Gamma UTL	8	10	80	mg/kg	2	6.2	1.4	2.5	VWW06-SD022-0211	
SD	Metal	Barium	20.5	Normal UTL	10	10	100	mg/kg	7.11	19.8	NA	NA	VWW06-SD020-0211	
SD	Metal	Beryllium	0.718	Kaplan Meier UTL	5	10	50	mg/kg	0.38	0.648	0.593	1	VWW06-SD018-0211	
SD	Metal	Cadmium	NA	Only a Single Detect	1	10	10	mg/kg	0.175	0.175	0.174	0.314	VWW06-SD014-0211	
SD	Metal	Calcium	66700	Gamma UTL	10	10	100	mg/kg	4750	53000	NN	NN	VWW06-SD021-0211	
SD	Metal	Chromium	15.1	Nonparametric UTL	9	9	100	mg/kg	6.7	15.1	NN	NN	VWW06-SD023P-0211	20
SD	Metal	Chromium (hexavalent)	219	Lognormal UTL	10	10	100	mg/kg	9.34	150	NN	NN	VWW06-SD015-0211	
SD	Metal	Cobalt	9.37	Normal UTL	10	10	100	mg/kg	3.3	8.48	NN	NN	VWW06-SD018-0211	
SD	Metal	Copper	54.1	Normal UTL	10	10	100	mg/kg	23.4	47.6	NN	NN	VWW06-SD020-0211	
SD	Metal	Iron	43900	Normal UTL	10	10	100	mg/kg	8870	35300	NN	NN	VWW06-SD018-0211	
SD	Metal	Lead	15.1	Normal UTL	10	10	100	mg/kg	3.94	12.6	NN	NN	VWW06-SD018-0211	
SD	Metal	Magnesium	17500	Gamma UTL	10	10	100	mg/kg	8880	15800	NN	NN	VWW06-SD017-0211	
SD	Metal	Manganese	455	Normal UTL	10	10	100	mg/kg	63	359	NN	NN	VWW06-SD018-0211	
SD	Metal	Mercury	0.138	Normal UTL	10	10	100	mg/kg	0.043	0.131	NN	NN	VWW06-SD016-0211	
SD	Metal	Nickel	9.68	Normal UTL	10	10	100	mg/kg	5.16	8.6	NN	NN	VWW06-SD020-0211	
SD	Metal	Potassium	6090	Normal UTL	10	10	100	mg/kg	2750	5360	NN	NN	VWW06-SD018-0211	
SD	Metal	Selenium	4.34	Kaplan Meier UTL	5	10	50	mg/kg	1.4	4.4	1.1	2.5	VWW06-SD021-0211	
SD	Metal	Sodium	96400	Gamma UTL	10	10	100	mg/kg	30800	74700	NN	NN	VWW06-SD017-0211	
SD	Metal	Thallium	1.69	Kaplan Meier UTL	2	10	20	mg/kg	1.24	1.7	1.26	2.14	VWW06-SD019-0211	
SD	Metal	Vanadium	71.7	Normal UTL	10	10	100	mg/kg	20.7	58.6	NN	NN	VWW06-SD017-0211	
SD	Metal	Zinc	87.3	Normal UTL	10	10	100	mg/kg	31.9	76	NN	NN	VWW06-SD018-0211	
SD	Pesticide/PCB	4,4'-DDE	NA	Only a Single Detect	1	10	10	ug/kg	1.3	1.3	1.1	2.4	VWW06-SD014-0211	
SW	Dissolved Metal	Aluminum, Dissolved	242	Kaplan Meier UTL	2	10	20	ug/L	200	252	186	186	VWW06-SW016-0211	
SW	Dissolved Metal	Barium, Dissolved	28.4	Nonparametric UTL	10	10	100	ug/L	7.76	28.4	NN	NN	VWW06-SW017-0211	
SW	Dissolved Metal	Calcium, Dissolved	NA	Only Four Results	4	4	100	ug/L	535000	556000	NN	NN	VWW06-SW015-0211	
SW	Dissolved Metal	Chromium (hexavalent), Dissolved	31.5	Normal UTL MLE	8	9	89	ug/L	4	20	7	7	VWW06-SW017-0211	38
SW	Dissolved Metal	Copper, Dissolved	NA	Only a Single Detect	1	10	10	ug/L	26	26	50	54	VWW06-SW023P-0211	
SW	Dissolved Metal	Lead, Dissolved	NA	Only a Single Detect	1	10	10	ug/L	11.9	11.9	20	20	VWW06-SW023P-0211	
SW	Dissolved Metal	Magnesium, Dissolved	NA	Only Four Results	4	4	100	ug/L	164000	169000	NN	NN	VWW06-SW016-0211	
SW	Dissolved Metal	Mercury, Dissolved	0.0667	Kaplan Meier UTL	5	10	50	ug/L	0.0454	0.0621	0.074	0.074	VWW06-SW014-0211	
SW	Dissolved Metal	Potassium, Dissolved	NA	Only Four Results	4	4	100	ug/L	533000	552000	NN	NN	VWW06-SW016-0211	
SW	Dissolved Metal	Selenium, Dissolved	126	Normal UTL	8	10	80	ug/L	68.8	121	82	82	VWW06-SW023-0211	
SW	Dissolved Metal	Sodium, Dissolved	156000	Nonparametric UTL	10	10	100	ug/L	109000	156000	NN	NN	VWW06-SW016-0211	
SW	Dissolved Metal	Vanadium, Dissolved	6.25	Kaplan Meier UTL	5	10	50	ug/L	4.5	5.82	8.8	8.8	VWW06-SW022-0211	
SW	Metal	Aluminum	NA	Only Four Results	2	4	50	ug/L	282	428	186	186	VWW06-SW016-0211	
SW	Metal	Antimony	36.8	Only a Single Detect	1	9	11	ug/L	36.8	36.8	20	66	VWW06-SW018-0211	72.7
SW	Metal	Barium	33.9	Nonparametric UTL	10	10	100	ug/L	8.47	33.9	NN	NN	VWW06-SW016-0211	
SW	Metal	Cadmium	12.5	Normal UTL	7	10	70	ug/L	8.76	11.4	14.4	20	VWW06-SW017-0211	
SW	Metal	Calcium	539000	Nonparametric UTL	10	10	100	ug/L	410000	539000	NN	NN	VWW06-SW016-0211	
SW	Metal	Chromium (hexavalent)	99	Normal UTL	10	10	100	ug/L	8	97	NN	NN	VWW06-SW017-0211	
SW	Metal	Copper	152	Kaplan Meier UTL	9	10	90	ug/L	40.7	149	50	50	VWW06-SW016-0211	
SW	Metal	Iron	5270	Gamma UTL	6	10	60	ug/L	176	1660	110	110	VWW06-SW019-0211	
SW	Metal	Magnesium	162000	Nonparametric UTL	10	10	100	ug/L	129000	162000	NN	NN	VWW06-SW016-0211	
SW	Metal	Mercury	0.0548	Kaplan Meier UTL	4	10	40	ug/L	0.0405	0.0516	0.074	0.074	VWW06-SW015-0211	
SW	Metal	Potassium	533000	Nonparametric UTL	10	10	100	ug/L	421000	533000	NN	NN	VWW06-SW014-0211	
SW	Metal	Selenium	126	Normal UTL	9	10	90	ug/L	49.3	113	82	82	VWW06-SW014-0211	
SW	Metal	Sodium	138000	Nonparametric UTL	10	10	100	ug/L	108000	138000	NN	NN	VWW06-SW016-0211	
SW	Metal	Vanadium	6.48	Kaplan Meier UTL	3	9	33	ug/L	4.98	5.9	8.8	8.8	VWW06-SW018-0211	7.77
SW	Pesticide/PCB	4,4'-DDD	NA	Only a Single Detect	1	10	10	ug/L	0.048	0.048	0.0054	0.0055	VWW06-SW018-0211	
SW	Pesticide/PCB	4,4'-DDE	NA	Only a Single Detect	1	10	10	ug/L	0.067	0.067	0.0078	0.0081	VWW06-SW018-0211	
SW	Pesticide/PCB	4,4'-DDT	NA	Only a Single Detect	1	10	10	ug/L	0.083	0.083	0.0023	0.0023	VWW06-SW018-0211	
SW	Pesticide/PCB	Aldrin	NA	Only a Single Detect	1	10	10	ug/L	0.0046	0.0046	0.0033	0.0034	VWW06-SW018-0211	
SW	Pesticide/PCB	alpha-Chlordane	NA	Only a Single Detect	1	10	10	ug/L	0.045	0.045	0.0062	0.0064	VWW06-SW018-0211	
SW	Pesticide/PCB	beta-BHC	NA	Only a Single Detect	1	10	10	ug/L	0.025	0.025	0.0025	0.0026	VWW06-SW018-0211	
SW	Pesticide/PCB	delta-BHC	NA	Only a Single Detect	1	10	10	ug/L	0.012	0.012	0.0062	0.0064	VWW06-SW018-0211	
SW	Pesticide/PCB	Dieldrin	NA	Only a Single Detect	1	10	10	ug/L	0.047	0.047	0.0056	0.0057	VWW06-SW018-0211	
SW	Pesticide/PCB	Endosulfan I	NA	Only a Single Detect	1	10	10	ug/L	0.049	0.049	0.0089	0.0091	VWW06-SW018-0211	
SW	Pesticide/PCB	Endosulfan II	NA	Only a Single Detect	1	10	10	ug/L	0.04	0.04	0.0033	0.0034	VWW06-SW018-0211	
SW	Pesticide/PCB	Endosulfan sulfate	NA	Only a Single Detect	1	10	10	ug/L	0.026	0.026	0.0021	0.0021	VWW06-SW018-0211	
SW	Pesticide/PCB	Endrin	NA	Only a Single Detect	1	10	10	ug/L	0.053	0.053	0.0037	0.0038	VWW06-SW018-0211	
SW	Pesticide/PCB	Endrin aldehyde	NA	Only a Single Detect	1	10	10	ug/L	0.0053	0.0053	0.0031	0.0032	VWW06-SW018-0211	
SW	Pesticide/PCB	Endrin ketone	NA	Only a Single Detect	1	10	10	ug/L	0.029	0.029	0.012	0.013	VWW06-SW018-0211	
SW	Pesticide/PCB	gamma-Chlordane	NA	Only a Single Detect	1	10	10	ug/L	0.026	0.026	0.0049	0.0051	VWW06-SW018-0211	
SW	Pesticide/PCB	Heptachlor	NA	Only a Single Detect	1	10	10	ug/L	0.0074	0.0074	0.0082	0.0084	VWW06-SW018-0211	
SW	Pesticide/PCB	Heptachlor epoxide	NA	Only a Single Detect	1	10	10	ug/L	0.038	0.038	0.0029	0.003	VWW06-SW018-0211	
SW	Pesticide/PCB	Methoxychlor	NA	Only a Single Detec	1	10	10	ug/L	0.061	0.061	0.0037	0.0038	VWW06-SW018-0211	

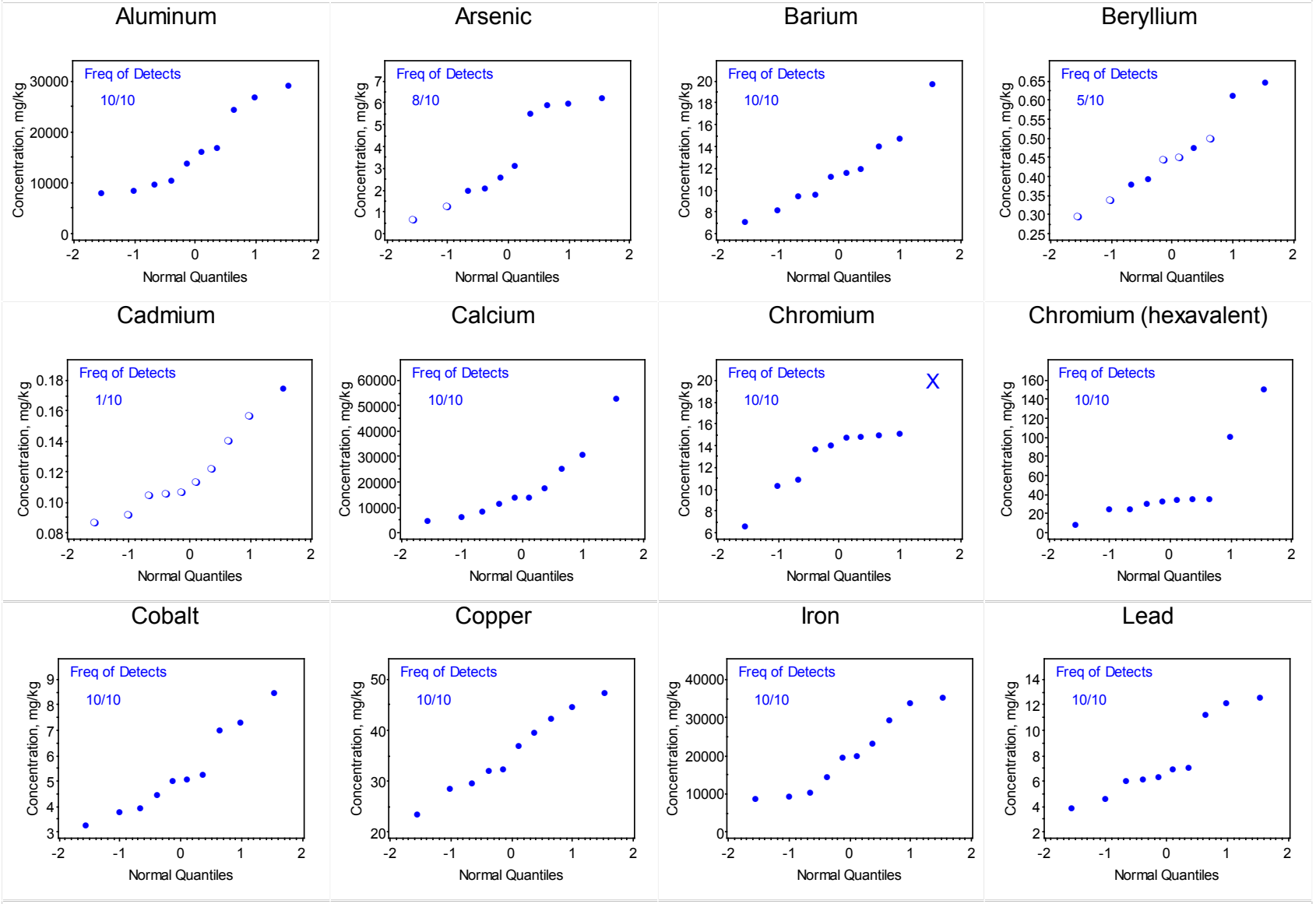
Notes:
All SD concentrations in mg/kg. All SW concentrations in ug/L
NA = Not applicable; no detections or too few observations
RL = reporting limit
NN = not needed; all results were detects

Table 4
Calculated UTLs from SWMU 6 Background Data
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Matrix	Chemical Group	Constituent	Background Threshold Value	
SD	Metal	Aluminum	35000	
SD	Metal	Arsenic	28.8	
SD	Metal	Barium	20.5	
SD	Metal	Beryllium	0.718	
SD	Metal	Cadmium	0.175	*
SD	Metal	Calcium	66700	
SD	Metal	Chromium	15.1	
SD	Metal	Chromium (hexavalent)	219	
SD	Metal	Cobalt	9.37	
SD	Metal	Copper	54.1	
SD	Metal	Iron	43900	
SD	Metal	Lead	15.1	
SD	Metal	Magnesium	17500	
SD	Metal	Manganese	455	
SD	Metal	Mercury	0.138	
SD	Metal	Nickel	9.68	
SD	Metal	Potassium	6090	
SD	Metal	Selenium	4.34	
SD	Metal	Sodium	96400	
SD	Metal	Thallium	1.69	
SD	Metal	Vanadium	71.7	
SD	Metal	Zinc	87.3	
SD	Pesticide/PCB	4,4'-DDE	1.3	*
SW	Dissolved Metal	Aluminum, Dissolved	242	
SW	Dissolved Metal	Barium, Dissolved	28.4	
SW	Dissolved Metal	Calcium, Dissolved	556000	*
SW	Dissolved Metal	Chromium (hexavalent), Dissolved	31.5	
SW	Dissolved Metal	Copper, Dissolved	26	*
SW	Dissolved Metal	Lead, Dissolved	11.9	*
SW	Dissolved Metal	Magnesium, Dissolved	169000	*
SW	Dissolved Metal	Mercury, Dissolved	0.0667	
SW	Dissolved Metal	Potassium, Dissolved	552000	*
SW	Dissolved Metal	Selenium, Dissolved	126	
SW	Dissolved Metal	Sodium, Dissolved	156000	
SW	Dissolved Metal	Vanadium, Dissolved	6.25	
SW	Metal	Aluminum	428	*
SW	Metal	Antimony	36.8	
SW	Metal	Barium	33.9	
SW	Metal	Cadmium	12.5	
SW	Metal	Calcium	539000	
SW	Metal	Chromium (hexavalent)	99	
SW	Metal	Copper	152	
SW	Metal	Iron	5270	
SW	Metal	Magnesium	162000	
SW	Metal	Mercury	0.0548	
SW	Metal	Potassium	533000	
SW	Metal	Selenium	126	
SW	Metal	Sodium	138000	
SW	Metal	Vanadium	6.48	
SW	Pesticide/PCB	4,4'-DDD	0.048	*
SW	Pesticide/PCB	4,4'-DDE	0.067	*
SW	Pesticide/PCB	4,4'-DDT	0.083	*
SW	Pesticide/PCB	Aldrin	0.0046	*
SW	Pesticide/PCB	alpha-Chlordane	0.045	*
SW	Pesticide/PCB	beta-BHC	0.025	*
SW	Pesticide/PCB	delta-BHC	0.012	*
SW	Pesticide/PCB	Dieldrin	0.047	*
SW	Pesticide/PCB	Endosulfan I	0.049	*
SW	Pesticide/PCB	Endosulfan II	0.04	*
SW	Pesticide/PCB	Endosulfan sulfate	0.026	*
SW	Pesticide/PCB	Endrin	0.053	*
SW	Pesticide/PCB	Endrin aldehyde	0.0053	*
SW	Pesticide/PCB	Endrin ketone	0.029	*
SW	Pesticide/PCB	gamma-Chlordane	0.026	*
SW	Pesticide/PCB	Heptachlor	0.0074	*
SW	Pesticide/PCB	Heptachlor epoxide	0.038	*
SW	Pesticide/PCB	Methoxychlor	0.061	*

* Most background threshold values are calculated UTLs. Those asterisked do not have a calculated UTL and are instead assigned the maximum detected value.

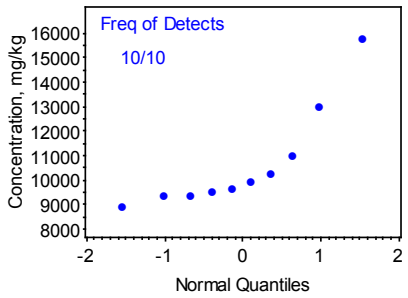
Figure 1: Probability Plots for Total Metals in Sediment



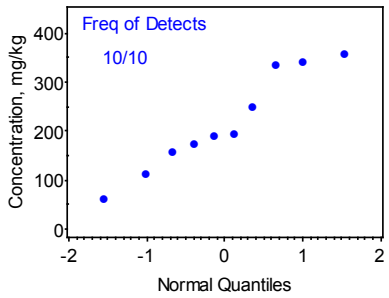
Open Symbol Represents 1/2 DL Proxy for Nondetects; Solid Symbol Represents Detects; X Represents Mathematical Outlier

Figure 1: Probability Plots for Total Metals in Sediment

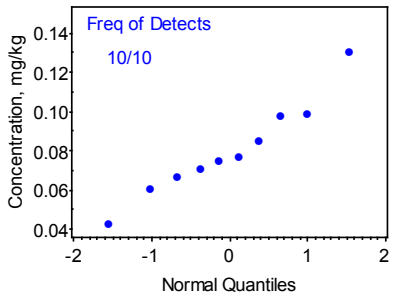
Magnesium



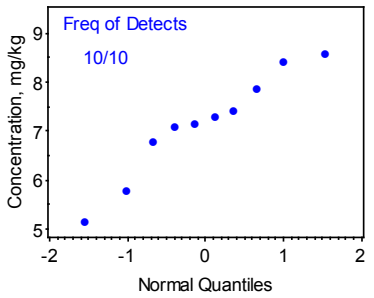
Manganese



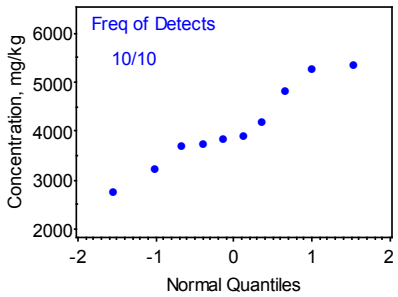
Mercury



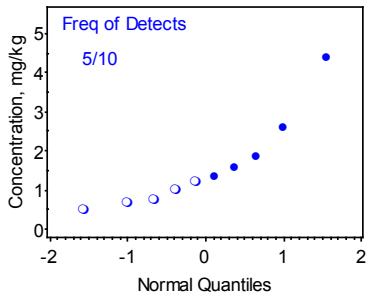
Nickel



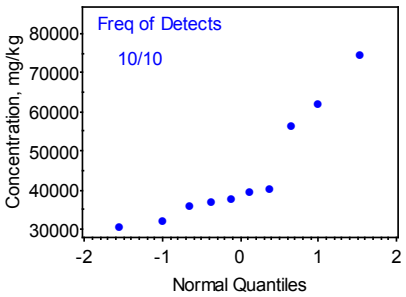
Potassium



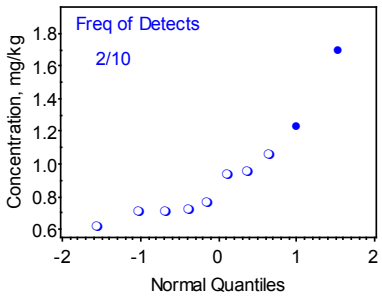
Selenium



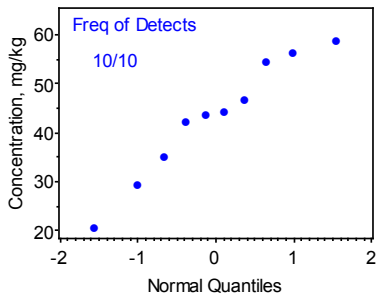
Sodium



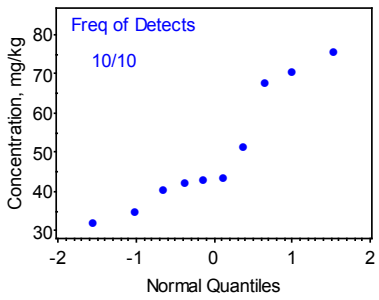
Thallium



Vanadium

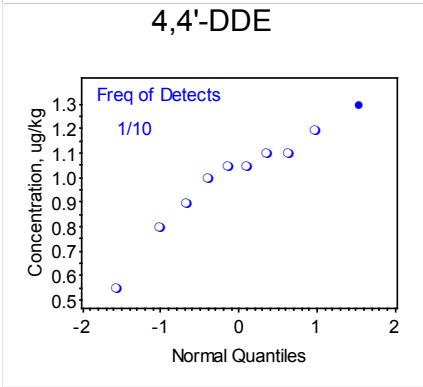


Zinc



Open Symbol Represents 1/2 DL Proxy for Nondetects; Solid Symbol Represents Detects; X Represents Mathematical Outlier

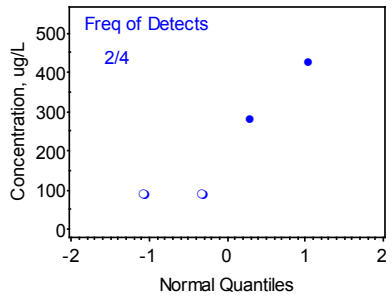
Figure 2: Probability Plots for Pesticides-PCBs in Sediment



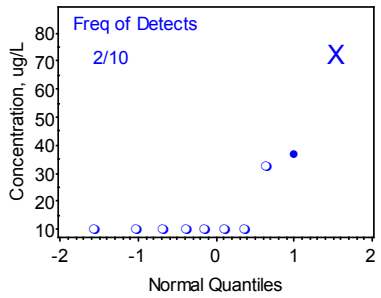
Open Symbol Represents 1/2 DL Proxy for Nondetects; Solid Symbol Represents Detects; X Represents Mathematical Outlier

Figure 3: Probability Plots for Total Metals in Surface Water

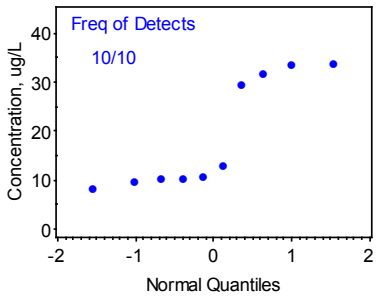
Aluminum



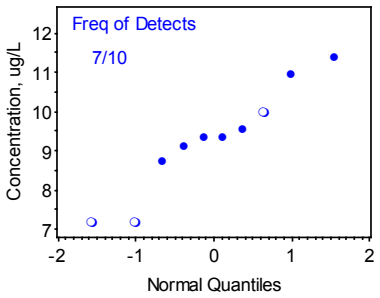
Antimony



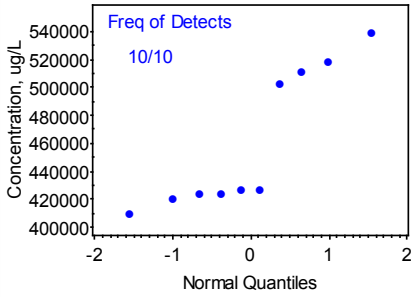
Barium



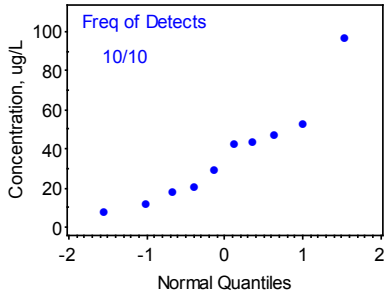
Cadmium



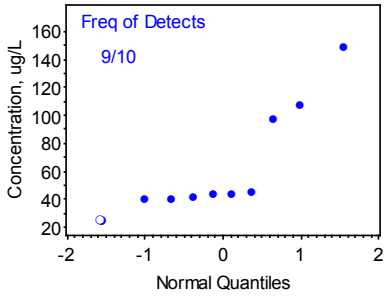
Calcium



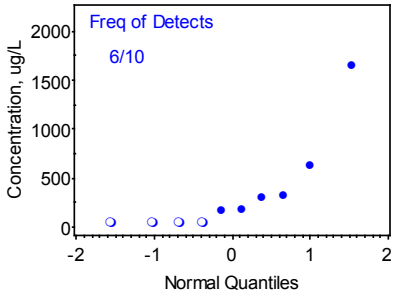
Chromium (hexavalent)



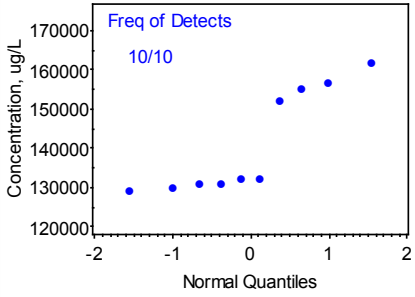
Copper



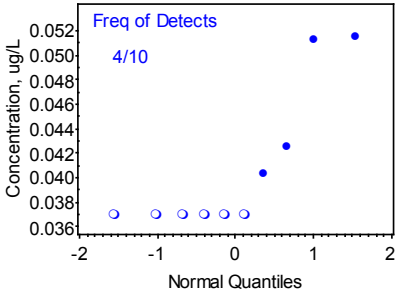
Iron



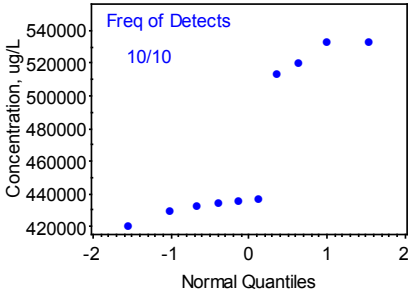
Magnesium



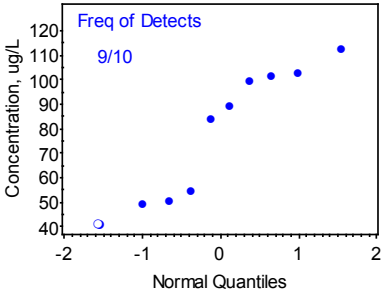
Mercury



Potassium

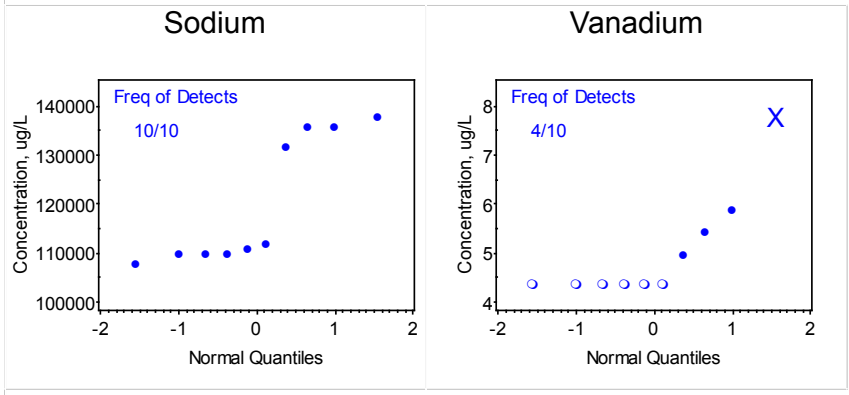


Selenium



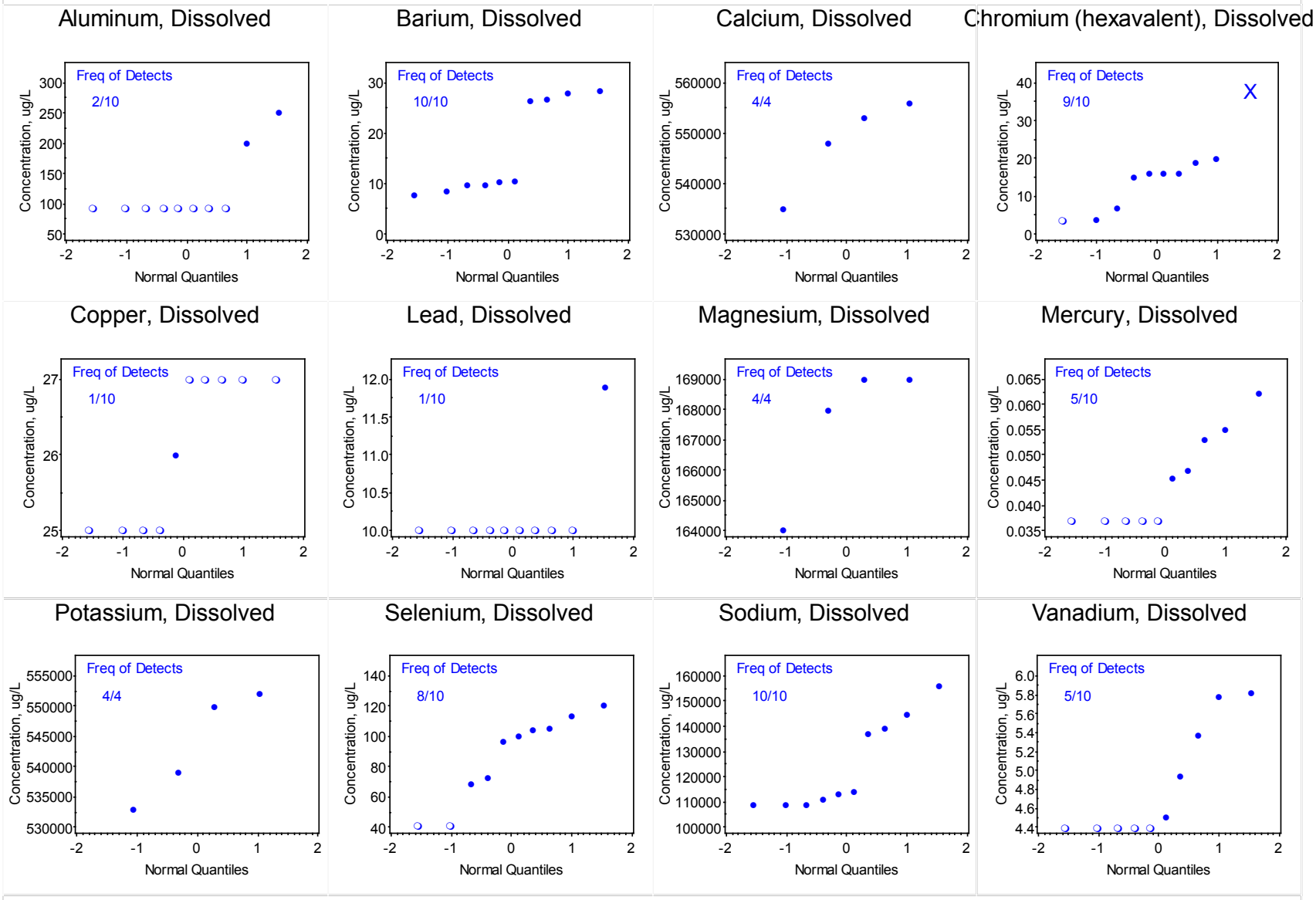
Open Symbol Represents 1/2 DL Proxy for Nondetects; Solid Symbol Represents Detects; X Represents Mathematical Outlier

Figure 3: Probability Plots for Total Metals in Surface Water



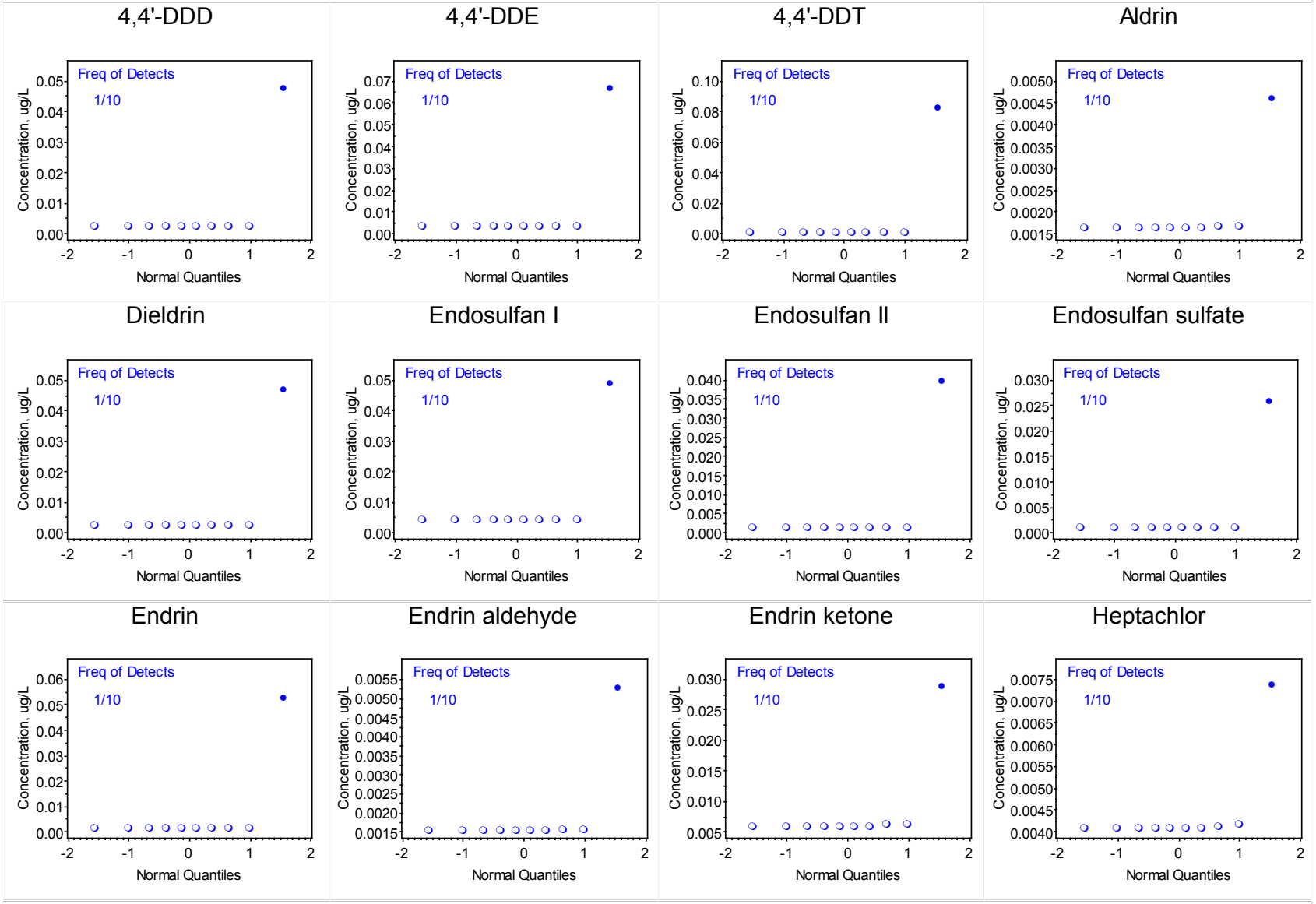
Open Symbol Represents 1/2 DL Proxy for Nondetects; Solid Symbol Represents Detects; X Represents Mathematical Outlier

Figure 4: Probability Plots for Dissolved Metals in Surface Water



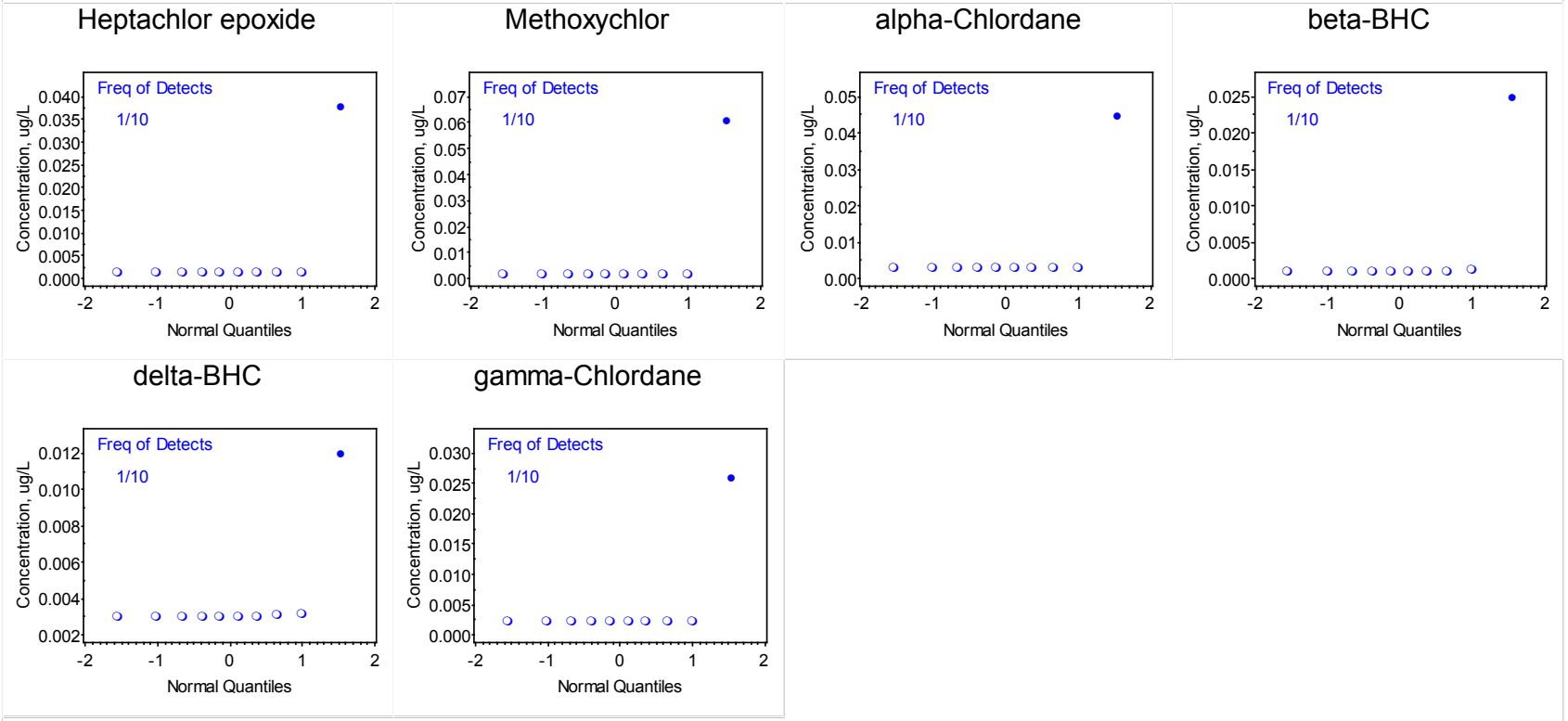
Open Symbol Represents 1/2 DL Proxy for Nondetects; Solid Symbol Represents Detects; X Represents Mathematical Outlier

Figure 5: Probability Plots for Pesticides-PCBs in Surface Water

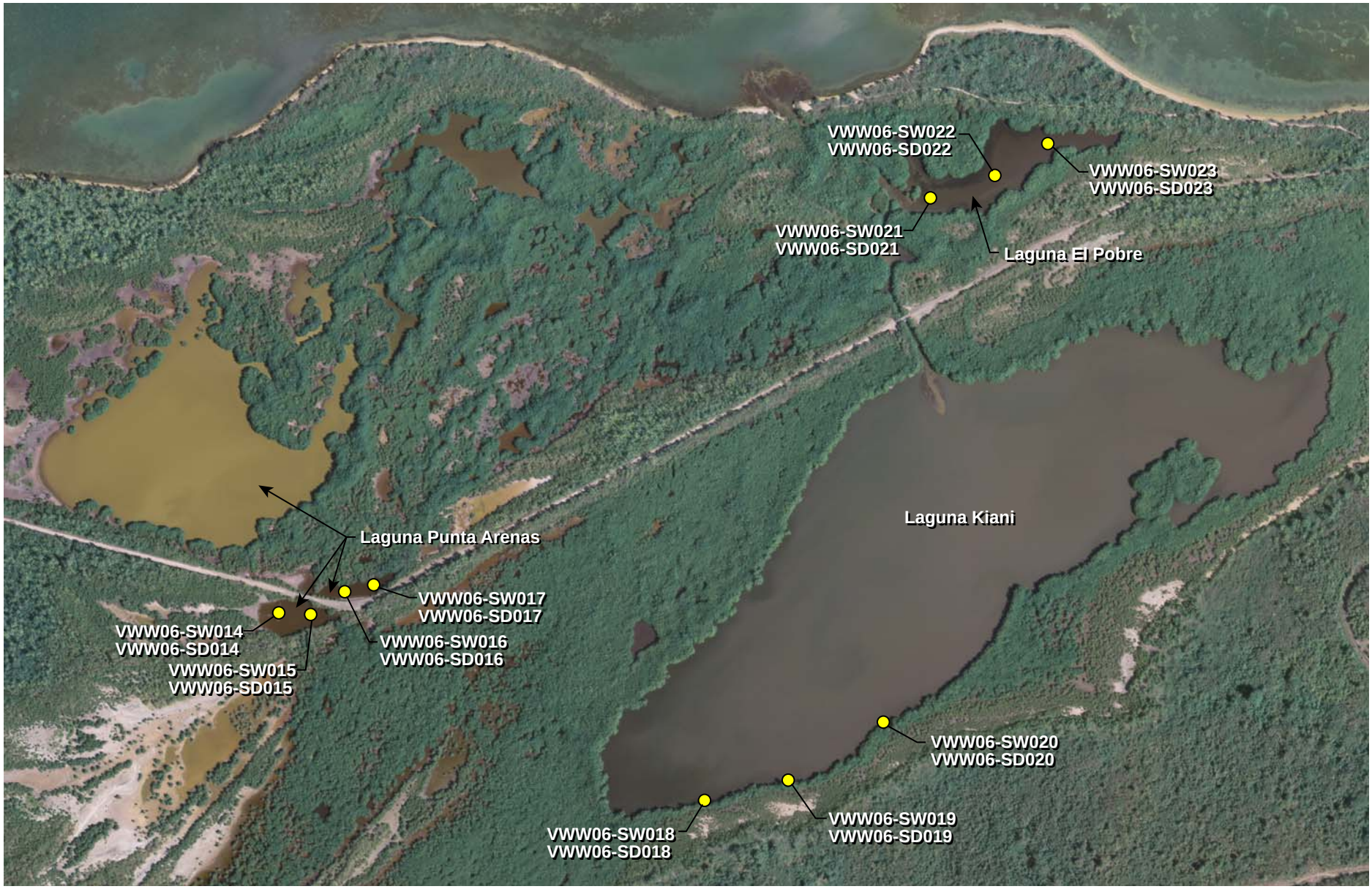


Open Symbol Represents 1/2 DL Proxy for Nondetects; Solid Symbol Represents Detects; X Represents Mathematical Outlier

Figure 5: Probability Plots for Pesticides-PCBs in Surface Water



Open Symbol Represents 1/2 DL Proxy for Nondetects; Solid Symbol Represents Detects; X Represents Mathematical Outlier



North

0 300 600 Feet

LEGEND

- Background surface water and sediment sampling location

FIGURE 6
Background Sampling Locations
SWMU 6 Post-Removal Supplemental Confirmatory Sampling and Analysis Plan
Vieques, Puerto Rico

CH2MHILL

Appendix D
Data Quality Evaluation and Data Validation Reports

1.0 Data Quality Assessment for Vieques SWMU 6

This data quality evaluation assesses the effect of the overall analytical process on the "availability" of the analytical data. "Availability" in this context refers to whether results can be used by the project team based on their analytical soundness. If a result is analytically sound, it is available for use for evaluating the potential releases, nature and extent of contamination, and estimating potentially associated human health and ecological risks. However, a particular result or group of results may not be "usable" for these purposes if other conditions apply. For example, if there were a hypothetical site where a TCE spill had occurred and the TCE data for many or all of the samples were rejected, the data may not be usable for making site-specific determinations even if all the non-TCE data were analytically sound and available for use by the project team. In order to avoid confusion of terms, this data quality evaluation differentiates the "availability" of results from "usability" of results. "Available" results are analytically sound and available for use by the project team to make decisions, even if they are not usable for a particular purpose.

The three major categories of data evaluation are laboratory performance, field collection performance (i.e. blank contamination), and matrix interferences. Evaluation of laboratory performance is a check for compliance with the method requirements; in other words, a check of whether the laboratory analyzed the samples within the limits of the analytical method. Additionally, a third-party validator (DataQual Environmental Services, LLC) conducted a review of the laboratory data to assess whether the analytical methods were within required control limits at the time of analysis. Evaluation of potential matrix interferences involves the review of several areas of results, including surrogate spike recoveries, matrix spike recoveries, and duplicate sample results. Evaluation of field collection performance, such as blank contamination and field duplicates, involves the review field QC and the determination of their effect on the sample results.

The data evaluation and validation is a multi-tiered approach. The process begins with an internal laboratory review, continues with a review by a third-party data validator, and ends with an overall review by the Navy contractor project chemistry team. The process provides a medium for essential communication between the laboratory, validator, and project team, and allows for data quality to be thoroughly evaluated.

This document presents the results of the data quality evaluation performed on the data set corresponding to Vieques SWMU 6 [site] sediment (SD), surface soil (SS), surface water (SW), and tissue (TI) [matrices], and February 3 through February 8, 2011 and January 31 through February 1, 2012 (date ranges). Analytes were grouped into the following analysis groups:

- AVSSEM (Acid Volatile Sulfide and Simultaneously-Extractable Metals via EPA 600_R-02-011)
- FMETAL (field-filtered metals via SW-846 6010B, 6020, 7196A, and/or 7470A)
- GRAINSIZE (grain size via ASTM D422)
- METAL (metals via EPA 1638 or SW-846 6010B, 6020, 7196A, 7470A, and/or 7471A)
- PCBCONG (PCB Congeners via EPA 1668A using QA/QC limits from EPA 1668C)
- PEST/PCB (Pesticides and PCBs via SW-846 8081A and/or 8082)
- SVOA (Semivolatiles via SW-846 8270C_SIM)
- VOA (Volatiles via SW-846 8260B)
- WCHEM (Wet Chemistry or Miscellaneous including EPA 160.3, EPA 350.1, SW-846 9031, SW-846 9045, SW-846 9060, and/or ASTM D1498)

For purposes of this data quality evaluation, three SS samples were grouped with the SD samples and are hereafter referred to as part of the SD matrix.

1.0.1 Laboratory Internal Quality Control Review

Prior to releasing the analytical data, the laboratories (Spectrum-Warwick and Spectrum-Tampa for SD, SS, and SW samples and TestAmerica-West Sacramento and Brooks Rand Labs for TI samples) reviewed both the sample

and QC data to verify sample identity, instrument calibration, LOQs, dilution factors, numerical computations, accuracy of transcriptions, and chemical interpretations. In addition, the QC data were tabulated and the results reviewed to ascertain whether they were within the contract-required or laboratory-defined limits for accuracy and precision. Any non-conforming data were discussed in the data package cover letter and case narrative. The case narrative was then reviewed by the data validator and incorporated into the data validation report. If necessary, the exceedances were verified and qualifiers were applied based on this information.

1.0.2 Data Validation

All SW and SD data were subject to the verification and validation procedures described in Final Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Solid Waste Management Unit 6 (CH2M HILL, December, 2010) UFP-SAP Worksheets #34-36. All TI data were subject to the verification and validation procedures described in Final Addendum Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Solid Waste Management Unit 6 (CH2M HILL, December, 2011) UFP-SAP Addendum Worksheets #34-36.

A third-party data validator reviewed all definitive data packages using the validation criteria outlined in these documents. For the most part, these Worksheets reference the appropriate Region II SOP if such an SOP exists for that analysis method. If a Region II SOP does not exist for the analysis method, then the data are validated against the limits in the UFP-SAP. Guidance and qualifiers are taken from related Region II SOPs or National Functional Guidelines. The following protocol was used for validation:

- For VOA via SW-846 8260B:
  - "Validating Volatile Organic Compounds by SW-846 Method 8260B (SOP HW-24 Rev. 2)" (August, 2008)
- For SVOA via SW-846 8260C_SIM:
  - “Validating Semivolatile Organic Compounds by SW-846 Method 8270 (SOP HW-22 Rev. 4)" (August, 2008)
- For PEST/PCB via SW-846 8081A:
  - “Data Validation SOP of Organochlorine Pesticides by Gas Chromatography SW-846 Method 8081B (SOP HW-44 Rev. 1)" (October, 2006)
- For PEST/PCB via SW-846 8082:
  - "Data Validation SOP of Organic Analysis of PCBs by Gas Chromatography SW-846 Method 8082A (SOP HW-45 Rev. 1)"; (October, 2006)
- For METAL or FMETAL via SW-846 6010B, 6020, 7196A, 7470A, 7471A, or EPA 1638:
  - UFP-SAP QA/QC criteria referencing analytical methods and laboratory SOPs
  - Qualifiers from “Validation of Metals for the Contract Laboratory Program (CLP) based on SOW ILM05.3 (SOP HW-2)” (September, 2006)
  - Guidance from “USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review” (EPA, October, 2004) as needed
- For PCBCONG via 1668A:
  - “Data Validation SOP of Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by HRGC/HRMS (SOP HW-46 Rev. 1)” (August, 2009)
  - UFP-SAP Addendum limits for accuracy/precision

Although not subject to third-party data validation, screening data (AVSSEM, GRAINSIZE, and WCHEM) data are still subject to the verification and validation procedures outlined in Worksheets #34-36. There is a laboratory qualifier and, if needed, a final qualifier to supersede the laboratory qualifier for the purpose of excluding results, consistency with Region II qualifier definitions, etc.

As stated above, the data validation process was separate from the laboratory’s internal review. The process was specifically focused on the effects of the laboratory’s performance and sample matrix on the analytical results. Areas of review consisted of holding time compliance, surrogate recovery accuracy, matrix spiked sample precision and accuracy, blank contamination, initial and continuing calibration accuracy and precision, laboratory control sample accuracy, internal standard response and retention time accuracy, instrument tune criteria accuracy, and duplicate sample precision (laboratory and field duplicates).

Redundant results are most-often due to concentrations exceeding the calibration range or QC results outside of control limits. When multiple analyses were performed, the "best result" was selected for purposes of this data quality evaluation. Among multiple valid and/or invalid results, the "best result" is:

1. The non-rejected result
2. The result from the appropriate concentration range (dilution factor)
3. The detect when one or more result is detected and one or more result is nondetect
4. The greater of detects, and
5. The lesser of nondetects (U-Values).

Qualification of data is not an unusual occurrence. To define a laboratory QC exceedance and when a laboratory QC exceedance occurs, the laboratory refers to its in-house SOPs. The SOPs are based on DOD requirements, the requested analytical method, and accumulated laboratory experience. When a laboratory QC exceedance occurs, the situation may be acceptable or it may require further action by the laboratory, such as application of a laboratory qualifier or re-extraction and/or reanalysis of the sample. The data validator uses a separate set of QC criteria, based on guidance from the EPA region that applies to the samples. A laboratory QC exceedance may not constitute a data validation exceedance and a data validation exceedance may not constitute a laboratory QC exceedance. Data validation criteria exceedances may result in the qualification of or rejection of data, as deemed appropriate by the data validator.

The data validator examines each data point and determines any effects that QC exceedances have had. Most often, these effects dictate that the result or limit of detection (LOD) should be considered estimated, but is still available for use. The J-qualification, UJ-qualification, and U-qualification of results are common occurrences and have no adverse effect on the availability of that result to the project team for making decisions. J-qualified results are available, at the reported result, for use as detects as long as they are considered "estimated" by the project team. Human health risk assessment guidance suggests that these qualifiers "indicate uncertainty in the reported concentration of the chemical, but not in its assigned identity. Therefore, these data can be used just as positive data with no qualifiers or codes." In addition, risk assessment guidance (EPA, 1989) suggests that one should use "J-qualified concentrations the same way as positive data that do not have this qualifier". U-qualified and UJ-qualified results are available, at the reported LOD or level, for use as nondetects as long as they are considered "nondetect," "not detected at significantly greater than that in an associated blank" or "nondetect, estimated LOD," as appropriate. In extreme cases, a result is rejected and deemed to be unusable. "Unusable" in this instance is defined as a result that is not analytically sound and is not generally considered available for use by the project team.

In large data sets, rejected results are often inconsequential because there are sufficient non-rejected data available to the project team. If there are enough non-rejected data or the project team is able to infer results from adjacent sampling locations or there is other site-specific information that can provide additional lines of evidence, it may not be necessary to know the concentrations of some rejected constituents. It may also not be necessary to prove a constituent's absence if there are sufficient additional lines of evidence.

1.0.3 Primary Data Validation Qualifiers

The following data validation qualifiers were applied to one or more analytical results:

- **U** - Not detected. Sample was analyzed for this parameter, but it was not detected at greater than the reported LOD. The data validator may also apply this qualifier to indicate that a concentration was not detected at significantly greater than that in an associated blank. Thus, this qualifier does not necessarily indicate a quality control exceedance.
- **UJ** – Not detected, LOD estimated. Sample was analyzed for this parameter, but it was not detected above the reported LOD. The LOD for this parameter is estimated due to a quality control exceedance.
- **J** - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample. Often, a J-qualifier is applied simply because the

result was less than the limit of quantitation and thus does not necessarily indicate a quality control exceedance.

- **NJ** - Qualitative identification questionable due to poor resolution. The parameter was presumptively identified and the associated numerical value is the approximate concentration of the parameter in the sample.
- **R** - Rejected. The result was rejected because quality control limits were exceeded. It may or may not have been detected by the laboratory. The presence or absence of the parameter cannot be verified and the result generally is not usable as detected or not detected.
- **[none] -** Detected. Qualification was not warranted.

1.0.4 Impact of Data Quality on Project Data Quality Objectives and Data Usability

The laboratories analyzed the samples in accordance with the respective analytical methods. The data packages were reviewed by a data validator taking guidance from USEPA Region II Validation procedures.

The laboratory utilized various qualifiers to represent “below reporting limit,” “nondetect,” and “detected.” Any other extraneous laboratory qualifiers were superseded by data validation qualifiers. The data validator utilized J-qualifiers, NJ-qualifiers, UJ-qualifiers, U-qualifiers, and R-qualifiers to represent “estimated,” “presumptively present at approximate quantity”, “nondetect, estimated LOD,” “nondetect or not detected at significantly greater than that in an associated blank,” and “rejected,” respectively. The only time the data validator changed a result’s detect status was when B-, J-, JB-, JP-, and JQB-qualifiers were changed to U- or UJ-qualifiers (detect to nondetect) as a result of blank contamination. There were also 35 instances where R-qualifiers were applied to detected data and one instance where an R-qualifier was applied to nondetect data as a result of serial dilution exceedances.

The J-, NJ-, and UJ-qualifiers indicate that some results are estimated. These qualifiers indicate that data are available for use as detects, detects, and nondetects, respectively. These qualifiers do not necessarily indicate a problem that adversely affects the availability of data. For example, J-qualifiers are often applied simply because results are below the quantitation limit.

Region II data validation guidance mandates the use of J- and UJ-qualifiers when QA/QC exceedances dictate their necessity. This is distinctly different from other EPA regions, such as Region I and Region III. In Region I, a data validator may use J+ and J--qualifiers to indicate that data are biased high or biased low, respectively. In Region III, a data validator may use K- and L-qualifiers to indicate that data are biased high or biased low, respectively. In Region III, a data validator may use UL-qualifiers to indicate that quantitation limits are biased low and may use B-qualifiers to indicate when results may be attributable to blank contamination. In Region II, if the direction of bias is known, it is not implied by the J- or UJ-qualifier. In Region II, if a result is attributable to blank contamination, it is U-qualified and is no longer distinguishable from results that are simply nondetect. The U-qualified value is elevated to the LOD if necessary. This supports the practice that J-qualified results, while estimated, are available for use as detects at their qualified concentration and U- and UJ-qualifiers are available for use as nondetects at their qualified LOD or level. In general, J-, UJ-, and U-qualified results are available for use as qualified for evaluating potential releases, the nature and extent of contamination, and estimating potentially associated human health and ecological risks.

It is a common occurrence for achieved LODs to be greater than SLs or for LODs to be elevated above what was expected or requested. In many cases, SLs are simply unreasonably low or the laboratory was forced, by the analytical method or sample matrices, to raise limits for various reasons. In the instance where nondetect LODs are greater than SLs, the results are available for use as nondetects, but their use adds uncertainty to the conclusions drawn. There are a variety of typical and potentially unavoidable reasons why the quantitation limits of nondetect results may exceed SLs:

- If an SL is unreasonably low, current instrumentation technology may not be able to achieve a LOD less than the SL.

- The laboratory-specific limits may have been established at a time when the SL was higher (less stringent) or not present, but the reporting is being done using new (more stringent) criteria. Published screening levels, such as EPA Regional Screening Levels, change periodically as toxicity values are updated.
- If a target compound or analyte is present at an elevated level, the laboratory will dilute the entire sample in order to report that concentration within the instrument's linear calibration range. It may not be possible to analyze the sample at a lesser dilution if the target compound's high concentration is likely to damage or saturate the instrument. The high concentration of a non-target compound or analyte may also necessitate initial dilution for the same reason.
- If matrix effects mask low concentrations, the laboratory may be forced to elevate their limits to demonstrate the fact that low concentrations cannot be detected.
- If matrix effects are particularly strong, the laboratory may be forced to analyze the sample at an initial dilution in an attempt to dilute the matrix effects.
- If historical concentrations warrant, the laboratory detects an odor or the field team designates a sample as "expected high concentration," the laboratory may pre-screen the sample and initially dilute it.
- If the sample appearance indicates possible high concentrations, the laboratory may be forced to analyze the sample at a concentration range different from what is requested. For example, if a sample is designated as "groundwater," but is actually an emulsion or sludge, the laboratory may be forced to analyze the sample using the "medium" instead of the "low" or "SIM" concentration range.
- If the field team cannot provide the full sample volume, the laboratory may be forced to dilute the sample by adding water until the minimum volume is achieved.
- If a soil or sediment sample is characterized by high percent moisture, the reporting limits will be elevated such that the concentrations and quantitation limits are reported on a dry-weight basis.

1.0.5 Comparison of Nondetects to Screening Levels

When evaluating the data and making decisions, the project team compares detected sample results to SLs in order to determine exceedances. For this project, the SLs are as follows:

- SD samples are compared to Adjusted Residential Soil EPA Regional Screening Levels (RSLs) (May, 2012) and marine sediment ecological screening values (ESVs). SS samples are compared to soil ESVs instead of marine sediment ESVs.
- SW samples are compared to Adjusted tap water RSLs (May, 2012) and marine surface water ESVs.
- TI samples are compared to human health risk assessment screening levels based on RSLs.

Nondetect results are also compared to SLs, typically during a risk assessment or exceedance screening, by comparing one-half the LOD to the SL. However, this is only done when the same constituent was detected in another sample of the same matrix at the same site. The assumption is that, if the constituent is present in a given sample of a particular matrix at a site, then it may also be present at low concentrations (less than the LOD) in a nondetect sample of the same matrix from the same site. However, when a constituent was not detected in any samples of a particular matrix at a site, then it is considered not present at the site in that matrix. In this instance, it is important to compare the nondetect results to the SL. If the nondetect results (LODs) are not low enough when compared to the SL, then it may be possible that the constituent is present in a sample at greater than the SL but not detected or reported by the laboratory instrumentation. This situation is a common occurrence and is not cause for alarm. There are various typical reasons why this occurs and is expected. Please refer to section 1.0.4, above. Then, refer to Table 1 for sediment, surface water, and tissue matrices. For the purpose of performing this comparison, the minimum of applicable SLs for each matrix (as defined above) is considered to be the SL for each combination of matrix, analysis group, and analyte. It should be noted, however, that not all screening level sets are of equal importance. One row (combination of matrix, analysis group, and analyte) was

generated if there was at least one instance where a nondetect U-Value (LOD or detected result U-qualified due to blank contamination) exceeded a SL.

The minimum and maximum U-Values are further presented in Table 1. The minimum U-Value is generally understood as the lowest LOD that the instrumentation can practically report considering the conditions at the site. The maximum U-Value is then generally understood as the LOD adjusted for the worst conditions (i.e. greatest dilution factors, matrix interference, and percent moisture). Because there is not a large spread between the minimum and maximum U-Values, it is therefore concluded that the site conditions did not have a significant impact on the analysis for this data set. There are 4,253 nondetect (U- or UJ-qualified) data points in this data set. Of these, 1,278 nondetect data points exceeded the SL. In some cases, the maximum U-Value exceeded the SL but the minimum U-Value did not. These are instances where the LOD is usually low enough, but conditions necessitated elevating the LOD in one or more samples. In the other (remaining) cases, the minimum U-Value exceeded the SL. These are instances where the concentration range is not low enough to practically report an LOD at less than the SL. In these instances where the LOD > SL, however, the instrumentation may still report a result, if the analyte is detected in a sample at greater than the SL, if the DL is less than the SL.

Therefore, when a U-Value exceeds a SL, it is worthwhile to consider the DL. Note that DLs, as reported by the laboratory and as presented in Table 1, are “Adjusted DLs” in that they are adjusted for dilution factors, matrix interference, etc. This is synonymous with the adjustment of nondetect results (U-Values or LODs), and also detected results. The DL is the level at which the laboratory is likely to detect and report a constituent, if present in the sample, at greater than background noise. These are theoretical “lower-levels of detection”. The laboratory will report (J-qualified as applicable) any detections at greater than the DL. The minimum and maximum DLs are also presented in Table 1. Unshaded rows are those where the U-Value is greater than the SL, but the DL is less than the SL. A total of 28 rows (combinations of matrix, analysis group, and constituent; corresponding to 254 results) correspond to instances where the U-Value is greater than the SL but the DL is still less than the SL

A total of 69 rows (corresponding to 911 points, shown in peach and pink) correspond to instances where the U-Value is greater than the SL and the DL is also greater than the SL. In many cases, despite this phenomenon, the data user is still forced to acknowledge a similar exceedance due to detected exceedances in the same sample and within the same analysis group. For example, the nondetect DL for arsenic in VWW06-SD014-0211 exceeds the screening level. Therefore, one may be tempted to say that the data user cannot make sample-specific decisions for metals in VWW06-SD014-0211 because he or she cannot demonstrate that arsenic is absent at the screening level. However, the data user must also acknowledge that the same sample (VWW06-SD014-0211) exceeded the screening level for Aluminum, Chromium, Chromium (hexavalent), Cobalt, and Iron. Therefore, because the sample exceeded for METALs overall, the fact that the arsenic DL exceeded its SL in VWW06-SD014-0211 is largely inconsequential. Such instances (nondetect DL exceeds screening limit but there is another detected exceedance in the same sample for the same analysis group) are highlighted in yellow on Table 1. Roughly half of DL v. SL exceedances (407 instances) fall into this category.

In the remaining instances (rows highlighted in peach and pink on Table 1), there was at least one DL v. SL exceedance and there was no detected exceedance in the same sample for the same analysis group. This occurred for various analytes within SD PEST/PCBs, SD SVOAs, SD VOAs, SW PEST/PCBs, SW SVOAs, SW VOAs, TI METALs, and TI PCBCONGs. Peach shading was used when this phenomenon occurred for some nondetect instances and pink shading was used when this phenomenon occurred for all samples where the instance was nondetect. The net result of this exercise is a systematic method designed to remove distractions and focus the reviewer on instances where there might actually be a data usability issue because of an error, matrix effect, inappropriate concentration range, etc.

Looking at Table 1 from a matrix and analysis group standpoint, one can see that there are several DL v. SL exceedances without a related detected exceedance for SD PEST/PCBs, SW PEST/PCBs, SW SVOAs, and SW VOAs and only a few DL v. SL exceedances without a related detected exceedance for SD SVOAs, SD VOAs, SW SVOAs, and SW VOAs. Potential issues in surface water are only attributed to site-related activities when there is also a potential issue in sediment. For SD SVOAs and SD VOAs, there were very few instances (nine data points out of

884 SD SVOA and SD VOA data points) where nondetect DLs exceeded SLs and there wasn't a detected exceedance for the same sample in the same analysis group. Therefore, the corresponding SW SVOA and SW VOA instances are likely inconsequential, because the SD data are of sufficiently-low concentration. On the other hand, the SD PEST/PCBs (and corresponding SW PEST/PCBs) instances suggest more data may be needed, and this was taken into consideration when designing the second round of sampling, for tissue, when it was determined that ultra-trace PCBCONG (specialty analytical technique) analysis was required.

For tissue, there simply are not better analytical techniques available for determining these analytes. Thallium, 3,3',4,4',5,5'-Hexachlorobiphenyl (169), and 3,3',4,4',5-Pentachlorobiphenyl (126) were indeed the only three analytes needing shading on UFP-SAP addendum Worksheets #15-1 and #15-2. Nevertheless, this phenomenon (nondetect DLs exceeding SLs without a related exceedance) occurred in only a few instances: seven out of 20 thallium nondetects, one out of 19 3,3',4,4',5,5'-Hexachlorobiphenyl (169) nondetects, and six out of eight 3,3',4,4',5-Pentachlorobiphenyl (126) nondetects (most samples were detected for 3,3',4,4',5-Pentachlorobiphenyl (126)). Furthermore, this corresponds to only 14 nondetect DLs out of 3,000 tissue data points.

For these instances where the DL is greater than the SL, the data user must understand that an analyte may be present in a sample at or at greater than the SL, but the laboratory instrumentation may not be sensitive enough to detect it. This phenomenon is unavoidable when projects use a "Full TCL/TAL" approach and the project team is not able to focus on constituents of concern. This is most-common for projects at early stages of investigation. Nevertheless, as described above, this is often inconsequential when it comes to making decisions based on the data, as demonstrated by such a process which considers the analytes and their relationship with each other.

1.0.6 Laboratory Qualifications, Data Validation Qualifiers, Data Validation Reason Codes, Data Availability, and Data Use

Please refer to Table 2. For the complete definitive data set, all combinations of laboratory qualifier, data validation qualifier, and data validation qualifier are provided. Please refer to Table 3. For the complete screening data set, all combinations of laboratory qualifier and final qualifier are provided. For each combination, the count (number of results that possess this combination) is provided as well as the determination of whether such a result is available for use as reported, available for use as qualified, or not available for use (rejected). Totals for each are provided. In addition, the procedure used for qualification is described in addition to the reason for qualification.

A total of 69.69% of the definitive data are available for use as reported by the laboratory. A total of 29.85% of the definitive data are available for use as qualified by the data validator. Altogether, a total of 99.54% of the definitive data are available for use, qualified by applicable. A total of 92.60% of the screening data are available for use as reported by the laboratory. A total of 7.40% of the screening data are available for use after minor qualifications were applied for consistency with Region II. Altogether, 100% of the screening data are available for use. The UFP-SAP project completeness goal of "95% available data" was met for this data set and overall, the data completeness is excellent. A total of 0.46% of the definitive data are rejected and not available for use.

1.1 Vieques SWMU 6 Sediment

The purpose of this data quality evaluation is to summarize the findings of the data validation and any effects on the availability of the sediment data within the Vieques SWMU 6 Report, as well as to provide an assessment of data usability. Sediment samples were collected by CH2M HILL February 4 through February 8, 2011.

1.1.1 SD VOAs

SOM01-List volatiles (no 1,4-Dioxane) were analyzed via SW-846 8260B. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the volatiles fraction:

Validation Qualifier	Reason Code	Count	Percent
U		240	36.92%
UJ	SSL	237	36.46%
UJ	%SOL	139	21.38%
J	SSL	13	2.00%
J	%SOL	11	1.69%
J		4	0.62%
		3	0.46%
J	FD	1	0.15%
J	SSH	1	0.15%
UJ	FD	1	0.15%
	Total:	**650**	**100%**

1.1.2 SD SVOAs

Polycyclic aromatic hydrocarbons (PAHs) comprising 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, and Pyrene were analyzed via SW-846 8270C_SIM. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the semivolatiles fraction:

Validation Qualifier	Reason Code	Count	Percent
UJ	OT	88	37.61%
J	OT	74	31.62%
UJ	%SOL	30	12.82%
		15	6.41%
U		11	4.70%
J	MSL	6	2.56%
J	%SOL	6	2.56%
UJ	BSL	2	0.85%
J		2	0.85%
	Total:	**234**	**100%**

1.1.3 SD PEST/PCBs

SOM01-List PEST/PCBs were analyzed via SW-846 8081A and 8082. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the pesticides and PCBs fraction:

Validation Qualifier	Reason Code	Count	Percent
UJ	%SOL	360	51.95%
UJ	OT	230	33.19%
U		66	9.52%
J	OT	20	2.89%
J	SSH	5	0.72%
UJ	MSL	4	0.58%
J	%SOL	3	0.43%

Validation Qualifier	Reason Code	Count	Percent
		2	0.29%
UJ	2C	1	0.14%
U	%SOL	1	0.14%
NJ	OT	1	0.14%
	Total:	**693**	**100%**

1.1.4 SD METALs

ILM05-List METALs (no cyanide) were analyzed via SW-846 6010B, 6020, 7196A, and 7471A. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the metals fraction:

Validation Qualifier	Reason Code	Count	Percent
J	%SOL	251	43.58%
J	OT	172	29.86%
UJ	%SOL	54	9.38%
UJ	OT	42	7.29%
		24	4.17%
UJ	MBL	9	1.56%
J	MSH	8	1.39%
U		6	1.04%
J		5	0.87%
J	MSL	2	0.35%
J	SD	2	0.35%
U	MBL	1	0.17%
	Total:	**576**	**100%**

1.1.5 SD Screening Data

AVS/SEM was analyzed via EPA 600_R-02-011. Grain size was analyzed via ASTM D422. Ammonia, sulfide, pH, Total Organic Carbon, and Redox (MV) were analyzed via EPA 350.1, SW-846 9031, SW-846 9045, SW-846 9060, and ASTM D1498, respectively. ILM05-List METALs (no cyanide) were analyzed via SW-846 6010B, 6020, 7196A, and 7471A. 100% of the data are available for use. The verification/validation process resulted in the following qualifiers for results in the AVSSEM, GRAINSIZE, and WCHEM fractions:

Analysis Group	Lab Qualifier	Final Qualifier	Count	Percent
AVSSEM			43	14.43%
AVSSEM	B		4	1.34%
AVSSEM	B	J	13	4.36%
AVSSEM	U	U	28	9.40%
GRAINSIZE			132	44.30%
WCHEM			70	23.49%
WCHEM	E	J	8	2.68%
		Total:	**298**	**100%**

1.2 Vieques SWMU 6 Surface Water

The purpose of this data quality evaluation is to summarize the findings of the data validation and any effects on the availability of the surface water data within the Vieques SWMU 6 Report, as well as to provide an assessment of data usability. Surface water samples were collected by CH2M HILL February 3 through February 8, 2011.

1.2.1 SW VOAs

SOM01-List volatiles (no 1,4-Dioxane) were analyzed via SW-846 8260B. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the volatiles fraction:

Validation Qualifier	Reason Code	Count	Percent
U		396	99.00%
U	MBL	4	1.00%
	Total:	**400**	**100%**

1.2.2 SW SVOAs

PAHs were analyzed via SW-846 8270C_SIM. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the semivolatiles fraction:

Validation Qualifier	Reason Code	Count	Percent
U		115	79.86%
U	MBL	19	13.19%
J		4	2.78%
UJ	FD	2	1.39%
J	FD	2	1.39%
		2	1.39%
	Total:	**144**	**100%**

1.2.3 SW PEST/PCBs

SOM01-List PEST/PCBs were analyzed via SW-846 8081A and 8082. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the pesticides and PCBs fraction:

Validation Qualifier	Reason Code	Count	Percent
U		485	96.23%
J		9	1.79%
J	2C	4	0.79%
		4	0.79%
U	2C	1	0.20%
NJ	2C	1	0.20%
	Total:	**504**	**100%**

1.2.4 SW METALs

ILM05-List METALs (no cyanide) were analyzed via SW-846 6010B, 6020, 7196A, and 7470A. 97% of the data are available for use (not R-qualified). The completeness goal of 95% available data was met for this fraction. The validation process resulted in the following qualifiers for results in the metals fraction:

Validation Qualifier	Reason Code	Count	Percent
U		227	49.78%
		70	15.35%
J		49	10.75%
J	SD	24	5.26%
U	MBL	22	4.82%
J	HT	15	3.29%
UJ	MSL	14	3.07%
J	MSH	14	3.07%
R	SD	13	2.85%
J	MSL	4	0.88%
UJ	OT	1	0.22%
UJ	MBL	1	0.22%
UJ	HT	1	0.22%
J	OT	1	0.22%
	Total:	**456**	**100%**

The R-qualifiers were applied due to serial dilution exceedances. R-qualified results are not available for use by the project team, but the data user can confidently draw conclusions with the available data in the overall dataset. In this case, aluminum is the only affected analyte. There are six available (non-rejected) aluminum results in this dataset.

1.2.5 SW FMETALs

ILM05-List METALs (no cyanide) were analyzed via SW-846 6010B, 6020, 7196A, and 7470A. 95% of the data are available for use (not R-qualified). The completeness goal of 95% available data was met for this fraction. The validation process resulted in the following qualifiers for results in the filtered metals fraction:

Validation Qualifier	Reason Code	Count	Percent
U		282	61.98%
		47	10.33%
J		33	7.25%
R	SD	21	4.62%
U	MBL	16	3.52%
J	HT	16	3.52%
J	MSL	14	3.08%
J	SD	6	1.32%
J	MDP	6	1.32%
UJ	MSL	4	0.88%
UJ	HT	3	0.66%
J	MSH	3	0.66%
UJ	OT	2	0.44%
R	FD	2	0.44%
	Total:	**455**	**100%**

The majority of R-qualifiers (21 of 23 R-qualifiers) were applied due to serial dilution exceedances. The remaining R-qualifiers (2 of 23 R-qualifiers) were applied due to field duplicate reproducibility exceedances.

R-qualified results are not available for use by the project team, but the data user can confidently draw conclusions with the available data in the overall dataset. In this case, the affected analytes were filtered aluminum in VWW06-SW007-0211 and VWW06-SW007P-0211 (due to field duplicate reproducibility) and filtered calcium, magnesium, and potassium in VWW06-SW018-0211, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, and VWW06-SW023P-0211. Filtered aluminum results are available in 16 other samples and filtered calcium, magnesium, and potassium are available in 12 other samples. Therefore, there is negligible effect on the data usability due to this issue. This is because filtered metals results are available in the samples for which they were not rejected, the majority of filtered metals results are for nutrients (calcium, magnesium, potassium that have no screening levels), and the completeness goal was met for the corresponding METALs fraction.

1.3 Vieques SWMU 6 Tissue

The purpose of this data quality evaluation is to summarize the findings of the data validation and any effects on the availability of the tissue data within the Vieques SWMU 6 Report, as well as to provide an assessment of data usability. Fish and crab samples were collected by CH2M HILL January 31 through February 1, 2012.

1.3.1 TI METALs

Lead, thallium, and zinc were analyzed via EPA 1638 modified for non-aqueous matrices. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the metals fraction:

Validation Qualifier	Reason Code	Count	Percent
		26	43.33%
U		23	38.33%
J	FD	4	6.67%
J		4	6.67%
J	LD	2	3.33%
J	MSH	1	1.67%
	Total:	**60**	**100%**

1.3.2 TI PCBCONGs

PCB Congeners (209 congeners and co-elutions) were analyzed via EPA 1668A using QA/QC limits from EPA 1668C. 100% of the data are available for use (not R-qualified). The validation process resulted in the following qualifiers for results in the PCB congeners fraction:

Validation Qualifier	Reason Code	Count	Percent
U		1343	37.31%
		1183	32.86%
J		735	20.42%
J	EMPC	262	7.28%
J	MBL	58	1.61%
U	MBL	12	0.33%
J	FD	7	0.19%
	Total:	**3600**	**100%**

1.3.3 TI Screening Data

Percent solids was analyzed via laboratory SOP at Brooks Rand Labs and percent lipids was analyzed via laboratory SOP at TestAmerica-West Sacramento. There were no qualifiers.

1.4 PARCC Considerations

1.4.1 Precision

Precision is defined as the agreement between duplicate results and was characterized by comparing duplicate matrix spike recoveries, laboratory replicates, and field duplicate sample results. For this data set, precision was also assessed by examining dual-column reproducibility (percent difference between instrument columns) and by comparing total metals results to filtered metals results. Refer to section 1.2.4, above. There was a negligible negative impact on data availability due to precision which affected only aluminum in surface water. Aluminum was rejected in VWW06-SW007-0211 and VWW06-SW007P-0211 due to field duplicate reproducibility. Only these two data points are affected. Otherwise, there were no other negative impacts on data availability due to precision because no other data points were deemed unusable (rejected) due to precision exceedances.

1.4.2 Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. For organic analyses, each sample was spiked with surrogate compounds; and for organic and inorganic analyses, an MS/MSD and LCS were spiked with a known parameter concentration before preparation. Internal standards also provide a measure of accuracy. Internal standards, surrogates and MS/MSD provide a measure of the matrix effects on the analytical accuracy. LCS demonstrates accuracy of the method and the laboratory's ability to meet the method criteria. Accuracy is also assessed by calibration recoveries. Refer to sections 1.2.4 and 1.2.5, above. There was a minor negative impact on accuracy which affected aluminum in surface water (affects VWW06-SW003-0211, VWW06-SW004-0211, VWW06-SW005-0211, VWW06-SW006-0211,

VWW06-SW007-0211, VWW06-SW007P-0211, VWW06-SW018-0211, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, and VWW06-SW023P-0211) and filtered calcium, filtered magnesium, and filtered potassium in surface water (affects VWW06-SW018-0211, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, and VWW06-SW023P-0211). Filtered aluminum results were not affected and total calcium, magnesium, and potassium results were not affected. Otherwise, there were no other negative impacts on data availability due to accuracy because no other data points were deemed unusable due to precision exceedances.

1.4.3 Representativeness

Representativeness is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition (in this case, nature and extent of contamination). Representativeness is a subjective parameter and is used to evaluate the efficacy of the sample planning design. In terms of data quality, representativeness was assured because the sampling team following approved standard operating procedures for sample collection and handling, and the laboratory followed approved standard operating procedures for sample handling, preparation, and analysis.

1.4.4 Completeness

For purposes of this DQE, completeness is defined as the percentage of measurements that are judged to be valid; validity being defined by the DQOs. Therefore, completeness is calculated as the number of analytically-sound results that are available for use compared to the total number of measurements made. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*; EPA 540/R-99/008; October, 1999, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*; EPA 540-R-04-004; October, 2004, *Validating Volatile Organic Compounds by SW-846 Method 8260B*; SOP HW-24 Rev. 2; August, 2008, *Validating Semivolatile Organic Compounds by SW-846 Method 8270*; SOP HW-22 Rev. 4; August, 2008, *Data Validation SOP of Organochlorine Pesticides by Gas Chromatography SW-846 Method 8081B*; SOP HW-44 Rev. 1; October, 2006, *Data Validation SOP of Organic Analysis of PCBs by Gas Chromatography SW-846 Method 8082A*; SOP HW-45 Rev. 1; October, 2006, *Data Validation SOP of Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by HRGC/HRMS*; SOP HW-46 Rev. 1; August, 2009, and *Validation of Metals for the Contract Laboratory Program (CLP) based on SOW ILM05.3*; SOP HW-2; September, 2006 designate all results except those R-qualified as "rejected" to be available for use as analytically-sound results. The R-qualifier is the only qualifier that negatively affects a data point's availability. Completeness is provided, above, for each combination of matrix and analysis group.

The overall completeness goal of 95% was met for this data set. It was also met for the individual matrices.

1.4.5 Comparability

Comparability is a qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are sample collection and handling techniques, sample matrix, and analytical methods. In this case, because approved standard operating procedures were used for sample collection and handling, common sample matrices were evaluated (sediment, surface water, and tissue), and EPA, SW-846, and ASTM methods were utilized, the data user may express confidence in the fact that this data set is comparable to others of acceptable data quality. In addition, comparability is controlled by the other PARCC parameters because data sets can be compared with confidence only when precision and accuracy are known. Except in the case of rejected data, precision and accuracy were demonstrated to be acceptable, and the data user may be confident that this data set is comparable to others of high data quality.

1.5 References

CH2M HILL. 2011. *Final Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Solid Waste Management Unit 6*. December.

CH2M HILL. 2011. *Final Addendum Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Solid Waste Management Unit 6*. December.

ORNL. 2012. *Regional Screening Levels for Chemical Contaminants at Superfund Sites*. [Online]. May.

EPA. 2008. *Validating Volatile Organic Compounds by SW-846 Method 8260B*. SOP HW-24, Rev. 2, August.

EPA. 2008. *Validating Semivolatile Organic Compounds by SW-846 Method 8270*. SOP HW-22, Rev. 4, August.

EPA. 2006. *Data Validation SOP of Organochlorine Pesticides by Gas Chromatography SW-846 Method 8081B*. SOP HW-44, Rev. 1, October.

EPA. 2006. *Data Validation SOP of Organic Analysis of PCBs by Gas Chromatography SW-846 Method 8082A*. SOP HW-45, Rev. 1, October.

EPA. 2006. *Validation of Metals for the Contract Laboratory Program (CLP) based on SOW ILM05.3*. SOP HW-2, September.

EPA. 2009. *Data Validation SOP of Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by HRGC/HRMS*. SOP HW-46, Rev. 1, August.

EPA. 2004. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. October.

EPA. 1989. *Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual.* EPA/540/1-89/002, Part A, October.

Table 1

Concentration Range Evaluation

Matrix[1]	Group	Analyte	CAS	SL	Units	# Detects	# NDs	# U-Value > SL	min U-Value	max U-Value	# ND DL > SL	min ND DL	max ND DL	# ND DL > SL w/ no Related Exceedance
SD	METAL	Arsenic	7440-38-2	0.39	MG_KG	22	2	2	1.4	2.5	2	1	1.9	
SD	METAL	Chromium (hexavalent)	18540-29-9	0.29	MG_KG	22	2	2	0.836	0.891	2	0.418	0.445	
SD	METAL	Selenium	7782-49-2	1	MG_KG	6	18	8	0.43	2.5		0.13	0.75	
SD	METAL	Thallium	7440-28-0	0.078	MG_KG	5	19	19	1.26	10.6	19	0.63	5.32	
SD	PEST/PCB	4,4'-DDD	72-54-8	1.22	UG_KG	9	15	14	1	4.5	13	0.51	2.3	12
SD	PEST/PCB	4,4'-DDE	72-55-9	2.2	UG_KG	11	13	1	0.54	2.4		0.27	1.2	
SD	PEST/PCB	4,4'-DDT	50-29-3	1.19	UG_KG	3	21	20	0.76	3.7	12	0.38	1.9	11
SD	PEST/PCB	alpha-BHC	319-84-6	0.32	UG_KG		24	24	1.3	7.4	24	0.82	4.7	14
SD	PEST/PCB	beta-BHC	319-85-7	0.32	UG_KG		24	21	0.26	1.5	19	0.13	0.74	12
SD	PEST/PCB	delta-BHC	319-86-8	0.32	UG_KG		24	24	0.48	2.8	21	0.24	1.4	13
SD	PEST/PCB	Dieldrin	60-57-1	0.715	UG_KG		24	19	0.27	1.6	1	0.14	0.79	
SD	PEST/PCB	Endrin	72-20-8	0.02	UG_KG		24	24	0.44	2.6	24	0.22	1.3	14
SD	PEST/PCB	Endrin aldehyde	7421-93-4	0.02	UG_KG		24	24	0.61	3.5	24	0.31	1.8	14
SD	PEST/PCB	Endrin ketone	53494-70-5	0.02	UG_KG		24	24	0.36	2.1	24	0.18	1	14
SD	PEST/PCB	gamma-BHC (Lindane)	58-89-9	0.32	UG_KG		24	24	0.34	2	21	0.17	0.98	13
SD	PEST/PCB	Heptachlor	76-44-8	0.3	UG_KG		24	24	0.34	2	21	0.17	0.98	13
SD	PEST/PCB	Heptachlor epoxide	1024-57-3	0.3	UG_KG		24	21	0.26	1.5	20	0.13	0.74	13
SD	PEST/PCB	Aroclor-1016	12674-11-2	48	UG_KG		27	14	19	96		9.4	48	
SD	PEST/PCB	Aroclor-1221	11104-28-2	48	UG_KG		27	13	17	89		8.6	44	
SD	PEST/PCB	Aroclor-1232	11141-16-5	48	UG_KG		27	14	22	110	7	14	74	6
SD	PEST/PCB	Aroclor-1242	53469-21-9	48	UG_KG		27	10	16	81		7.9	41	
SD	PEST/PCB	Aroclor-1248	12672-29-6	48	UG_KG		27	10	16	81		7.9	41	
SD	PEST/PCB	Aroclor-1254	11097-69-1	63.3	UG_KG	8	19	2	16	70		7.9	35	
SD	SVOA	Acenaphthene	83-32-9	16	UG_KG	1	12	7	2.6	66.8	3	1.3	33.4	1
SD	SVOA	Acenaphthylene	208-96-8	44	UG_KG	1	12	1	2.6	66.8		1.3	33.4	
SD	SVOA	Benzo(a)pyrene	50-32-8	15	UG_KG	10	3	1	3.3	83.6	1	1.8	45.2	1
SD	SVOA	Dibenz(a,h)anthracene	53-70-3	15	UG_KG		13	8	3.3	83.6	8	2.5	65.3	1
SD	SVOA	Fluorene	86-73-7	19	UG_KG	1	12	4	2.6	66.8	1	1.3	33.4	1
SD	VOA	1,2-Dibromo-3-chloropropane	96-12-8	5.4	UG_KG		13	10	4.6	18.9	5	2.6	10.6	5
SD	VOA	Ethylbenzene	100-41-4	4	UG_KG		13	3	1.3	5.2		0.64	2.6	
SD	VOA	Xylene, total	1330-20-7	4	UG_KG		13	3	1.3	5.1		0.63	2.6	
SW	FMETAL	Antimony	7440-36-0	0.6	UG_L		19	19	10	100	19	10	100	
SW	FMETAL	Arsenic	7440-38-2	0.045	UG_L		19	19	50	132.4	19	19	66.2	
SW	FMETAL	Beryllium	7440-41-7	1.6	UG_L		19	19	2.4	4.8	6	1.2	2.4	
SW	FMETAL	Cadmium	7440-43-9	0.69	UG_L		19	19	10	28.8	19	4.2	14.4	
SW	FMETAL	Chromium	7440-47-3	0.031	UG_L		19	19	8.6	17.2	19	4.3	8.6	
SW	FMETAL	Chromium (hexavalent)	18540-29-9	0.031	UG_L	16	3	3	7	7	3	3.5	3.5	
SW	FMETAL	Cobalt	7440-48-4	0.47	UG_L		19	19	7.4	14.8	19	3.7	7.4	
SW	FMETAL	Copper	7440-50-8	3.1	UG_L	1	18	18	50	108	18	23	54	
SW	FMETAL	Iron	7439-89-6	50	UG_L	2	17	17	110	220	17	55	110	
SW	FMETAL	Lead	7439-92-1	8.1	UG_L	1	18	18	10	20		3.4	6.8	
SW	FMETAL	Nickel	7440-02-0	8.2	UG_L		19	19	18.6	37.2	19	9.3	18.6	
SW	FMETAL	Selenium	7782-49-2	7.8	UG_L	10	9	9	82	164	9	41	82	
SW	FMETAL	Silver	7440-22-4	2	UG_L		19	19	2.5	20.8	18	1.1	10.4	
SW	FMETAL	Thallium	7440-28-0	0.016	UG_L		19	19	88	176	19	44	88	

Table 1

Concentration Range Evaluation

Matrix[1]	Group	Analyte	CAS	SL	Units	# Detects	# NDs	# U-Value > SL	min U-Value	max U-Value	# ND DL > SL	min ND DL	max ND DL	# ND DL > SL w/ no Related Exceedance
SW	FMETAL	Vanadium	7440-62-2	7.8	UG_L	6	13	13	8.8	17.6	6	4.4	8.8	
SW	FMETAL	Zinc	7440-66-6	81	UG_L		19	6	80	160		40	80	
SW	METAL	Antimony	7440-36-0	0.6	UG_L	3	16	16	20	100	16	20	100	
SW	METAL	Arsenic	7440-38-2	0.045	UG_L		19	19	25	132	19	9.5	66.2	
SW	METAL	Beryllium	7440-41-7	1.6	UG_L		19	19	2.4	4.8	6	1.2	2.4	
SW	METAL	Cadmium	7440-43-9	0.69	UG_L	11	8	8	10	28.8	8	4.2	14.4	
SW	METAL	Chromium	7440-47-3	0.031	UG_L		19	19	8.6	17.2	19	4.3	8.6	
SW	METAL	Chromium (hexavalent)	18540-29-9	0.031	UG_L	17	2	2	7	7	2	3.5	3.5	
SW	METAL	Cobalt	7440-48-4	0.47	UG_L		19	19	7.4	14.8	19	1.2	7.4	
SW	METAL	Copper	7440-50-8	3.73	UG_L	12	7	7	25	108	7	12	54	
SW	METAL	Iron	7439-89-6	50	UG_L	11	8	8	110	220	8	55	110	
SW	METAL	Lead	7439-92-1	8.52	UG_L	1	18	18	10	20		3.4	6.8	
SW	METAL	Mercury	7439-97-6	0.051	UG_L	6	13	13	0.074	0.074		0.037	0.037	
SW	METAL	Nickel	7440-02-0	8.28	UG_L		19	19	18.6	37.2	19	9.3	18.6	
SW	METAL	Selenium	7782-49-2	7.8	UG_L	11	8	8	82	164	8	41	82	
SW	METAL	Silver	7440-22-4	2	UG_L		19	19	2.5	20.8	18	1.1	10.4	
SW	METAL	Thallium	7440-28-0	0.016	UG_L	1	18	18	88	176	18	44	88	
SW	METAL	Vanadium	7440-62-2	7.8	UG_L	5	14	14	8.8	17.6	6	4.4	8.8	
SW	METAL	Zinc	7440-66-6	85.6	UG_L		19	6	80	160		40	80	
SW	PEST/PCB	4,4'-DDD	72-54-8	0.001	UG_L	1	18	18	0.0053	0.0055	18	0.0027	0.0028	18
SW	PEST/PCB	4,4'-DDE	72-55-9	0.001	UG_L	1	18	18	0.0078	0.0081	18	0.0039	0.004	18
SW	PEST/PCB	4,4'-DDT	50-29-3	0.001	UG_L	1	18	18	0.0022	0.0023	18	0.0011	0.0012	18
SW	PEST/PCB	Aldrin	309-00-2	0.0002	UG_L	1	18	18	0.0033	0.0034	18	0.0016	0.0017	18
SW	PEST/PCB	alpha-BHC	319-84-6	0.0062	UG_L		19	2	0.0062	0.0064		0.0031	0.0032	
SW	PEST/PCB	alpha-Chlordane	5103-71-9	0.004	UG_L	1	18	18	0.0062	0.0064		0.0031	0.0032	
SW	PEST/PCB	Dieldrin	60-57-1	0.0015	UG_L	1	18	18	0.0055	0.0057	18	0.0028	0.0029	18
SW	PEST/PCB	Endrin ketone	53494-70-5	0.01	UG_L	1	18	18	0.012	0.013		0.0062	0.0064	
SW	PEST/PCB	gamma-Chlordane	5103-74-2	0.004	UG_L	1	18	18	0.0049	0.0051		0.0025	0.0026	
SW	PEST/PCB	Heptachlor	76-44-8	0.0018	UG_L	1	18	18	0.0081	0.0084	18	0.0041	0.0042	18
SW	PEST/PCB	Toxaphene	8001-35-2	0.013	UG_L		19	19	0.37	0.38	19	0.18	0.19	18
SW	PEST/PCB	Aroclor-1221	11104-28-2	0.0043	UG_L		15	15	0.02	0.021	15	0.018	0.018	14
SW	PEST/PCB	Aroclor-1232	11141-16-5	0.0043	UG_L		15	15	0.016	0.017	15	0.0082	0.0083	14
SW	SVOA	Benzo(a)anthracene	56-55-3	0.029	UG_L		8	8	0.041	0.042		0.02	0.021	
SW	SVOA	Benzo(a)pyrene	50-32-8	0.0029	UG_L		8	8	0.041	0.042	8	0.02	0.021	8
SW	SVOA	Benzo(b)fluoranthene	205-99-2	0.029	UG_L		8	8	0.041	0.042		0.02	0.021	
SW	SVOA	Dibenz(a,h)anthracene	53-70-3	0.0029	UG_L		8	8	0.041	0.042	8	0.02	0.021	8
SW	SVOA	Indeno(1,2,3-cd)pyrene	193-39-5	0.029	UG_L		8	8	0.041	0.042		0.02	0.021	
SW	VOA	1,1,2,2-Tetrachloroethane	79-34-5	0.066	UG_L		8	8	0.26	0.26	8	0.13	0.13	8
SW	VOA	1,1,2-Trichloroethane	79-00-5	0.041	UG_L		8	8	0.4	0.4	8	0.2	0.2	8
SW	VOA	1,2-Dibromo-3-chloropropane	96-12-8	0.0003	UG_L		8	8	2	2	8	1	1	8
SW	VOA	1,2-Dibromoethane	106-93-4	0.0065	UG_L		8	8	0.22	0.22	8	0.11	0.11	8
SW	VOA	1,2-Dichloroethane	107-06-2	0.15	UG_L		8	8	0.3	0.3		0.15	0.15	
SW	VOA	Bromodichloromethane	75-27-4	0.12	UG_L		8	8	0.3	0.3	8	0.15	0.15	8
SW	VOA	Bromomethane	74-83-9	0.7	UG_L		8	8	0.86	0.86		0.43	0.43	
SW	VOA	Chloroform	67-66-3	0.19	UG_L		8	8	0.32	0.32		0.16	0.16	

Table 1

Concentration Range Evaluation

Matrix[1]	Group	Analyte	CAS	SL	Units	# Detects	# NDs	# U-Value > SL	min U-Value	max U-Value	# ND DL > SL	min ND DL	max ND DL	# ND DL > SL w/ no Related Exceedance
SW	VOA	Dibromochloromethane	124-48-1	0.15	UG_L		8	8	0.26	0.26		0.13	0.13	
SW	VOA	trans-1,3-Dichloropropene	10061-02-6	0.41	UG_L		8	8	0.6	0.6		0.3	0.3	
SW	VOA	Trichloroethene	79-01-6	0.26	UG_L		8	8	0.38	0.38		0.19	0.19	
SW	VOA	Vinyl chloride	75-01-4	0.015	UG_L		8	8	0.36	0.36	8	0.18	0.18	8
TI	METAL	Thallium	7440-28-0	0.0005	MG_KG		20	20	0.004	0.004	20	0.002	0.002	7
TI	PCBCONG	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	0.81	PG_G	1	19	19	0.95	34	9	0.2	34	1
TI	PCBCONG	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	0.24	PG_G	12	8	8	0.96	4.8	6	0.21	2.1	6

1 SD Matrix includes three SS samples analyzed for Aroclors.

[all rows] A row is provided to represent each instance (combination of matrix, analysis group, and anlayte) for which at least one U-Value exceeds the screening level.

Light yellow shading indicates instances for which at least one nondetect DL exceeds the screening level.

Peach shading indicates instances for which at least one nondetect DL exceeds the screening level and there is not a related detected exceedance (within the same analysis group for the same sample).

Pink shading indicates instances for which the nondetect DL exceeds the screening level and there is not a related detected exceedance for all samples where the instance is nondetect.

Table 2

Definitive Data – Qualifiers, Availability, and Effect on Data Usability

Lab Qual	DV Qual	Reason Code	Count	Available as Reported	Available as Qualified	Not Available	Comment
U	U		3140	40.40%			Not detected by the laboratory. The reported result is the LOD. No further qualification was necessary.
			1169	15.04%			Detected by the laboratory. No further qualification was necessary.
J or B	J		788	10.14%			Detected by the laboratory at less than the LOQ. No further qualification was necessary. The result is available for use at the reported value as long as the data user understands that it is "estimated".
U	UJ	%SOL	583		7.50%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to high percent moisture.
U	UJ	OT	363		4.67%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" for reasons of "other". In this case, qualification was due to cooler temperature.
JQ or Q or JQB or QB	J	EMPC	262		3.37%		Detected by the laboratory (at less than the LOQ if applicable). A miscellaneous QA/QC exceedance was noted. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to "estimated maximum possible concentration".
U	UJ	SSL	237		3.05%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to low spiked surrogate recovery.
	J	%SOL	233		3.00%		Detected by the laboratory. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to high percent moisture.
	J	OT	212		2.73%		Detected by the laboratory. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to reasons of "other". In this case, qualification was due to cooler temperature.
B			203	2.61%			Detected by the laboratory. Although blank contamination was noted, no further qualification was necessary.

Table 2

Definitive Data – Qualifiers, Availability, and Effect on Data Usability

Lab Qual	DV Qual	Reason Code	Count	Available as Reported	Available as Qualified	Not Available	Comment
JB	J		57	0.73%			Detected by the laboratory at less than the LOQ and blank contamination was noted. No further qualification was necessary due to blank contamination. The result is available for use at the reported value as long as the data user understands that it is "estimated".
J or P or JP	J	OT	55		0.71%		Detected by the laboratory and a miscellaneous QA/QC exceednace was noted (including that the result was less than the LOQ, if applicable). The result is available for use at the reported value as long as the data user understands that it is "estimated" due to reasons of "other". In this case, qualification was due to cooler temperature.
JB or JQB or B or J	J	MBL	58		0.75%		Detected by the laboratory at less than the LOQ and a miscellaneous QA/QC exceedance (including for blank contamination, if applicable) was noted. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to blank contamination.
UJQ or UJ or UJB or UJQB	U		55	0.71%			Not detected by the laboratory. The reported result is the LOD. A miscellaneous QA/QC exceedance was noted. No further qualification was necessary.
J or JB	U	MBL	56		0.72%		Detected by the laboratory at less than the LOQ. The data validator determined that the detect was not significantly high compared to the blank contamination, applied a U-flag, and raised the result to the LOD (if less than the LOD). The result is available for use as a nondetect as long as the data user understands that it was "not detected at significantly greater than that in an associated blank" due to method blank contamination.
	J	HT	26		0.33%		Detected by the laboratory. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to a slight holding time exceedance.
J	J	%SOL	24		0.31%		Detected by the laboratory at less than the LOQ. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to high percent moisture.

Table 2

Definitive Data – Qualifiers, Availability, and Effect on Data Usability

Lab Qual	DV Qual	Reason Code	Count	Available as Reported	Available as Qualified	Not Available	Comment
[none] or J	R	SD	34			0.44%	Various aqueous metals and filtered metals (comprising aluminum, calcium, magnesium, and potassium) were detected (at less than the LOQ, if applicable). The results were rejected and are not available for use due to extreme serial dilution exceedances. Refer to sections 1.2.4 and 1.2.5 for more information.
U	UJ	MSL	22		0.28%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to low matrix spike recovery.
[none] or J	J	SD	32		0.41%		Detected by the laboratory (at less than the LOQ, if applicable). The result is available for use at the reported value as long as the data user understands that it is "estimated" due to serial dilution (precision exceedance).
B or JQB	U	MBL	18		0.23%		Detected by the laboratory and a miscellaneous QA/QC exceedance (including for blank contamination) was noted. The data validator determined that the detect was not significantly high compared to the blank contamination, applied a U-flag, and raised the result to the LOD (if less than the LOD). The result is available for use as a nondetect as long as the data user understands that it was "not detected at significantly greater than that in an associated blank" due to method blank contamination.
[none] or J or M	J	MSH	26		0.33%		Detected by the laboratory and a miscellaneous QA/QC exceedance was noted (if applicable). The result is available for use at the reported value as long as the data user understands that it is "estimated" due to high matrix spike recovery.
[none] or J	J	MSL	26		0.33%		Detected by the laboratory (at less than the LOQ, if applicable). The result is available for use at the reported value as long as the data user understands that it is "estimated" due to low matrix spike recovery.
[none] or B	J	FD	14		0.18%		Detected by the laboratory and a miscellaneous QA/QC exceedance was noted (if applicable). The result is available for use at the reported value as long as the data user understands that it is "estimated" due to field duplicate precision.

Table 2

Definitive Data – Qualifiers, Availability, and Effect on Data Usability

Lab Qual	DV Qual	Reason Code	Count	Available as Reported	Available as Qualified	Not Available	Comment
B or JQB	UJ	MBL	10		0.13%		Detected by the laboratory and a miscellaneous QA/QC exceedance was noted. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to method blank contamination and another unspecified QA/QC exceedance.
[none] or J	J	SSL	13		0.17%		Detected by the laboratory (at less than the LOQ, if applicable). The result is available for use at the reported value as long as the data user understands that it is "estimated" due to low matrix spike recovery.
E or B or JP	J	%SOL	14		0.18%		Detected by the laboratory and a miscellaneous QA/QC exceedance was noted. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to high percent moisture.
	J	MDP	6		0.08%		Detected by the laboratory. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to MS/MSD precision exceedance.
J	J	HT	5		0.06%		Detected by the laboratory at less than the LOQ. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to a slight holding time exceedance.
[none] or J or JP	J	SSH	6		0.08%		Detected by the laboratory and a miscellaneous QA/QC exceedance was noted (if applicable). The result is available for use at the reported value as long as the data user understands that it is "estimated" due to high spiked surrogate recovery.
JP	J	2C	4		0.05%		Detected by the laboratory at less than the LOQ and miscellaneous QA/QC exceedances were noted. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to poor dual-column reproducibility (precision exceedance).
U	UJ	HT	4		0.05%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to a slight holding time exceedance.

Table 2

Definitive Data – Qualifiers, Availability, and Effect on Data Usability

Lab Qual	DV Qual	Reason Code	Count	Available as Reported	Available as Qualified	Not Available	Comment
J or G			4	0.05%			Detected by the laboratory. Although a miscellaneous QA/QC exceedance was noted, no further qualification was necessary.
JB	UJ	FD	2		0.03%		Detected by the laboratory at less than the LOQ and blank contamination was noted. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to field duplicate reproducibility (precision exceedance) in addition to blank contamination.
U	UJ	BSL	2		0.03%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to low laboratory control sample recovery.
BM or M	J	LD	2		0.03%		Detected by the laboratory and a miscellaneous QA/QC exceedance was noted. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to laboratory replicate precision.
J or U	R	FD	2			0.03%	Filtered aluminum was detected in VWW06-SW007-0211 but not in VWW06-SW007P-0211. The results were rejected and are not available for use due to extreme field duplicate reproducibility (precision exceedance). Refer to sections 1.2.4 and 1.2.5 for more information.
JP	NJ	2C	1		0.01%		Detected by the laboratory at less than the LOQ and a miscellaneous QA/QC exceedance was noted. The data validator determined that qualitative identification was questionable due to poor resolution. The result is available for use at the reported value as long as the data user understands that it is "tentatively identified, estimated" due to poor dual-column reproducibiltiy (precision exceedance).

Table 2

Definitive Data – Qualifiers, Availability, and Effect on Data Usability

Lab Qual	DV Qual	Reason Code	Count	Available as Reported	Available as Qualified	Not Available	Comment
JP	U	2C	1		0.01%		Detected by the laboratory at less than the LOQ and a miscellaneous QA/QC exceedance was noted. The result is available for use at the reported LOD as long as the data user understands that it is "not detected at significantly greater than that in an associated blank" due to poor dual-column reproducibility (precision exceedance) in addition to blank contamination.
JP	UJ	2C	1		0.01%		Detected by the laboratory at less than the LOQ and a miscellaneous QA/QC exceedance was noted. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to poor dual-column reproducibility (precision exceedance) in addition to blank contamination.
P	NJ	OT	1		0.01%		Detected by the laboratory and a miscellaneous QA/QC exceedance was noted. The data validator determined that qualitative identification was questionable due to poor resolution. The result is available for use at the reported value as long as the data user understands that it is "tentatively identified, estimated" due to reasons of "other". In this case, qualification was due to cooler temperature (in addition to dual-column precision).
U	UJ	FD	1		0.01%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to field duplicate reproducibility (precision exceedance).
		Totals:	7772	69.69%	29.85%	0.46%	99.54% of the definitive data are available for use, qualified as applicable. The UFP-SAP completeness goal of "95% available data" was met.

Table 3

Screening Data – Qualifiers, Availability, and Effect on Data Usability

Lab Qual	Final Qual	Count	Available as Reported	Available as Qualified	Comment
		285	84.32%		Detected by the laboratory. No further qualification was necessary.
U	U	28	8.28%		Not detected by the laboratory. The reported result is the LOD. No further qualification was necessary.
B	J	13		3.85%	Detected by the laboratory. B-qualifier indicates either "also present in a laboratory blank" or "below reporting limit". B-qualifiers were cleared because they are not familiar to Region II. Sample detects are significantly greater than blank detects if applicable. A J-qualifier was applied to indicate that these results are less than the LOQ. The result is available for use at the reported value as long as the data user understands that it is "estimated".
E	J	8		2.37%	Detected by the laboratory. E-qualifier indicates "calibration range exceedance". Further dilution was not possible for these TOC samples. E-qualifiers were cleared because they are not familiar to Region II. A J-qualifier was applied to indicate that these results are greater than the upper calibration limit. The result is available for use at the reported value as long as the data user understands that it is "estimated".
B		4		1.18%	Detected by the laboratory. B-qualifier indicates "also present in a laboratory blank". B-qualifiers were cleared because they are not familiar to Region II. Sample detects are significantly greater than blank detects. The result is available for use at the reported value.
	Totals:	338	92.60%	7.40%	100% of the screening data are available for use, qualified as applicable. The UFP-SAP completeness goal of "95% available data" was met.

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

April 20, 2011
SDG# 3501977, PEL; K0201/K0201D Mitkem
Vieques Island, Puerto Rico

Dear Ms. Weber,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 3501977/K0201/K0201D. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, 8081B-Rev. 1.0, October 2006-SOP HW-44, 8082A- Rev 1, October 2006- SOP# HW-45, and ILM05.3-Rev. 13, September 2006-SOP #HW-2) and professional judgment. The SOP for the inorganic parameters (metals) is used but is modified as necessary to reflect the QC requirements of the method and the site SAP. Region II has not developed a validation checklist SOP for the method used to assess hexavalent chromium in this SDG (SW-846 method 7196A). Alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	V	SV	Pest	PCB	TM 6010	DM 6010	TM 6020	DM 6020	T Hg	D Hg	T HCr	D HCr
VWW06-SW003-0211	350197701	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW004-0211	350197702	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW005-0211	350197705	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW006-0211	350197706	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW007-0211	350197707	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW007P-0211	350197708	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-EB01-020311	350197709	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-TB01-020311	350197710	water	X											
VWW06-SW004-0211MS	350197702MS	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW004-0211MSD	350197702MSD	water	X	X	X	X	X	X	X	X	X	X	X	X

The following quality control samples were provided with this SDG: sample VWW06-EB01-020611 - equipment blank; sample VWW06-TB01-020311- trip blank; and sample VWW06-SW007P-0211- field duplicate of sample VWW06-SW007-0211.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times
- GC/MS Tuning *

• GC Performance	*
• ICP MS Tuning	*
• Initial/Continuing Calibrations	*
• ICSA/ICSAB Standards	*
• LLQ Standards	*
• Blanks	
• Internal Standards	*
• Surrogate Recoveries	*
• Laboratory Control Samples	*
• Matrix Spike Recoveries	
• Matrix Duplicate RPDs	
• Serial Dilutions	
• Field Duplicates	
• Identification/Quantitation	
• Reporting Limits	*
• Tentatively Identified Compounds	NA

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. Please note that when a compound or analyte is flagged due to blank contamination the BL qualifier code takes precedence over all other qualifier codes except a code that explains rejected data.

Please note: the validator has added a T or a D to the metals IDs to indicate total or dissolved as necessary.

VOA

Due to blank contamination, qualifications were added to the data.

SVOA

Due to blank contamination, qualifications were added to the data. Samples were re-analyzed due to contamination above the reporting limit in the method blanks; however due to exceeded holding times these samples were not used.

Comparable results were not exhibited in the field duplicate pair which resulted in qualifications to the data.

Pesticides

Some reported positive results required qualification based on column quantitation %Ds greater than 40%.

PCBs

No qualifications to the data were required.

Total & Dissolved Metals

Blank contamination was noted and qualification was required in the samples in this SDG.

The submitted matrix spike exhibited non-compliant recoveries. Qualifications to the data were required. Please note that not all recoveries were used to assess the field samples because of the high dilutions required due to internal standard area recovery issues.

The matrix duplicate exhibited one non-compliant RPD and qualifications were added to the data.

The serial dilution analyses exhibited non-compliant %Ds. Results were qualified or rejected based on Region II guidelines.

The field duplicate pair analyzed for the dissolved metals exhibited one analyte that did not meet criteria. Based on Region II guidelines the analyte required rejection in the field duplicate pair only.

Sodium was reported in one sample in both the 1:20 DL and in the 1:100 DL. The 1:20 DL result was excluded in favor of the result from the 1:100 DL analysis.

Hexavalent Chromium

All samples exceeded the required 24-hour holding time; therefore results were qualified as estimated.

Specific Evaluation of Data

Data Completeness

The data validators have corrected all Form Is to reflect the correct sample ID for sample VWW06-SW007P-0211 as the laboratory forms were mislabeled VWW06-SW007R-0211. Resubmissions were required for the 6010B metals fraction due to incorrectly calculated MS/MSD recoveries. The laboratory submitted corrected form 3's and revised the case narrative to reflect these corrections. A copy of all email correspondence is included in the validation worksheets section of this report. Resubmissions were required for the metals fractions. The low level quantitation standard summary data was not present in the data packages. Both PEL and Mitkem were notified and they submitted responses to the request. Copies of the responses are included in the validation worksheets section of this report.

Technical Holding Times

According to chain of custody records, sampling was performed on 2/3/11 and samples were received at PEL on 2/4/11 and at Mitkem on 2/9/11. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

Hexavalent Chromium

All total and dissolved water samples exceeded the 24 hour holding time by 2-8 hours; therefore results were qualified as estimated (J/UJ) (qualifier code: HT).

Blanks

VOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table.

Blank ID	Compound	Concentration	Reporting Limit (LOD)
021411BLK32	acetone	3.7 ug/L	2.6 ug/L
021511BLKA34	acetone	33.3J	2.6

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code
VWW06-SW004-0211, VWW06-SW006-0211	acetone	U at value	MBL

SVOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table.

Blank ID	Compound	Concentration	Reporting Limit (LOD)
70262MB	2-methylnaphthalene	0.025J	0.04
	fluorene	0.036J	0.04
	naphthalene	0.028J	0.04
	phenanthrene	0.057	0.04
	pyrene	0.022J	0.04

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Q Code
VWW06-SW003-0211, VWW06-SW005-0211, VWW06-SW006-0211, VWW06-SW007-0211, VWW06-SW007P-0211, VWW06-SW004-0211	2-methylnaphthalene	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW007P-0211, VWW06-SW004-0211	fluorene	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW005-0211, VWW06-SW006-0211, VWW06-SW007-0211, VWW06-SW007P-0211, VWW06-SW004-0211	naphthalene	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW007P-0211, VWW06-SW004-0211	phenanthrene	U at value	MBL
VWW06-SW003-0211, VWW06-SW005-0211, VWW06-SW004-0211	pyrene	U at LOD	MBL

Total & Dissolved Metals

Associated blanks exhibited contamination as noted in the following table.

Blank ID	Analyte	Concentration	Action Level
CCB5 6010B Total	aluminum	13.9J ug/L	LOD
CCB5 6010B Dissolved	beryllium	0.141J ug/L	
CCB6 6010B Dissolved	iron	10.3J ug/L	
ICB #1 6020 Total	arsenic	0.226J ug/L	
	lead	0.170J ug/L	
ICB #2 6020 Total	arsenic	0.260J ug/L	
CCB 12 6020 Total	lead	0.071J ug/L	
ICB #2 6020 Dissolved	arsenic	0.260J ug/L	

Please note, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag	Q Code
VWW06-SW007-0211 T, VWW06-SW007P-0211 T	aluminum	U at LOD	MBL
VWW06-SW004-0211 D	beryllium	U at LOD	MBL
VWW06-SW005-0211 D	iron	U at LOD	MBL
VWW06-SW003-0211 T, VWW06-SW006-0211 T, VWW06-SW004-0211 D, VWW06-SW006-0211 D, VWW06-SW007P-0211 D	arsenic	U at LOD	MBL
VWW06-SW003-0211 T, VWW06-SW004-0211 T, VWW06-SW005-0211 T	lead	U at LOD	MBL

Matrix Spike Recoveries

Metals and Cyanide

The matrix spike pair submitted in this SDG exhibited non-compliant %R's, requiring qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table. Please note that the ICP-MS recoveries were not used to assess the field samples because of the high dilutions required due to internal standard area recovery issues. The mercury post-digestion spike recoveries were also low (T - 63.4 & D - 67.1)

MS	Analytes	Samples	%R	Q Flag	Q Code
VWW06-SW004-0211 T	mercury	all total field samples	62/64.7	J/UJ	MSL
	selenium		73.4/75.8	J/UJ	MSL
	aluminum		126.3/147.7	J	MSH
	iron		129.2/149.2	J	MSH
VWW06-SW004-0211 D	mercury	all dissolved field samples	67.3/68.6	J/UJ	MSL

Matrix Duplicates

Total and Dissolved Metals

The matrix duplicate submitted for the dissolved metals 6010B analysis exhibited a non-compliant RPD for one analyte. A summary of this non-compliance and affected samples are noted in the following table.

MD	Analytes	Samples	RPD	Q Flag	Q Code
VWW06-SW004-0211 D	sodium	all dissolved field samples	28.1	J/UJ	MDP

Serial Dilutions

Total & Dissolved Metals

The serial dilution submitted for the total metals 6010B analysis exhibited non-compliant %Ds, requiring qualification/rejection in the field samples. A summary of these non-compliances and affected samples are noted in the following table. Qualifications were made per Region II guidelines.

SD	Analytes	Samples	%D	Q Flag	Q Code
VWW06-SW004-0211 T	aluminum	all total water field samples	190	R	SD
	calcium		11	J/UJ	
	magnesium		59		

Field Duplicate

SVOA

Sample VWW06-SW007-0211 and duplicate sample VWW06-SW007P-0211 did not exhibit comparable results for fluorene with 200% RPD and phenanthrene with 200% RPD; therefore results for these compounds were qualified as estimated in these samples, qualifier code: FD.

Total & Dissolved Metals

The field duplicate pair of sample VWW06-SW007-0211 and VWW06-SW007P-0211 exhibited a non-compliant absolute difference for aluminum at 858. When results are less than 5X the LOD the criteria for rejection is +/- 2X LOD and the aluminum LOD is 372. Note – LOD is substituted for CRQL since LOD is the reporting limit in these samples. The reported results for aluminum in the field duplicate pair were rejected with a qualifier code of FD.

Identification/Quantitation

SVOA

All samples were re-analyzed due to method blank contaminations above the reporting limit; however these samples were re-analyzed out of holding time and therefore were excluded in favor of the initial analysis.

Pesticides

Qualifications were required in the samples due to high (>40%) column quantitation %Ds. Region II guidelines were followed in applying these qualifications. Sample results were flagged as noted in the following table.

Sample ID	Compound	Column Quant %D	Qualifier	Q Code
VWW06-EB01-020311	endosulfan II	53.76	J	2C
	4,4'-DDD	47.37	J	
	methoxychlor	43.48	J	

Total & Dissolved Metals

Sodium was reported in sample VWW06-SW004-0211 D in both the 1:20 DL and in the 1:100 DL. The 1:20 DL result was excluded in favor of the result from the 1:100 DL analysis with a qualifier code of DL.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff
President

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SW004-0211, VWW06-SW006-021	acetone	+	U at value	MBL

SVOA

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SW003-0211, VWW06-SW005-0211, VWW06-SW006-0211, VWW06-SW007-0211, VWW06-SW007P-0211, VWW06-SW004-0211	2-methylnaphthalene	+	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW007P-0211, VWW06-SW004-0211	fluorene	+	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW005-0211, VWW06-SW006-0211, VWW06-SW007-0211, VWW06-SW007P-0211, VWW06-SW004-0211	naphthalene	+	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW007P-0211, VWW06-SW004-0211	phenanthrene	+	U at value	MBL
VWW06-SW003-0211, VWW06-SW005-0211, VWW06-SW004-0211	pyrene	+	U at LOD	MBL
VWW06-SW007-0211, VWW06-SW007P-0211	fluorene phenanthrene	+/-	J/UJ	FD
all re-analyzed samples	all results	+/-	exclude	RE

Pesticides

Sample ID	Compound	Results	Q flag	Q Code
VWW06-EB01-020311	endosulfan II 4,4'-DDD methoxychlor	+JP	J	2C

PCBs

Sample ID	Compound	Results	Q flag	Q Code
No qualifications required				

Summary of Data Qualifications

Total & Dissolved Metals

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SW007-0211 T, VWW06-SW007P-0211 T	aluminum	+J	U at LOD	MBL*
VWW06-SW004-0211 D	beryllium	+J	U at LOD	MBL
VWW06-SW005-0211 D	iron	+J	U at LOD	MBL
VWW06-SW003-0211 T, VWW06-SW006-0211 T, VWW06-SW004-0211 D, VWW06-SW006-0211 D, VWW06-SW007P-0211 D	arsenic	+J	U at LOD	MBL
VWW06-SW003-0211 T, VWW06-SW004-0211 T, VWW06-SW005-0211 T	lead	+J	U at LOD	MBL
all total and dissolved field samples	mercury	+/-	J/UJ	MSL
all total field samples	selenium	+/-	J/UJ	MSL
all total field samples	aluminum* iron	+	J	MSH
all dissolved field samples	sodium	+/-	J/UJ	MDP
all total field samples	aluminum	+/-	R	SD
all total field samples	calcium magnesium	+/-	J/UJ	SD
VWW06-SW007-0211 D, VWW06-SW007P-0211 D	aluminum	+	R	FD
VWW06-SW004-0211 D 1:20	sodium	+	exclude	DL

**Final qualifier code is SD*

Hexavalent Chromium

Sample ID	Compound	Results	Q flag	Q Code
all total and dissolved samples	hexavalent chromium	+/-	J/UJ	HT

CH2M HILL
SWMU 6- Vieques, Puerto Rico
SDG# 3501977/K0201/K0201D

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.

J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.

J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action - The sample result is greater than the RL and greater than ten times (10X) the blank value.

U - The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the FB result is less or greater than the RL.

R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.

J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

General Abbreviations

RL	reporting limit
PQL	practical quantitation limit
IDL	instrument detection limit
MDL	method detection limit
CRDL	contract required detection limit
CRQL	contract required quantitation limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701 Lab File ID: 97701.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1012

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701 Lab File ID: 97701.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1012

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702 Lab File ID: 97702.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 0949

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.8	U, MBL	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702 Lab File ID: 97702.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 0949

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705 Lab File ID: 97705.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1034

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705 Lab File ID: 97705.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1034

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706 Lab File ID: 97706.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1057

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	3.6	U, MDL ✓	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706 Lab File ID: 97706.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1057

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707 Lab File ID: 97707.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1121

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

090311 1731

VWW 041211

Form I

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707 Lab File ID: 97707.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1121

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007R-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708 Lab File ID: 97708R.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/16/11 Time: 0550

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007R-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708 Lab File ID: 97708R.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/16/11 Time: 0550

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709 Lab File ID: 97709.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1206

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	0.82	J	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709 Lab File ID: 97709.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1206

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

090311 1731

WW 04/12/11

Form I

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-020311

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197710 Lab File ID: 97710.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1229

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

090311 1731

VW 021411

Form I

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-020311

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197710 Lab File ID: 97710.D

Sample wt/vol: 5 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1229

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701 Lab File ID: 97701.D

Sample wt/vol: 965 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1745

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.021	0.041	0.052
91-57-6	2-Methylnaphthalene	0.041 ~~0.026~~ U,MBL ~~JB~~		0.021	0.041	0.052
83-32-9	Acenaphthene	0.041	U	0.021	0.041	0.052
208-96-8	Acenaphthylene	0.041	U	0.021	0.041	0.052
120-12-7	Anthracene	0.041	U	0.021	0.041	0.052
56-55-3	Benzo(a)anthracene	0.041	U	0.021	0.041	0.052
50-32-8	Benzo(a)pyrene	0.041	U	0.021	0.041	0.052
205-99-2	Benzo(b)fluoranthene	0.041	U	0.021	0.041	0.052
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.021	0.041	0.052
207-08-9	Benzo(k)fluoranthene	0.041	U	0.021	0.041	0.052
218-01-9	Chrysene	0.041	U	0.021	0.041	0.052
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.021	0.041	0.052
206-44-0	Fluoranthene	0.041	U	0.021	0.041	0.052
86-73-7	Fluorene	0.041 ~~0.035~~ U,MBL ~~JB~~		0.021	0.041	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.021	0.041	0.052
91-20-3	Naphthalene	0.041 ~~0.03~~ U,MBL ~~JB~~		0.021	0.041	0.052
85-01-8	Phenanthrene	0.051 U,MBL ~~JB~~		0.021	0.041	0.052
129-00-0	Pyrene	0.041 ~~0.025~~ U,MBL ~~J~~		0.021	0.041	0.052

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW003-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701RE1 Lab File ID: 97701.D

Sample wt/vol: 975 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 0234

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.02	0.041	0.051
91-57-6	2-Methylnaphthalene	0.041	U	0.02	0.041	0.051
83-32-9	Acenaphthene	0.041	U	0.02	0.041	0.051
208-96-8	Acenaphthylene	0.041	U	0.02	0.041	0.051
120-12-7	Anthracene	0.041	U	0.02	0.041	0.051
56-55-3	Benzo(a)anthracene	0.041	U	0.02	0.041	0.051
50-32-8	Benzo(a)pyrene	0.041	U	0.02	0.041	0.051
205-99-2	Benzo(b)fluoranthene	0.041	U	0.02	0.041	0.051
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.02	0.041	0.051
207-08-9	Benzo(k)fluoranthene	0.041	U	0.02	0.041	0.051
218-01-9	Chrysene	0.041	U	0.02	0.041	0.051
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.02	0.041	0.051
206-44-0	Fluoranthene	0.041	U	0.02	0.041	0.051
86-73-7	Fluorene	0.041	U	0.02	0.041	0.051
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.02	0.041	0.051
91-20-3	Naphthalene	0.032	J	0.02	0.041	0.051
85-01-8	Phenanthrene	0.041	U	0.02	0.041	0.051
129-00-0	Pyrene	0.041	U	0.02	0.041	0.051

exclude RE

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702 Lab File ID: 97702.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1815

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.021	0.041	0.052
91-57-6	2-Methylnaphthalene	0.41 ~~0.026~~ U, MB, ~~JB~~		0.021	0.041	0.052
83-32-9	Acenaphthene	0.041	U	0.021	0.041	0.052
208-96-8	Acenaphthylene	0.041	U	0.021	0.041	0.052
120-12-7	Anthracene	0.041	U	0.021	0.041	0.052
56-55-3	Benzo(a)anthracene	0.041	U	0.021	0.041	0.052
50-32-8	Benzo(a)pyrene	0.041	U	0.021	0.041	0.052
205-99-2	Benzo(b)fluoranthene	0.041	U	0.021	0.041	0.052
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.021	0.041	0.052
207-08-9	Benzo(k)fluoranthene	0.041	U	0.021	0.041	0.052
218-01-9	Chrysene	0.041	U	0.021	0.041	0.052
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.021	0.041	0.052
206-44-0	Fluoranthene	0.041	U	0.021	0.041	0.052
86-73-7	Fluorene	0.041 ~~0.039~~ U, MB, ~~JB~~		0.021	0.041	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.021	0.041	0.052
91-20-3	Naphthalene	0.041 ~~0.027~~ U, MB, ~~JB~~		0.021	0.041	0.052
85-01-8	Phenanthrene	0.059 U, MB, ~~B~~		0.021	0.041	0.052
129-00-0	Pyrene	0.041 ~~0.028~~ U, MB, ~~J~~		0.021	0.041	0.052

1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW004-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702RE1 Lab File ID: 97702.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 0303

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.021	0.041	0.052
91-57-6	2-Methylnaphthalene	0.041	U	0.021	0.041	0.052
83-32-9	Acenaphthene	0.041	U	0.021	0.041	0.052
208-96-8	Acenaphthylene	0.041	U	0.021	0.041	0.052
120-12-7	Anthracene	0.041	U	0.021	0.041	0.052
56-55-3	Benzo(a)anthracene	0.041	U	0.021	0.041	0.052
50-32-8	Benzo(a)pyrene	0.041	U	0.021	0.041	0.052
205-99-2	Benzo(b)fluoranthene	0.041	U	0.021	0.041	0.052
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.021	0.041	0.052
207-08-9	Benzo(k)fluoranthene	0.041	U	0.021	0.041	0.052
218-01-9	Chrysene	0.041	U	0.021	0.041	0.052
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.021	0.041	0.052
206-44-0	Fluoranthene	0.041	U	0.021	0.041	0.052
86-73-7	Fluorene	0.041	U	0.021	0.041	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.021	0.041	0.052
91-20-3	Naphthalene	0.041	U	0.021	0.041	0.052
85-01-8	Phenanthrene	0.041	U	0.021	0.041	0.052
129-00-0	Pyrene	0.041	U	0.021	0.041	0.052

exclude, RE

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705 Lab File ID: 97705.D

Sample wt/vol: 975 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1943

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.02	0.041	0.051
91-57-6	2-Methylnaphthalene	0.041 ~~0.031~~ U, MBL ~~JB~~		0.02	0.041	0.051
83-32-9	Acenaphthene	0.041	U	0.02	0.041	0.051
208-96-8	Acenaphthylene	0.041	U	0.02	0.041	0.051
120-12-7	Anthracene	0.041	U	0.02	0.041	0.051
56-55-3	Benzo(a)anthracene	0.041	U	0.02	0.041	0.051
50-32-8	Benzo(a)pyrene	0.041	U	0.02	0.041	0.051
205-99-2	Benzo(b)fluoranthene	0.041	U	0.02	0.041	0.051
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.02	0.041	0.051
207-08-9	Benzo(k)fluoranthene	0.041	U	0.02	0.041	0.051
218-01-9	Chrysene	0.041	U	0.02	0.041	0.051
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.02	0.041	0.051
206-44-0	Fluoranthene	0.041	U	0.02	0.041	0.051
86-73-7	Fluorene	0.043	~~JB~~	0.02	0.041	0.051
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.02	0.041	0.051
91-20-3	Naphthalene 0.041	0.031 U, MBL	~~JB~~	0.02	0.041	0.051
85-01-8	Phenanthrene	0.064	~~B~~	0.02	0.041	0.051
129-00-0	Pyrene 0.041	0.024 U, MBL	~~J~~	0.02	0.041	0.051

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW005-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705RE1 Lab File ID: 97705.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 0431

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.021	0.041	0.052
91-57-6	2-Methylnaphthalene	0.041	U	0.021	0.041	0.052
83-32-9	Acenaphthene	0.041	U	0.021	0.041	0.052
208-96-8	Acenaphthylene	0.041	U	0.021	0.041	0.052
120-12-7	Anthracene	0.041	U	0.021	0.041	0.052
56-55-3	Benzo(a)anthracene	0.041	U	0.021	0.041	0.052
50-32-8	Benzo(a)pyrene	0.041	U	0.021	0.041	0.052
205-99-2	Benzo(b)fluoranthene	0.041	U	0.021	0.041	0.052
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.021	0.041	0.052
207-08-9	Benzo(k)fluoranthene	0.041	U	0.021	0.041	0.052
218-01-9	Chrysene	0.041	U	0.021	0.041	0.052
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.021	0.041	0.052
206-44-0	Fluoranthene	0.041	U	0.021	0.041	0.052
86-73-7	Fluorene	0.041	U	0.021	0.041	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.021	0.041	0.052
91-20-3	Naphthalene	0.024	J	0.021	0.041	0.052
85-01-8	Phenanthrene	0.022	J	0.021	0.041	0.052
129-00-0	Pyrene	0.041	U	0.021	0.041	0.052

exclude RE

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706 Lab File ID: 97706.D

Sample wt/vol: 960 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 2013

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.042	U	0.021	0.042	0.052
91-57-6	2-Methylnaphthalene	0.042 ~~0.032~~ U, MBL ~~JB~~		0.021	0.042	0.052
83-32-9	Acenaphthene	0.042	U	0.021	0.042	0.052
208-96-8	Acenaphthylene	0.042	U	0.021	0.042	0.052
120-12-7	Anthracene	0.042	U	0.021	0.042	0.052
56-55-3	Benzo(a)anthracene	0.042	U	0.021	0.042	0.052
50-32-8	Benzo(a)pyrene	0.042	U	0.021	0.042	0.052
205-99-2	Benzo(b)fluoranthene	0.042	U	0.021	0.042	0.052
191-24-2	Benzo(g,h,i)perylene	0.042	U	0.021	0.042	0.052
207-08-9	Benzo(k)fluoranthene	0.042	U	0.021	0.042	0.052
218-01-9	Chrysene	0.042	U	0.021	0.042	0.052
53-70-3	Dibenzo(a,h)anthracene	0.042	U	0.021	0.042	0.052
206-44-0	Fluoranthene	0.042	U	0.021	0.042	0.052
86-73-7	Fluorene	0.047	~~JB~~	0.021	0.042	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	U	0.021	0.042	0.052
91-20-3	Naphthalene	0.042 ~~0.032~~ U, MBL ~~JB~~		0.021	0.042	0.052
85-01-8	Phenanthrene	0.069	~~B~~	0.021	0.042	0.052
129-00-0	Pyrene	0.042	U	0.021	0.042	0.052

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW006-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706RE1 Lab File ID: 97706.D

Sample wt/vol: 965 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 0500

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.021	0.041	0.052
91-57-6	2-Methylnaphthalene	0.041	U	0.021	0.041	0.052
83-32-9	Acenaphthene	0.041	U	0.021	0.041	0.052
208-96-8	Acenaphthylene	0.041	U	0.021	0.041	0.052
120-12-7	Anthracene	0.041	U	0.021	0.041	0.052
56-55-3	Benzo(a)anthracene	0.041	U	0.021	0.041	0.052
50-32-8	Benzo(a)pyrene	0.041	U	0.021	0.041	0.052
205-99-2	Benzo(b)fluoranthene	0.041	U	0.021	0.041	0.052
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.021	0.041	0.052
207-08-9	Benzo(k)fluoranthene	0.041	U	0.021	0.041	0.052
218-01-9	Chrysene	0.041	U	0.021	0.041	0.052
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.021	0.041	0.052
206-44-0	Fluoranthene	0.041	U	0.021	0.041	0.052
86-73-7	Fluorene	0.041	U	0.021	0.041	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.021	0.041	0.052
91-20-3	Naphthalene	0.041	U	0.021	0.041	0.052
85-01-8	Phenanthrene	0.022	J	0.021	0.041	0.052
129-00-0	Pyrene	0.041	U	0.021	0.041	0.052

exclude RE

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707 Lab File ID: 97707.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 1501

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.021	0.041	0.052
91-57-6	2-Methylnaphthalene	0.041 ~~0.039~~ U,MPL ~~JB~~		0.021	0.041	0.052
83-32-9	Acenaphthene	0.041	U	0.021	0.041	0.052
208-96-8	Acenaphthylene	0.041	U	0.021	0.041	0.052
120-12-7	Anthracene	0.041	U	0.021	0.041	0.052
56-55-3	Benzo(a)anthracene	0.041	U	0.021	0.041	0.052
50-32-8	Benzo(a)pyrene	0.041	U	0.021	0.041	0.052
205-99-2	Benzo(b)fluoranthene	0.041	U	0.021	0.041	0.052
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.021	0.041	0.052
207-08-9	Benzo(k)fluoranthene	0.041	U	0.021	0.041	0.052
218-01-9	Chrysene	0.041	U	0.021	0.041	0.052
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.021	0.041	0.052
206-44-0	Fluoranthene	0.041	U	0.021	0.041	0.052
86-73-7	Fluorene	0.055 J,FD	~~B~~	0.021	0.041	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.021	0.041	0.052
91-20-3	Naphthalene	0.041 ~~0.038~~ U,MPL ~~JB~~		0.021	0.041	0.052
85-01-8	Phenanthrene	0.079 J,FD	~~B~~	0.021	0.041	0.052
129-00-0	Pyrene	0.041	U	0.021	0.041	0.052

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707RE1 Lab File ID: 97707.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 0529

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.021	0.041	0.052
91-57-6	2-Methylnaphthalene	0.041	U	0.021	0.041	0.052
83-32-9	Acenaphthene	0.041	U	0.021	0.041	0.052
208-96-8	Acenaphthylene	0.041	U	0.021	0.041	0.052
120-12-7	Anthracene	0.041	U	0.021	0.041	0.052
56-55-3	Benzo(a)anthracene	0.041	U	0.021	0.041	0.052
50-32-8	Benzo(a)pyrene	0.041	U	0.021	0.041	0.052
205-99-2	Benzo(b)fluoranthene	0.041	U	0.021	0.041	0.052
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.021	0.041	0.052
207-08-9	Benzo(k)fluoranthene	0.041	U	0.021	0.041	0.052
218-01-9	Chrysene	0.041	U	0.021	0.041	0.052
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.021	0.041	0.052
206-44-0	Fluoranthene	0.041	U	0.021	0.041	0.052
86-73-7	Fluorene	0.041	U	0.021	0.041	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.021	0.041	0.052
91-20-3	Naphthalene	0.041	U	0.021	0.041	0.052
85-01-8	Phenanthrene	0.026	J	0.021	0.041	0.052
129-00-0	Pyrene	0.041	U	0.021	0.041	0.052

exclude RE

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007R-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708 Lab File ID: 97708.D

Sample wt/vol: 975 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 1531

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.02	0.041	0.051
91-57-6	2-Methylnaphthalene	0.041 ~~0.022~~ ~~U, MBL~~ ~~JB~~		0.02	0.041	0.051
83-32-9	Acenaphthene	0.041	U	0.02	0.041	0.051
208-96-8	Acenaphthylene	0.041	U	0.02	0.041	0.051
120-12-7	Anthracene	0.041	U	0.02	0.041	0.051
56-55-3	Benzo(a)anthracene	0.041	U	0.02	0.041	0.051
50-32-8	Benzo(a)pyrene	0.041	U	0.02	0.041	0.051
205-99-2	Benzo(b)fluoranthene	0.041	U	0.02	0.041	0.051
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.02	0.041	0.051
207-08-9	Benzo(k)fluoranthene	0.041	U	0.02	0.041	0.051
218-01-9	Chrysene	0.041	U	0.02	0.041	0.051
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.02	0.041	0.051
206-44-0	Fluoranthene	0.041	U	0.02	0.041	0.051
86-73-7	Fluorene	0.041 ~~0.031~~ ~~U, MBL~~ ~~JB~~		0.02	0.041	0.051 UJ, FD
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.02	0.041	0.051
91-20-3	Naphthalene	0.041 ~~0.025~~ ~~U, MBL~~ ~~JB~~		0.02	0.041	0.051 ~~UJ, FD~~ U, MBL
85-01-8	Phenanthrene	0.047 ~~U, MBL~~ ~~JB~~		0.02	0.041	0.051 UJ, FD
129-00-0	Pyrene	0.041	U	0.02	0.041	0.051

4 corrections WW 04/12/11

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007R-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708RE1 Lab File ID: 97708.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 0559

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.041	U	0.021	0.041	0.052
91-57-6	2-Methylnaphthalene	0.041	U	0.021	0.041	0.052
83-32-9	Acenaphthene	0.041	U	0.021	0.041	0.052
208-96-8	Acenaphthylene	0.041	U	0.021	0.041	0.052
120-12-7	Anthracene	0.041	U	0.021	0.041	0.052
56-55-3	Benzo(a)anthracene	0.041	U	0.021	0.041	0.052
50-32-8	Benzo(a)pyrene	0.041	U	0.021	0.041	0.052
205-99-2	Benzo(b)fluoranthene	0.041	U	0.021	0.041	0.052
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.021	0.041	0.052
207-08-9	Benzo(k)fluoranthene	0.041	U	0.021	0.041	0.052
218-01-9	Chrysene	0.041	U	0.021	0.041	0.052
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.021	0.041	0.052
206-44-0	Fluoranthene	0.041	U	0.021	0.041	0.052
86-73-7	Fluorene	0.041	U	0.021	0.041	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.021	0.041	0.052
91-20-3	Naphthalene	0.041	U	0.021	0.041	0.052
85-01-8	Phenanthrene	0.024	J	0.021	0.041	0.052
129-00-0	Pyrene	0.041	U	0.021	0.041	0.052

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709 Lab File ID: 97709.D

Sample wt/vol: 955 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 1600

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
90-12-0	1-Methylnaphthalene	0.042	U	0.021	0.042	0.052
91-57-6	2-Methylnaphthalene	0.026	JB	0.021	0.042	0.052
83-32-9	Acenaphthene	0.042	U	0.021	0.042	0.052
208-96-8	Acenaphthylene	0.042	U	0.021	0.042	0.052
120-12-7	Anthracene	0.042	U	0.021	0.042	0.052
56-55-3	Benzo(a)anthracene	0.042	U	0.021	0.042	0.052
50-32-8	Benzo(a)pyrene	0.042	U	0.021	0.042	0.052
205-99-2	Benzo(b)fluoranthene	0.042	U	0.021	0.042	0.052
191-24-2	Benzo(g,h,i)perylene	0.042	U	0.021	0.042	0.052
207-08-9	Benzo(k)fluoranthene	0.042	U	0.021	0.042	0.052
218-01-9	Chrysene	0.042	U	0.021	0.042	0.052
53-70-3	Dibenzo(a,h)anthracene	0.042	U	0.021	0.042	0.052
206-44-0	Fluoranthene	0.042	U	0.021	0.042	0.052
86-73-7	Fluorene	0.035	JB	0.021	0.042	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	U	0.021	0.042	0.052
91-20-3	Naphthalene	0.032	JB	0.021	0.042	0.052
85-01-8	Phenanthrene	0.052	B	0.021	0.042	0.052
129-00-0	Pyrene	0.042	U	0.021	0.042	0.052

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020311RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709RE1 Lab File ID: 97709.D

Sample wt/vol: 950 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 0628

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.042	U	0.021	0.042	0.053
91-57-6	2-Methylnaphthalene	0.033	J	0.021	0.042	0.053
83-32-9	Acenaphthene	0.042	U	0.021	0.042	0.053
208-96-8	Acenaphthylene	0.042	U	0.021	0.042	0.053
120-12-7	Anthracene	0.042	U	0.021	0.042	0.053
56-55-3	Benzo(a)anthracene	0.042	U	0.021	0.042	0.053
50-32-8	Benzo(a)pyrene	0.042	U	0.021	0.042	0.053
205-99-2	Benzo(b)fluoranthene	0.042	U	0.021	0.042	0.053
191-24-2	Benzo(g,h,i)perylene	0.042	U	0.021	0.042	0.053
207-08-9	Benzo(k)fluoranthene	0.042	U	0.021	0.042	0.053
218-01-9	Chrysene	0.042	U	0.021	0.042	0.053
53-70-3	Dibenzo(a,h)anthracene	0.042	U	0.021	0.042	0.053
206-44-0	Fluoranthene	0.042	U	0.021	0.042	0.053
86-73-7	Fluorene	0.042	U	0.021	0.042	0.053
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	U	0.021	0.042	0.053
91-20-3	Naphthalene	0.089		0.021	0.042	0.053
85-01-8	Phenanthrene	0.042	U	0.021	0.042	0.053
129-00-0	Pyrene	0.042	U	0.021	0.042	0.053

exclude RE

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701 Lab File ID: 977-01.D

Sample wt/vol: 965 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 10 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/16/11 Time: 2003

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.0039	0.0079	0.052
72-20-8	Endrin	0.0037	U	0.0019	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0019	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.19	0.37	0.52

4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702 Lab File ID: 977-02.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 10 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/16/11 Time: 2021

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.052
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.052
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.52

41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705 Lab File ID: 977-05.D

Sample wt/vol: 975 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 10 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/16/11 Time: 2114

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.051
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.051
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.051
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.051
76-44-8	Heptachlor	0.0081	U	0.0041	0.0081	0.051
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.051
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.051
959-98-8	Endosulfan I	0.0088	U	0.0044	0.0088	0.051
60-57-1	Dieldrin	0.0055	U	0.0028	0.0055	0.051
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.051
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.051
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.051
72-54-8	4,4'-DDD	0.0053	U	0.0027	0.0053	0.051
1031-07-8	Endosulfan sulfate	0.002	U	0.001	0.002	0.051
50-29-3	4,4'-DDT	0.0022	U	0.0011	0.0022	0.051
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.051
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.051
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.051
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.051
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.051
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.51

41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706 Lab File ID: 977-06.D

Sample wt/vol: 965 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 10 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/16/11 Time: 2132

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.0039	0.0079	0.052
72-20-8	Endrin	0.0037	U	0.0019	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0019	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.19	0.37	0.52

JDC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707 Lab File ID: 977-07.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 10 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/16/11 Time: 2149

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.052
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.052
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.52

41571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007R-0211 P

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708 Lab File ID: 77-08.D

Sample wt/vol: 960 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 10 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1030

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0017	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.009	U	0.0045	0.009	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.004	0.0079	0.052
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0017	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.52

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709 Lab File ID: 77-09.D

Sample wt/vol: 940 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 10 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1048

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0064	U	0.0032	0.0064	0.053
319-85-7	beta-BHC	0.0026	U	0.0013	0.0026	0.053
319-86-8	delta-BHC	0.0064	U	0.0032	0.0064	0.053
58-89-9	gamma-BHC (Lindane)	0.0051	U	0.0026	0.0051	0.053
76-44-8	Heptachlor	0.0084	U	0.0042	0.0084	0.053
309-00-2	Aldrin	0.0034	U	0.0017	0.0034	0.053
1024-57-3	Heptachlor epoxide	0.003	U	0.0015	0.003	0.053
959-98-8	Endosulfan I	0.0091	U	0.0046	0.0091	0.053
60-57-1	Dieldrin	0.0057	U	0.0029	0.0057	0.053
72-55-9	4,4'-DDE	0.0081	U	0.004	0.0081	0.053
72-20-8	Endrin	0.0025	J	0.0019	0.0038	0.053
33213-65-9	Endosulfan II	0.0034 MJ2C ~~JP~~	U	0.0017	0.0034	0.053
72-54-8	4,4'-DDD	0.0029 MJ2C ~~JP~~	U	0.0028	0.0055	0.053
1031-07-8	Endosulfan sulfate	0.0026	J	0.0011	0.0021	0.053
50-29-3	4,4'-DDT	0.0076	J	0.0012	0.0023	0.053
72-43-5	Methoxychlor	0.0027 MJ2C ~~JP~~	U	0.0019	0.0038	0.053
7421-93-4	Endrin aldehyde	0.0022	J	0.0016	0.0032	0.053
5103-74-2	gamma-Chlordane	0.0051	U	0.0026	0.0051	0.053
5103-71-9	alpha-Chlordane	0.0064	U	0.0032	0.0064	0.053
53494-70-5	Endrin ketone	0.013	U	0.0064	0.013	0.053
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.53

XBcon DAC 4/7/11

JBC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701 Lab File ID: 977-01.D

Sample wt/vol: 975 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 2 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1639

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.02	U	0.015	0.02	0.02
11096-82-5	Aroclor-1260	0.02	U	0.01	0.02	0.02
11104-28-2	Aroclor-1221	0.02	U	0.018	0.02	0.02
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.02
53469-21-9	Aroclor-1242	0.02	U	0.013	0.02	0.02
12672-29-6	Aroclor-1248	0.011	U	0.0053	0.011	0.02
11097-69-1	Aroclor-1254	0.0098	U	0.0049	0.0098	0.02

41571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702 Lab File ID: 977-02.D

Sample wt/vol: 975 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 2 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1725

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.02	U	0.015	0.02	0.02
11096-82-5	Aroclor-1260	0.02	U	0.01	0.02	0.02
11104-28-2	Aroclor-1221	0.02	U	0.018	0.02	0.02
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.02
53469-21-9	Aroclor-1242	0.02	U	0.013	0.02	0.02
12672-29-6	Aroclor-1248	0.011	U	0.0053	0.011	0.02
11097-69-1	Aroclor-1254	0.0098	U	0.0049	0.0098	0.02

JMC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

090311 1733

Form I

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705 Lab File ID: 977-05.D

Sample wt/vol: 975 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 2 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1810

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.02	U	0.015	0.02	0.02
11096-82-5	Aroclor-1260	0.02	U	0.01	0.02	0.02
11104-28-2	Aroclor-1221	0.02	U	0.018	0.02	0.02
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.02
53469-21-9	Aroclor-1242	0.02	U	0.013	0.02	0.02
12672-29-6	Aroclor-1248	0.011	U	0.0053	0.011	0.02
11097-69-1	Aroclor-1254	0.0098	U	0.0049	0.0098	0.02

JWC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706 Lab File ID: 977-06.D

Sample wt/vol: 965 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 2 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1825

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0083	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.01	U	0.005	0.01	0.021

41571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

090311 1733

Form I

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707 Lab File ID: 977-07.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 2 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1840

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

41571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

090311 1733

Form I

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007R-0211 P

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code: PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708 Lab File ID: 977-08.D

Sample wt/vol: 970 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 2 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1855

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

Results reported on Primary Column, if RPD >40% results flagged accordingly.

090311 1733

Form I

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709 Lab File ID: 977-09.D

Sample wt/vol: 940 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 2 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1910

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.011	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.017	U	0.0085	0.017	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0055	0.011	0.021
11097-69-1	Aroclor-1254	0.01	U	0.0051	0.01	0.021

JMC 41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~1630~~	J	R SD	P	186	372	2000
7440-39-3	Barium	7.06	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U ~~U~~	~~UJ~~	P	2.4	4.8	73
7440-70-2	Calcium	419000		J SD	P	780	1560	2000
7439-89-6	Iron	392	J	J MSH	P	110	220	800
7439-95-4	Magnesium	1310000		J SD	P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.0411	J	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	433000			P	1430	2870	10000
7782-49-2	Selenium	164	J	UJ MSL	P	82	164	180
7440-28-0	Thallium	121	J		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

XI corr JAC 4/9/11

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW003-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11100000			P	9000	15000	15000

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~875~~	~~J~~	~~R NE SD~~	P	186	372	2000
7440-39-3	Barium	16.1	J	N	P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U	N	P	2.4	4.8	73
7440-70-2	Calcium	523000		J ~~E~~ SD	P	780	1560	2000
7439-89-6	Iron	813		J N MSH	P	110	220	800
7439-95-4	Magnesium	1360000		J ~~E~~ SD	P	196	392	2000
7439-96-5	Manganese	14	U	N	P	7	14	200
7439-97-6	Mercury	0.074	~~U~~	UJ N MSLCV		0.037	0.074	0.2
7440-02-0	Nickel	37.2	U	N	P	18.6	37.2	82
7440-09-7	Potassium	544000			P	1430	2870	10000
7782-49-2	Selenium	164	~~U~~	UJN MSLP		82	164	180
7440-28-0	Thallium	176	U	N	P	88	176	200
7440-62-2	Vanadium	17.6	U	N	P	8.8	17.6	180
7440-66-6	Zinc	160	U	N	P	80	160	400

JAC 4/14/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW004-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	15900000			P	18000	30000	30000

JAC 4/14/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~698~~	R J	SD	P	186	372	2000
7440-39-3	Barium	13.7	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	489000		J SD	P	780	1560	2000
7439-89-6	Iron	590	J	J MSH	P	110	220	800
7439-95-4	Magnesium	1180000		J SD	P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.074	J	UJ MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	510000			P	1430	2870	10000
7782-49-2	Selenium	164	J	UJ MSL	P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

JLC 4/14/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW005-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11500000			P	9000	15000	15000

4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~559~~	~~J~~	R SD	P	186	372	2000
7440-39-3	Barium	7.67	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	498000		J SD	P	780	1560	2000
7439-89-6	Iron	220	U		P	110	220	800
7439-95-4	Magnesium	1360000		J SD	P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.074	~~J~~	UJ MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	512000			P	1430	2870	10000
7782-49-2	Selenium	164	~~J~~	UJ MSL	P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW006-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11300000			P	9000	15000	15000

4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

060311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~315~~ ~~372~~ R SD J		~~H~~ ~~MSL~~	P	186	372	2000
7440-39-3	Barium	5.74	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	462000		J SD	P	780	1560	2000
7439-89-6	Iron	220	U		P	110	220	800
7439-95-4	Magnesium	1260000		J SD	P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.074	~~U~~	UJ MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	476000			P	1430	2870	10000
7782-49-2	Selenium	164	~~U~~	UJ MSL	P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10600000			P	18000	30000	30000

JAC 4/14/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007R-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: *UG/L*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~324~~ 372 R	SD J	H MSL	P	186	372	2000
7440-39-3	Barium	5.42	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	464000		J SD	P	780	1560	2000
7439-89-6	Iron	220	U		P	110	220	800
7439-95-4	Magnesium	1160000		J SD	P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.074	~~U~~	UJ MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	480000			P	1430	2870	10000
7782-49-2	Selenium	164	~~U~~	UJ MSL	P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007R-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10800000			P	18000	30000	30000

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

690911 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	18.6	U		P	9.3	18.6	100
7440-39-3	Barium	0.44	U		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	78	U		P	39	78	100
7439-89-6	Iron	11	U		P	5.5	11	40
7439-95-4	Magnesium	19.6	U		P	9.8	19.6	100
7439-96-5	Manganese	0.7	U		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.86	U		P	0.93	1.86	4.1
7440-09-7	Potassium	143	U		P	71.7	143	500
7782-49-2	Selenium	8.2	U		P	4.1	8.2	9
7440-23-5	Sodium	186	J		P	180	300	300
7440-28-0	Thallium	8.8	U		P	4.4	8.8	10
7440-62-2	Vanadium	0.88	U		P	0.44	0.88	9
7440-66-6	Zinc	8	U		P	4	8	20

jac
4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1734

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	1220	J		P	186	372	2000
7440-39-3	Barium	7.58	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	418000			P	780	1560	2000
7439-89-6	Iron	220	U		P	110	220	800
7439-95-4	Magnesium	1320000			P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.074	~~J~~ UJ MSL		CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	438000			P	1430	2870	10000
7782-49-2	Selenium	164	U		P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW003-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11000000		JMOP	P	9000	15000	15000

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	1740	J	~~N~~	P	186	372	2000
7440-39-3	Barium	19.6	J	~~N~~	P	4.4	8.8	200
7440-41-7	Beryllium	~~2.97~~ 4.8	J	U ~~N~~ MDL	P	2.4	4.8	73
7440-70-2	Calcium	419000			P	780	1560	2000
7439-89-6	Iron	293	J	~~N~~	P	110	220	800
7439-95-4	Magnesium	1280000			P	196	392	2000
7439-96-5	Manganese	14	U	~~N~~	P	7	14	200
7439-97-6	Mercury	0.0439	J	J MDL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U	~~N~~	P	18.6	37.2	82
7440-09-7	Potassium	436000			P	1430	2870	10000
7782-49-2	Selenium	164	U	~~N~~	P	82	164	180
7440-23-5	Sodium	~~10900000~~	exclude DL		P	3600	6000	6000
7440-28-0	Thallium	176	U	~~N~~	P	88	176	200
7440-62-2	Vanadium	17.6	U	~~N~~	P	8.8	17.6	180
7440-66-6	Zinc	160	U	~~N~~	P	80	160	400

41571

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW004-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10800000		J / NDP	P	18000	30000	30000

41571

Color Before: Clarity Before: Texture :

Color After : Clarity After: Artifacts:

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	387	J		P	186	372	2000
7440-39-3	Barium	15.5	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	484000			P	780	1560	2000
7439-89-6	Iron	~~127~~ 230	J	U MDL	P	110	220	800
7439-95-4	Magnesium	1080000			P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.0474	J	J MDL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	498000			P	1430	2870	10000
7782-49-2	Selenium	164	U		P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

JAC 41571

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW005-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11000000		J MDP	P	9000	15000	15000

JMC 41571

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

000311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	1450	J		P	186	372	2000
7440-39-3	Barium	8.79	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	416000			P	780	1560	2000
7439-89-6	Iron	220	U		P	110	220	800
7439-95-4	Magnesium	1290000			P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.074	~~U~~ UJ MSL		CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	435000			P	1430	2870	10000
7782-49-2	Selenium	164	U		P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

JLC 41511

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW006-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10700000		J MDP	P	9000	15000	15000

JMC 4/5/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~1230~~	~~J~~	R FD	P	186	372	2000
7440-39-3	Barium	6.48	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	409000			P	780	1560	2000
7439-89-6	Iron	220	U		P	110	220	800
7439-95-4	Magnesium	1290000			P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.074	~~U~~	LCJ MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	428000			P	1430	2870	10000
7782-49-2	Selenium	164	U		P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

XI Corr JAC 41811

JAC 41511

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10900000		J MDP	P	9000	15000	15000

JMC 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007R-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

JAC 4/5/11 P

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	372	U	R FD	P	186	372	2000
7440-39-3	Barium	5.92	J		P	4.4	8.8	200
7440-41-7	Beryllium	4.8	U		P	2.4	4.8	73
7440-70-2	Calcium	465000			P	780	1560	2000
7439-89-6	Iron	220	U		P	110	220	800
7439-95-4	Magnesium	1200000			P	196	392	2000
7439-96-5	Manganese	14	U		P	7	14	200
7439-97-6	Mercury	0.074	U	UJ MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	37.2	U		P	18.6	37.2	82
7440-09-7	Potassium	470000			P	1430	2870	10000
7782-49-2	Selenium	164	U		P	82	164	180
7440-28-0	Thallium	176	U		P	88	176	200
7440-62-2	Vanadium	17.6	U		P	8.8	17.6	180
7440-66-6	Zinc	160	U		P	80	160	400

X1 corr JRC 4/19/11

JAC 4/15/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007R-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708DL1

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

JAC 41511

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10700000		J MDP	P	9000	15000	15000

JAC 41511

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	18.6	U		P	9.3	18.6	100
7440-39-3	Barium	0.44	U		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	78	U		P	39	78	100
7439-89-6	Iron	11	U		P	5.5	11	40
7439-95-4	Magnesium	19.6	U		P	9.8	19.6	100
7439-96-5	Manganese	0.7	U		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.86	U		P	0.93	1.86	4.1
7440-09-7	Potassium	143	U		P	71.7	143	500
7782-49-2	Selenium	8.2	U		P	4.1	8.2	9
7440-23-5	Sodium	183	J		P	180	300	300
7440-28-0	Thallium	8.8	U		P	4.4	8.8	10
7440-62-2	Vanadium	0.88	U		P	0.44	0.88	9
7440-66-6	Zinc	8	U		P	4	8	20

JMC 4/5/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1735

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-EB01-020311

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Matrix (soil/water): WATER Lab Sample ID: K0201-07

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.78	~~B~~	~~N~~ J	MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.5	U	~~N~~	MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	0.48	~~B~~	~~N~~ J	MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.094	~~B~~	J	MS	0.024	0.20	1.0
7440-50-8	Copper	0.5	U		MS	0.23	0.50	5.0
7439-92-1	Lead	0.097	~~B~~	J	MS	0.068	0.20	1.0
7440-22-4	Silver	0.05	U		MS	0.022	0.050	1.0

4/5/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW003-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Matrix (soil/water): WATER Lab Sample ID: K0201-01

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	10.3	~~B~~ N	J	MS	10.0	10.0	100
7440-38-2	Arsenic	25 ~~22.2~~	~~B~~ N	U MBL	MS	9.5	25.0	100
7440-43-9	Cadmium	10	U		MS	4.2	10.0	50.0
7440-47-3	Chromium	50	U	J	MS	8.0	50.0	100
7440-48-4	Cobalt	10	U		MS	1.2	10.0	50.0
7440-50-8	Copper	25	U		MS	12.0	25.0	250
7439-92-1	Lead	10 ~~6.2~~	~~B~~	U MBL	MS	3.4	10.0	50.0
7440-22-4	Silver	2.5	U		MS	1.1	2.5	50.0

JAC 4/5/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW004-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Matrix (soil/water): WATER Lab Sample ID: K0201-02

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U	N	MS	100	100	1000
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	N	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20 ~~9.3~~	~~B~~	U MBL	MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JAC 4/5/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW005-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Matrix (soil/water): WATER Lab Sample ID: K0201-03

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U	N	MS	20.0	20.0	200
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500	U	N	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20 ~~9.0~~	~~B~~ U	MBL	MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JMC 04/15/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW006-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Matrix (soil/water): WATER Lab Sample ID: K0201-04

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U	M	MS	100	100	1000
7440-38-2	Arsenic	250 ~~115~~	~~B~~ N	U MDL	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	M	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

QC 41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW007-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Matrix (soil/water): WATER Lab Sample ID: K0201-05

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U	N	MS	100	100	1000
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	N	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

41571

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW007R-0211 P

QAC 41611

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Matrix (soil/water): WATER Lab Sample ID: K0201-06

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U	N	MS	100	100	1000
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	N	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

QAC 41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-EB01-020311

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Matrix (soil/water): WATER Lab Sample ID: K0201-07

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.68	~~B~~ ~~N~~	J	MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.5	U	~~N~~	MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	0.36	~~B~~ ~~N~~	J	MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.031	~~B~~	J	MS	0.024	0.20	1.0
7440-50-8	Copper	0.40	~~B~~	J	MS	0.23	0.50	5.0
7439-92-1	Lead	0.2	U		MS	0.068	0.20	1.0
7440-22-4	Silver	0.031	~~B~~	J	MS	0.022	0.050	1.0

4571

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW003-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Matrix (soil/water): WATER Lab Sample ID: K0201-01

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	10	U	N	MS	10.0	10.0	100
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	10	U		MS	4.2	10.0	50.0
7440-47-3	Chromium	500	U	N	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	10	U		MS	3.4	10.0	50.0
7440-22-4	Silver	2.5	U		MS	1.1	2.5	50.0

41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW004-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Matrix (soil/water): WATER Lab Sample ID: K0201-02

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U	~~M~~	MS	100	100	1000
7440-38-2	Arsenic	250 ~~102~~	~~B N~~ U MBL		MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	~~M~~	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JMC 4/5/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW005-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Matrix (soil/water): WATER Lab Sample ID: K0201-03

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U	N	MS	20.0	20.0	200
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	N	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JWC 41571

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW006-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Matrix (soil/water): WATER Lab Sample ID: K0201-04

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U	~~N~~	MS	100	100	1000
7440-38-2	Arsenic	250 ~~95.6~~	~~B~~ N	U MBL	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	~~N~~	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JAC 4/5/11

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW007-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Matrix (soil/water): WATER Lab Sample ID: K0201-05

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U	N	MS	100	100	1000
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	N	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JAC
41571

Comments:

ISM_002

FORM I - IN

SW846

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW007R-0211

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Matrix (soil/water): WATER Lab Sample ID: K0201-06

Level (low/med): MED Date Received: 02/04/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U	~~N~~	MS	100	100	1000
7440-38-2	Arsenic	~~250~~ ~~111~~	~~B~~ ~~N~~ U MDL		MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	~~N~~	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

MC 41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.035			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1736

VW 041211

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.021			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1736

VM 04/12/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.041			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

000311 1736

WW 04/12/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.012			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1736

WW 04/12/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.012			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1736

WW 041211

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No. P
VWW06-SW007R-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.022			SP	0.0035	0.007	0.01

J, HT

Color Before: Clarity Before: Texture :

Color After : Clarity After: Artifacts:

Comments:

090311 1736

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

UJ, HT

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1736

WW 04/12/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197701

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.012			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1736

VW 04/12/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197702

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.013			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1736

2/4/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197705

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.014			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1736

VWS 04/21/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197706

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.013			SP	0.0035	0.007	0.01

J, H7

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

090311 1736

WW 2/4/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197707

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: *MG/L*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.009	J		SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

000311 1736

VW 2/4/11

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No. VWW06-SW007R-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197708

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.008	J		SP	0.0035	0.007	0.01

J, HT

Color Before: Clarity Before: Texture :

Color After : Clarity After: Artifacts:

Comments:

090311 1736

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	J		SP	0.0035	0.007	0.01

J,HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

090311 1736

2/4/11

PEL

A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3501977

Page 1 of 2

NB

Special Handling:
TAT- Indicate Date Needed: _____
· All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
· Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni / WDC
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
703-376-5111, michael.zamboni@ch2m.com
Project Mgr.: Bill Hannan / VBO

Invoice To: _____
P.O. No.: _____ RQN: _____

Project No.: 402244-F1.SW.06 CTO 111
Site Name: SWMU 6
Location: Vieques, PR State: PR
Sampler(s): Dennis Ballam / John Martin

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9= ice only 10= _____ 11= _____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1= _____ X2= _____ X3= _____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: VOCs	PAHs	Pest/PCBs	Metals	F Metals	QA/QC Reporting Level
	~~VWWJ6-SW001-0211~~	~~2/3/11 DE~~				~~3~~	~~5~~		~~6~~	~~x~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	
	~~VWWJ6-SW002-0211~~	~~2/3/11 DE~~				~~3~~	~~5~~		~~6~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	
-01	VWWJ6-SW003-0211	2/3/11	~~1045~~ 1045			3	5		6	✓	✓	✓	✓	✓	
-02-03-04	VWWJ6-SW004-0211	2/3/11	~~0815~~ 0815			9	15		18	✓	✓	✓	✓	✓	
-05	VWWJ6-SW005-0211	2/3/11	~~0640~~ 0640			3	5		6	✓	✓	✓	✓	✓	
-06	VWWJ6-SW006-0211	2/3/11	~~0930~~ 0930			3	5		6	✓	✓	✓	✓	✓	double amber
-07	VWWJ6-SW007-0211	2/3/11	~~1010~~ 1010			3	5		6	✓	✓	✓	✓	✓	received
-08	VWWJ6-SW008-0211	2/3/11	~~1010~~ 1010			3	5		6	✓	✓	✓	✓	✓	1010 OL, 7.3.3.202,
-09	VWAE ~~VWWJ6~~-EB01-0203	2/3/11	0630			3	5		6	✓	✓	✓	✓	✓	and 7.3.4.202
-10	VWAE-TB01-0203	2/3/11	1130			3				✓					sent to mitken

☐ E-mail to temp 1.6, 2.2, 3.6, 2.9, 4.1, 3.6,
EDD Format 5.8, 4.3 pltx2 8260, 6010, 6010D, 6020, 6020D 6030 and 6030D sent to mitken

Condition upon receipt: ☒ Iced ☐ Ambient ☒ °C _____

Relinquished by:	Received by:	Date:	Time:
	Mit	2-4-11	855

3501977

112 1108

PEL

A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3501977

Page 2 of 2

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni/WPC
Michael.Zamboni@cham.com
703-376-5111
15010 Conference Center Dr 200
Chantilly, VA 20151
Project Mgr.: ~~Bill~~ Bill Hannah/VBO

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 0402244.F1.SW.006
Site Name: SWMU6
Location: VIEQUES ~~PR~~ State: PR
Sampler(s): John Martin/Dennis Ballam

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8=$NaHSO_4$ 9=ICE ONLY 10=_____ 11=_____

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	List preservative code below: 2 9 9 4 4	Analyses: SW8260B VOCs	SW8270C_SIM PAHs	SW8082 PCBs	SW6010B Metals	SW7470A Mercury	TCLP Metals	TCLP	Notes:
-11	VWW06-B301-022211	2/2/11	1000		SO			3									✓	

QA/QC Reporting Level
☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____

State specific reporting standards: _____

☐ E-mail to _____
EDD Format _____

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

Relinquished by:	Received by:	Date:	Time:
		2-4-11	855

International Air Waybill

Origin Copy

ss

12/03/11 Sender's FedEx Account Number

Jan Coste Phone 757-...-6686

5700 ... St.

State Province VA

USA ZIP Postal Code 23462

John Heyman Phone 813 333-1500

RL Labs Sample Receiving

3105 ... St.

Dept./Floor

Sample Receiving

Tampa State Province FL

USA ZIP Postal Code 33634

ID Number for Customs Purposes
EIN/ABN, or as locally required.

formation ☐ For EU Only: Tick here if goods are not in free circulation and provide C.I.

1 Total Weight 50 lbs. ☒ kg ☐ DIM L / W / H in. ☐ cm ☐

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
Sample		USA	NCV

AES? ☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR. | Total Declared Value for Carriage | Total Value for Customs (Specify Currency) NCV

exemption number: If other than NLR, enter License Exception:

filing citation:

4 Express Package Service — *Packages up to 150 lbs./68 kg* — *For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.*

1 ☒ FedEx Intl. Priority 6 ☐ FedEx Intl. First — Available to select locations. Higher rates apply.

☐ ______ 3 ☐ FedEx Intl. Economy — FedEx Envelope and FedEx Pak rate not available.

Not all services and options are available to all destinations. Dangerous goods cannot be shipped using this Air Waybill.

5 Packaging — *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.*

1 ☐ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube

☒ Other cooler PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling

1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery — *Available to select locations for FedEx Intl. Priority only.*

7a Payment *Bill transportation charges to:* — Enter FedEx Acct. No. or Credit Card No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 4 ☐ Credit Card 5 ☐ Cash Check/Cheque

FedEx Acct. No. 186713208 [redacted]

Total Transportation

Credit Card Exp. Date — Specify Currency

7b Payment *Bill duties and taxes to:* — ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash Check/Cheque

FedEx Acct. No. 186713208

8 Your Internal Billing Reference — First 24 characters will appear on invoice.

404422. FISW56

9 Required Signature — Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

521

PART 156410 Rev. Date 4/06 ©1994-2006 FedEx PRINTED IN U.S.A.

FedEx Tracking Number 8628 2125 8001 0402 Form ID No.

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FAJA	TPF	XJ TPF	Total Volume (cm)

Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station — Forms Attached: ☐ CI ☐ CO

Base Charge — Declared Val. Chrg. — Other — ODA/OPA — Credit Card Auth.

FedEx Emp. # — Audit Emp. # — Date — Time — Del. Courier Emp. # — Date — Time

Non-Negotiable International Air Waybill • ©1994–2006 FedEx

FedEx International Air Waybill

ress

Origin Copy

12/03/11 Sender's FedEx Account Number

Jake Crosthe' Phone 757 671 6786

CHM Hill

5700 Cleveland St

Suite 101

Virginia Beach State Province VA

USA ZIP Postal Code 23462

John Heyman Phone 813 888 9507

PEL Labs - Sample Receiving

8455 Largemore Rd Dept/Floor

Suite A

Tampa State Province FL

USA ZIP Postal Code 33634

Tax ID Number for Customs Purposes
TIN/EIN/ABN, or as locally required.

Information For EU Only: Tick here if goods are not in free circulation and provide C.I.

ges 1 Total Weight 50 lbs. kg DIM L / W / H in. cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
Sample		USA	0

ed in AES? No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR. Total Declared Value for Carriage 0.00 Total Value for Customs (Specify Currency) 0.00

If other than NLR, enter License Exception:

d, enter exception number:

oof of filing citation:

4 Express Package Service

Packages up to 150 lbs. / 68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 FedEx Intl. Priority 6 FedEx Intl. First Available to select locations. Higher rates apply.

3 FedEx Intl. Economy FedEx Envelope and FedEx Pak rate not available.

Not all services and options are available to all destinations. Dangerous goods cannot be shipped using this Air Waybill.

5 Packaging *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

1 FedEx Envelope 2 FedEx Pak 3 FedEx Box 4 FedEx Tube

Other cooler PW FedEx 10kg Box* PX FedEx 25kg Box*

6 Special Handling

1 HOLD at FedEx Location 3 SATURDAY Delivery Available to select locations for FedEx Intl. Priority only.

7a Payment Bill transportation charges to:

Enter FedEx Acct. No. or Credit Card No. below.

1 Sender Acct. No. in Section 1 will be billed. 2 Recipient 3 Third Party 1867718208 4 Credit Card 5 Cash Check/ Cheque

FedEx Acct. No. [redacted] Total Transportation

Credit Card Exp. Date Specify Currency

7b Payment Bill duties and taxes to:

ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 Sender Acct. No. in Section 1 will be billed. 2 Recipient 3 Third Party 1867718208 5 Cash Check/Cheque

FedEx Acct. No.

8 Your Internal Billing Reference First 24 characters will appear on invoice.

4044422. FI SW SC

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department license or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

521

PART 158410 Rev. Date 4/09 ©1994-2006 FedEx PRINTED IN U.S.A.

FedEx Tracking Number 8607 5366 7831 0402

Form ID No.

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FNJA	TPF	XJTPA	Total Volume (cm)

Received At: 1 Reg. Stop 2 On-Call Stop 3 Drop Box 4 World Service Center 5 Station Forms Attached: CI CO

Date/ Time 1210 Declared Val. Chrg. Other ODA/ OPA Credit Card Auth.

FedEx Emp. # Audit Emp. # Date Time Del. Courier Emp. # Date Time

Non-Negotiable International Air Waybill • ©1994-2006 FedEx

115

3501977 1111

3. International Air Waybill

SS

7/03/10 Sender's FedEx Account Number

JAKL Crosstc. Phone 757 67 - 6286

CHPll

5700 Cleveland St

Suite 101

Virginia Beach State Province VA

USA ZIP Postal Code 23462

John Heyman Phone 313 888 7507

PFL ... Temple ...

3405 ... Rd

Dept./Floor

Suite A

Tampa State Province FL

USA ZIP Postal Code

ID Number for Customs Purposes

VAT/ABN, or as locally required.

Information

For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Weight 50 lbs. [x] kg [ ] DIM L / W / H in. [ ] cm [ ]

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
water		USA	NCV

EST [ ] No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

Exemption number:

If other than NLR, enter License Exception:

...g citation:

Total Declared Value for Carriage: NCV

Total Value for Customs (Specify Currency): NCV

Origin Copy

4 Express Package Service

Packages up to 150 lbs. / 68 kg
For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

[x] FedEx Intl. Priority

6 [ ] FedEx Intl. First
Available to select locations. Higher rates apply.

[ ] ______

3 [ ] FedEx Intl. Economy
FedEx Envelope and FedEx Pak rate not available.

Not all services and options are available to all destinations. Dangerous goods cannot be shipped using this Air Waybill.

5 Packaging

*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 [ ] FedEx Envelope 2 [ ] FedEx Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube

[x] Other cooler PW [ ] FedEx 10kg Box* PX [ ] FedEx 25kg Box*

6 Special Handling

1 [ ] HOLD at FedEx Location 3 [ ] SATURDAY Delivery
Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:*

Enter FedEx Acct. No. or Credit Card No. below.

1 [ ] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [x] Third Party 4 [ ] Credit Card 5 [ ] Cash Check/Cheque

136718208

FedEx Acct. No. [redacted]

Total Transportation

Credit Card Exp. Date

Specify Currency

7b Payment *Bill duties and taxes to:*

ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 [ ] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [x] Third Party 5 [ ] Cash Check/Cheque

FedEx Acct. No. 136718208

8 Your Internal Billing Reference First 24 characters will appear on invoice.

404122. FI SW S6

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

521

PART 156410
Rev. Date 4/06
©1994-2006 FedEx
PRINTED IN U.S.A.

SRY

FedEx Tracking Number 8628 2125 7987 0402

Form ID No.

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FNJA	TPF	XJ TPF	Total Volume (cm)

Received At: 1 [ ] Reg. Stop 2 [x] On-Call Stop 3 [ ] Drop Box 4 [ ] World Service Center 5 [ ] Station

Forms Attached: [ ] CI [ ] CO

Base Charges / Declared Val. Chrg. / Other / DDA/OPA / Credit Card Auth.

FedEx Emp. # 10870 Audit Emp. # Date Time Del. Courier Emp. # Date Time

Non-Negotiable International Air Waybill • ©1994-2006 FedEx

FedEx. International Air Waybill
Express

PACKAGE LABEL — COMMERCIAL INVOICE LABEL — DELIVERY RECORD LABEL — DELIVERY REATTEMPT LABEL

1 From

Date 2/3/11 Sender's FedEx Account Number

Sender's Name JAKE Crosthc Phone 352 671 6285

Company CH2M Hill

Address 5400 Cleveland St

Address Suite 121

City Virginia Beach State Province VA

Country USA ZIP Postal Code 23462

2 To

Recipient's Name John Heyman Phone 813 888-9507

Company PEL Labs - Sample Receiving

Address 8455 Fergerson Dr. Dept/Floor

Address Suite A

City Tampa State Province FL

Country USA ZIP Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g. GST/RFC/VAT/IN/EIN/ABN, or as locally required.

3 Shipment Information

☐ For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 ☒ lbs. ☐ kg DIM L / W / H ☐ in. ☐ cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
Sample		USA	NCV ✓

Has EEI/SED been filed in AES? For U.S. Export Only: Check One
☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.
☐ No EEI/SED required, enter exemption number:
☐ Yes – Enter AES proof of filing citation:
If other than NLR, enter License Exception:

Total Declared Value for Carriage: NCV

Total Value for Customs (Specify Currency): NCV

4 Express Package Service — Packages up to 150 lbs. / 68 kg
For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 ☒ FedEx Intl. Priority
6 ☐ FedEx Intl. First — Available to select locations. Higher rates apply.
3 ☐ FedEx Intl. Economy — FedEx Envelope and FedEx Pak rate not available.

5 Packaging — *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☐ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube
1 ☒ Other Sample PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling

1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery — Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:*

Enter FedEx Acct. No. or Credit Card No. below.
1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 4 ☐ Credit Card 5 ☐ Cash Check/ Cheque

FedEx Acct. No. 1867 18208 Total Transportation

Credit Card Exp. Date Specify Currency

7b Payment *Bill duties and taxes to:* ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.
1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash Check/Cheque

FedEx Acct. No. 1867 18208

8. Your Internal Billing Reference — First 24 characters will appear on invoice.

404422.EI SW56

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:
This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

FedEx Tracking Number 8628 2125 8012 0402

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FNSO	TPA	XX TA	Total Volu

Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station — Forms Attached:

Basic Charges: 19.00 — Declared Val. Chrg. — Other — COD/ DPA — Credit Card Auth.

FedEx Emp. # — Audit Emp. # — Date — Time — Del. Courier Emp. # — Date

Non-Negotiable International A

FedEx Express International Air Waybill

PACKAGE LABEL — COMMERCIAL INVOICE LABEL — DELIVERY RECORD LABEL — DELIVERY REATTEMPT LABEL

1 From

Date 02/03/11 — Sender's FedEx Account Number

Sender's Name Jan. Cloutier — Phone 757-671-6286

Company PDM, Inc

Address 3 Cleveland St

Address Suite 201

City Virginia Beach — State/Province VA

Country USA — ZIP/Postal Code 23462

2 To

Recipient's Name Dan Heyman — Phone 813 888-7537

Company PLL Labs — Sample Receiving

Address 3405 Benjamin Rd — Dept/Floor

Address Suite A

City Tampa — State/Province FL

Country USA — ZIP/Postal Code 34

Recipient's Tax ID Number for Customs Purposes
e.g., GST/RFC/VAT/IN/EIN/ABN, or as locally required.

3 Shipment Information

Total Packages (Shipper's Load and Count/SLAC) 1

Total Weight 50 [x] lbs [ ] kg — DIM L / W / H [ ] in. [x] cm

☐ For EU Duty: Tick here if goods are not in free circulation and provide C.I.

Commodity Description (DETAIL REQUIRED)	Harmonized Code	Country of Manufacture	Value for Customs (REQUIRED)
sample		USA	NCV
			0

Has EEI/SED been filed in AES? (For U.K. Export Only: Check One)
☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.
☐ No EEI/SED required, enter exemption number:
☐ Yes – Enter AES proof of filing citation:
If other than NLR, enter License Exception:

Total Declared Value for Carriage: USD

Total Value for Customs (Specify Currency): USD

4 Express Package Service — *Packages up to 150 lbs. / 68 kg*
For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 [x] FedEx Intl. Priority — 5 ☐ FedEx Intl. First (Available to select locations. Higher rates apply.)
☐ ____ — 3 ☐ FedEx Intl. Economy (FedEx Envelope and FedEx Pak rate not available.)

5 Packaging — *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 [x] FedEx Envelope — 2 ☐ FedEx Pak — 3 ☐ FedEx Box — 4 ☐ FedEx Tube
1 [x] Other tools — PW ☐ FedEx 10kg Box* — PX ☐ FedEx 25kg Box*

6 Special Handling
1 ☐ HOLD at FedEx location — 3 ☐ SATURDAY Delivery (Available to select locations for FedEx Intl. Priority only.)

7a Payment *Bill transportation charges to:*
Enter FedEx Acct. No. or Credit Card No. below.
1 ☐ Sender (Acct. No. in Section 1 will be billed.) — 2 ☐ Recipient — 3 [x] Third Party — 4 ☐ Credit Card — 5 ☐ Cash/Check/Cheque
FedEx Acct. No. [redacted] 196718208
Credit Card Exp. Date — Total Transportation Charges — Specify Currency

7b Payment *Bill duties and taxes to:* (ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.)
Enter FedEx Acct. No. below.
1 ☐ Sender (Acct. No. in Section 1 will be billed.) — 2 ☐ Recipient — 3 [x] Third Party — 5 ☐ Cash/Check/Cheque
FedEx Acct. No. 196718208

8 Your Internal Billing Reference (First 24 characters will appear on invoice.)
PDM.022.FI.SW.SG

9 Required Signature
Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay as described in the Conditions of Contract.
WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.
Sender's Signature:
This is not authorization to deliver this shipment without a recipient signature.
Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as listed on the reverse side of the Recipient's Copy.
Recipient's Signature:

FedEx Tracking Number 8628 2125 7976 0402

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FNSA	TPA	NTPA	Total Volume

Received At: 1 ☐ Reg. Stop — 2 [x] On-Call Stop — 3 ☐ Drop Box — 4 ☐ World Service Center — 5 ☐ Station — Forms Attached:

Basic Charges — Declared Val. Chrg. — Other — COA/OFA — Credit Card Auth.
FedEx Emp. # — Audit Emp. # — Date — Time — Del. Courier Emp. # — Date

Non-Negotiable International Air Wa

PACKAGE LABEL — COMMERCIAL INVOICE LABEL — DELIVERY RECORD LABEL — DELIVERY REATTEMPT LABEL

FedEx Express International Air Waybill

Orig

1 From

Date 02/03/11 Sender's FedEx Account Number

Sender's Name JAKE . CIOSTIC Phone (757) 671-6[illegible]

Company CHI 21 Hill

Address 1700 Cleveland St

Address Suite 101

City Virginia Beach State/Province VA

Country USA ZIP/Postal Code 23462

2 To

Recipient's Name John Heyman Phone 813-398-9507

Company FCL Labs - Sample Receiving

Address 8405 Benjamin Rd Dept/Floor

Address Suite A

City Tampa State/Province FL

Country USA ZIP/Postal Code 33634

Recipient's Tax ID Number for Customs Purposes (e.g. GST/RFC/VAT/IN/EIN/ABN, or as locally required)

3 Shipment Information

For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 53 lbs. kg DIM L / W / H in. cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
Samples		USA	NCV
			0

Has EEI/SED been filed in AES? For U.S. Export Only: Check One

☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

☐ No EEI/SED required, enter exemption number: If other than NLR, enter License Exception:

☐ Yes – Enter AES proof of filing citation:

Total Declared Value for Carriage: USD

Total Value for Customs (Specify Currency): NCV

Express Package Service

Packages up to 150 lbs./68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 ☒ FedEx Intl. Priority 6 ☐ FedEx Intl. First (Available to select locations. Higher rates apply.)

3 ☐ FedEx Intl. Economy (FedEx Envelope and FedEx Pak rate not available.)

Not all service options to all destinations. Dangerous goods cannot be shipped via Air Waybill.

5 Packaging *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☒ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube

1 ☐ Other [illegible] PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling

1 ☐ HOLD at FedEx Location 3 ☒ SATURDAY Delivery (Available to select locations for FedEx Intl. Priority only.)

7a Payment *Bill transportation charges to:*

Enter FedEx Acct. No. or Credit Card No. below.

1 ☐ Sender (Acct. No. in Section 1 will be billed.) 2 ☐ Recipient 3 ☒ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check/Cheque

FedEx Acct. No. 186718208

Credit Card Exp. Date Total Transportation Specify Currency

7b Payment *Bill duties and taxes to:* ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 ☐ Sender (Acct. No. in Section 1 will be billed.) 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash/Check/Cheque

FedEx Acct. No. 186718208

8 Your Internal Billing Reference First 24 characters will appear on invoice.

404422 . FI SW. SG

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature: [signature]

This is not authorization to deliver this shipment without recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

FedEx Tracking Number 8607 5366 7820 0402

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FAJA	PIT	XJTPT	Total Volume (cm)

Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station — Forms Attached: ☐

Rate Charges 70.70 Declared Val. Charg. Other ODA/DPA Credit Card Auth.

FedEx Emp. # Audit Emp. # Date Time Del. Courier Emp. # Date

Non-Negotiable International Air Waybill

PAR Rev. ©19 PRI Form ID N

FedEx Express International Air Waybill

Origin

1 From

Date 2/3/11 Sender's FedEx Account Number

Sender's Name Jake Crostic Phone 757 671 6286

Company CH2M Hill

Address 5700 Cleveland St

Address Suite 101

City Virginia Beach State Province VA

Country USA ZIP Postal Code 23462

2 To

Recipient's Name John Heyman Phone 813-839-9507

Company PEL Labs - Female Recovery

Address 3405 Longwood Rd Dept/Floor

Address Suite A

City Tampa State Province FL

Country USA ZIP Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g. GST/RFC/VAT/IN/EIN/ABN, or as locally required.

3 Shipment Information

For EU Duty: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 lbs. kg DIM L / W / H in. cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
Samples		USA	NVD

Has EEI/SED been filed in AES? For U.S. Export Only: Check One
- ☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.
- ☐ No EEI/SED required, enter exemption number: If other than NLR, enter License Exception:
- ☐ Yes – Enter AES proof of filing citation:

Total Declared Value for Carriage: USD 0

Total Value for Customs (Specify Currency): USD 0

4 Express Package Service

Packages up to 150 lbs. / 68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

- 1 ☒ FedEx Intl. Priority
- 6 ☐ FedEx Intl. First — Available to select locations. Higher rates apply.
- ☐ ____ 3 ☐ FedEx Intl. Economy — FedEx Envelope and FedEx Pak rate not available.

5 Packaging

*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

- 6 ☑ FedEx Envelope
- 2 ☐ FedEx Pak
- 3 ☐ FedEx Box
- 4 ☐ FedEx Tube
- 1 ☒ Other cooler
- PW ☐ FedEx 10kg Box*
- PX ☐ FedEx 25kg Box*

6 Special Handling

- 1 ☐ HOLD at FedEx Location
- 3 ☐ SATURDAY Delivery — Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:*

Enter FedEx Acct. No. or Credit Card No. below.

- 1 ☐ Sender Acct. No. in Section 1 will be billed.
- 2 ☒ Recipient
- 3 ☐ Third Party
- 4 ☐ Credit Card
- 5 ☐ Cash Check/Cheque

FedEx Acct. No. 136718208 Total Transportation

Credit Card Exp. Date Currency

7b Payment *Bill duties and taxes to:*

ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

- 1 ☐ Sender Acct. No. in Section 1 will be billed.
- 2 ☐ Recipient
- 3 ☒ Third Party
- 5 ☐ Cash Check/Cheque

FedEx Acct. No. 136718208

8 Your Internal Billing Reference First 24 characters will appear on invoice.

104422. FI SW 56

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

52

PART 1984 Rev. Date 4 ©1994–200 PRINTED I

FedEx Tracking Number 8628 2125 8023 0402

Form ID No.

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FAJX	TPF	XXTPF	Total Volume (cm)

Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station — Forms Attached: ☐ CI

Base Charges: 0.00 — Declared Val. Chrg. — Other — ODA/OPA — Credit Card Auth.

FedEx Emp. # — Audit Emp. # — Date — Time — Del. Courier Emp. # — Date — Time

Non-Negotiable International Air Waybill • ©19

3501977

120 1116

FedEx Express *International Air Waybill*

1 From

Date 2/3/11 — Sender's FedEx Account Number

Sender's Name: Carl Closs... — Phone 757 671 6286

Company: CH2M HILL

Address: 5700 Cleveland St

Address: Suite 101

City: Virginia Beach — State/Province: VA

Country: USA — ZIP/Postal Code: 23462

2 To

Recipient's Name: ... — Phone 813 888 9507

Company: PEL Labs Sample Receiving

Address: 9405 ... Rd — Dept./Floor

Address: Suite A

City: Tampa — State/Province: FL

Country: USA — ZIP/Postal Code: 33634

Recipient's Tax ID Number for Customs Purposes
e.g. GST/RFC/VAT/IN/EIN/ABN, or as locally required.

3 Shipment Information — ☐ For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC): 1 — Total Weight: 50 — ☒ lbs. ☐ kg — DIM L / W / H — ☐ in. ☐ cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
samples		USA	NCV
			0

Has EEI/SED been filed in AES? For U.S. Export Only: Check One — ☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR. — Total Declared Value for Carriage: NCV(?) — Total Value for Customs (Specify Currency): NCV

☐ No EEI/SED required, enter exemption number: — If other than NLR, enter License Exception:

☐ Yes – Enter AES proof of filing citation:

4 Express Package Service — *Packages up to 150 lbs. / 68 kg* — For packages over 150 lbs. (68 kg), use the FedEx Expedited Service Intl. Air Waybill.

1 ☒ FedEx Intl. Priority — 6 ☐ FedEx Intl. First (Available to select locations. Higher rates apply.)

☐ ______ — 3 ☐ FedEx Intl. Economy (FedEx Envelope and FedEx Pak rate not available.)

5 Packaging — *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☐ FedEx Envelope — 2 ☐ FedEx Pak — 3 ☐ FedEx Box — 4 ☐ FedEx Tube

☒ Other: cooler — PW ☐ FedEx 10kg Box* — PX ☐ FedEx 25kg Box*

6 Special Handling

1 ☐ HOLD at FedEx Location — 3 ☐ SATURDAY Delivery (Available to select locations for FedEx Intl. Priority only.)

7a Payment *Bill transportation charges to:*

1 ☐ Sender (Acct. No. in Section 1 will be billed.) — 2 ☐ Recipient — 3 ☒ Third Party — 4 ☐ Credit Card — 5 ☐ Cash Check/Cheque (Enter FedEx Acct. No. or Credit Card No. below.)

FedEx Acct. No. [redacted] — Total Transportation

Credit Card Exp. Date — Specify Currency

7b Payment *Bill duties and taxes to:* — ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

1 ☐ Sender (Acct. No. in Section 1 will be billed.) — 2 ☐ Recipient — 3 ☒ Third Party — 5 ☐ Cash Check/Cheque (Enter FedEx Acct. No. below.)

FedEx Acct. No. 196418288

8 Your Internal Billing Reference — First 24 characters will appear on invoice.

404422 FI SW356

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

FedEx Tracking Number: 8628 2125 7998 0402

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FAJA	TPA	XJ TPF	

Received At: 1 ☐ Reg. Stop — 2 ☒ On-Call Stop — 3 ☐ Drop Box — 4 ☐ World Service Center — 5 ☐ Station — Forms Attached: ☐ — Total Volume (cm)

Base Charges — Declared Val. Chrg. — Other — ODA/OPA — Credit Card Auth.
FedEx Emp. # — Audit Emp. # — Date — Time — Del. Courier Emp. # — Date

Non-Negotiable International Air Waybill

Orig...

PACKAGE LABEL — COMMERCIAL INVOICE LABEL — DELIVERY RECORD LABEL — DELIVERY REATTEMPT LABEL

121

PEL, a Division of Spectrum Analytical, Inc.

pH LOG SHEET

Work Order # 3501977 By NA

Client / Project Name ~~Sw~~ CH2M Hill / Vieques / Swmu6 / 402244-FLSW.06 CTO 111 Date 2-4-11

ns 2-4-11

PEL Sample Number	H_2SO_4 (pH<2)		HNO_3 (pH<2) 6010, 60108 60200		NaOH (pH>12)		ZnAC/NaOH (pH>9)		HCl (pH<2) 8260		Other ____ pH ____	
	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH
01			4	<2					3	<2		
02			↓	↓					↓	↓		
03												
04												
05												
06												
07												
08												
09			↓	↓								
10									↓	↓		
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

3501977

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	3501977	**Req:**	90619
Client:	CH2M Hill	**Project:**	CTO-083 / CTO-111 SWMU 6
Level:	4	**Date Rec'd:**	2/4/2011 8:55:00 AM
Rec'd via:	Fed-Ex	**Due Date:**	2/18/2011

Sample Verification

Samples/Cooler Secure?	Yes	**All Samples on COC accounted For?**	Yes
Temperature of Samples(Celsius)	1.6C-5.8C	**All Samples Rec'd Intact?**	Yes
pH Verified?	Yes	**Sample Vol. Sufficient For Analysis**	Yes
pH WNL?	Yes	**Samples Rec'd W/I Hold Time?**	Yes
Soil Origin (Domestic/Foreign):	Foreign	**Are All Samples to be Analyzed?**	Yes
Site Location/Project on COC?	Yes	**Correct Sample Containers?**	Yes
Client Project # on COC?	Yes	**COC Comments written on COC?**	Yes
Project Mgr. Indicated on COC?	Yes	**Samplers Initials on COC?**	Yes
COC relinquished/Dated by Client?	Yes	**Sample Date/Time Indicated?**	Yes
COC Received/Dated by PEL?	Yes	**TAT Requested:**	STD
Specific Subcontract Indicated?	No	**Client Requests Verbal Results?**	No
Samples Received By	Fed-Ex	**Client Requests Faxed Results?**	No
PEL to Conduct ALL Analyses?	No	**Specific tests noted on COC**	
Radioactivity Check?	No		
COC Present?	Yes		

PEER REVIEW _____

Client: CH2M Hill

WONo: 3501977 Profile Name: Vieques Profile #: 90619

MATRIX S

Sample #	Bottle	Parameter	Check	Received	Date
11	002	6010_TCLP TCLP Metals by 1311/6010	In	Nicole Labus	2/4/2011 2:04:50 PM
11	001	6010_TCLP TCLP Metals by 1311/6010	Out	Gerson Galvis	2/7/2011 6:48:12 AM
11	001	6010_TCLP TCLP Metals by 1311/6010	In	Gerson Galvis	2/7/2011 1:55:47 PM
11	004	6010_TCLP TCLP Metals by 1311/6010	In	Gerson Galvis	2/8/2011 8:09:44 AM
11	004	6010_TCLP TCLP Metals by 1311/6010	Out	Gerson Galvis	2/8/2011 8:11:18 AM
11	004	6010_TCLP TCLP Metals by 1311/6010	In	Gerson Galvis	2/8/2011 12:58:50 PM
11	002	7470_TCLP 7470 TCLP Mercury	In	Nicole Labus	2/4/2011 2:04:51 PM
11	001	7470_TCLP 7470 TCLP Mercury	Out	Gerson Galvis	2/7/2011 6:48:12 AM
11	001	7470_TCLP 7470 TCLP Mercury	In	Gerson Galvis	2/7/2011 1:55:48 PM
11	004	7470_TCLP 7470 TCLP Mercury	In	Gerson Galvis	2/8/2011 8:09:44 AM
11	004	7470_TCLP 7470 TCLP Mercury	Out	Gerson Galvis	2/8/2011 8:11:18 AM
11	004	7470_TCLP 7470 TCLP Mercury	In	Gerson Galvis	2/8/2011 12:58:53 PM
11	002	8081_TCLP Pestcides TCLP	In	Nicole Labus	2/4/2011 2:04:53 PM
11	001	8081_TCLP Pestcides TCLP	Out	Gerson Galvis	2/7/2011 6:48:12 AM
11	001	8081_TCLP Pestcides TCLP	In	Gerson Galvis	2/7/2011 1:55:50 PM
11	006	8081_TCLP Pestcides TCLP	In	Gerson Galvis	2/8/2011 8:10:05 AM
11	006	8081_TCLP Pestcides TCLP	Consumed	Christelle Abadia	2/8/2011 8:16:23 AM
11	001	8082 PCB	In	Nicole Labus	2/4/2011 2:05:05 PM
11	002	8082 PCB	Out	Frank Colosi	2/7/2011 8:20:45 AM
11	002	8082 PCB	In	Frank Colosi	2/7/2011 12:51:36 PM
11	002	8151_TCLP Herbicides TCLP	In	Nicole Labus	2/4/2011 2:04:54 PM
11	001	8151_TCLP Herbicides TCLP	Out	Gerson Galvis	2/7/2011 6:48:12 AM
11	001	8151_TCLP Herbicides TCLP	In	Gerson Galvis	2/7/2011 1:55:51 PM
11	007	8151_TCLP Herbicides TCLP	In	Gerson Galvis	2/8/2011 8:10:12 AM
11	007	8151_TCLP Herbicides TCLP	Consumed	Christelle Abadia	2/8/2011 8:16:30 AM
11	002	8260_TCLP Volatiles in Soil by 1311/8260	In	Nicole Labus	2/4/2011 2:04:54 PM

11	001	8260_TCLP	Volatiles in Soil by 1311/8260	Out	Gerson Galvis	2/7/2011 6:48:12 AM
11	001	8260_TCLP	Volatiles in Soil by 1311/8260	In	Gerson Galvis	2/7/2011 1:55:52 PM
11	008	8260_TCLP	Volatiles in Soil by 1311/8260	In	Gerson Galvis	2/8/2011 8:10:58 AM
11	008	8260_TCLP	Volatiles in Soil by 1311/8260	Consumed	Marcell Stephens	2/23/2011 6:58:33 AM
11	002	8270_TCLP	TCLP Semivolatiles by 8270	In	Nicole Labus	2/4/2011 2:04:54 PM
11	001	8270_TCLP	TCLP Semivolatiles by 8270	Out	Gerson Galvis	2/7/2011 6:48:12 AM
11	001	8270_TCLP	TCLP Semivolatiles by 8270	In	Gerson Galvis	2/7/2011 1:55:52 PM
11	005	8270_TCLP	TCLP Semivolatiles by 8270	In	Gerson Galvis	2/8/2011 8:09:57 AM
11	005	8270_TCLP	TCLP Semivolatiles by 8270	Consumed	Christelle Abadia	2/8/2011 8:16:19 AM
11	001	9045	Corosivity - pH	In	Nicole Labus	2/4/2011 2:05:06 PM
11	001	9045	Corosivity - pH	Out	Gerson Galvis	2/7/2011 6:48:12 AM
11	001	9045	Corosivity - pH	In	Gerson Galvis	2/7/2011 1:55:53 PM
11	001	Dry Weight	Dry Weight	In	Nicole Labus	2/4/2011 2:05:07 PM
11	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/7/2011 6:48:12 AM
11	001	Dry Weight	Dry Weight	In	Sylvia Lukasiewicz	2/7/2011 3:44:20 PM

WONo: 3501977 Profile Name: Vieques Profile #: 90619

MATRIX W

Sample #	Bottle	Parameter		Check	Received	Date
01	008	6010	Metals	In	Nicole Labus	2/4/2011 2:01:29 PM
01	008	6010	Metals	Out	Gerson Galvis	2/7/2011 6:45:53 AM
01	008	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:29 PM
01	007	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:01:55 PM
01	007	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:46:59 AM
01	007	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:05 PM
01	001	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:27:44 AM
01	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:54:12 AM
01	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:40 PM
01	010	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:27 AM
01	010	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:55:17 AM
01	010	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:13 PM
01	008	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
01	008	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:45:53 AM
01	008	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:32 PM
01	007	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:54:00 AM
01	007	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:37:30 AM
01	007	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:28 PM
01	004	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:21 PM
01	012	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:25 PM
01	003	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:39:22 AM
01	003	8082L	PCB	In	Nicole Labus	2/4/2011 5:03:54 PM
01	005	8082L	PCB	Consumed	Christelle Abadia	2/7/2011 7:40:58 AM
01	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:19 PM
01	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:21 PM
01	014	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:22 PM
01	013	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:02:29 AM
01	005	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:06 PM

01	002	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:09 PM
01	002	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:40:26 AM
01	012	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:15:14 PM
02	007	6010	Metals	In	Nicole Labus	2/4/2011 2:01:27 PM
02	007	6010	Metals	Out	Gerson Galvis	2/7/2011 6:45:58 AM
02	007	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:34 PM
02	008	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:01:52 PM
02	008	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:47:02 AM
02	008	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:10 PM
02	009	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:27:50 AM
02	009	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:54:24 AM
02	009	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:44 PM
02	003	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:25 AM
02	003	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:54:51 AM
02	003	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:25 PM
02	007	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
02	007	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:45:58 AM
02	007	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:34 PM
02	008	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:54:00 AM
02	008	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:37:34 AM
02	008	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:30 PM
02	001	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:26 PM
02	006	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:27 PM
02	002	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:39:01 AM
02	002	8082L	PCB	In	Nicole Labus	2/4/2011 5:03:59 PM
02	005	8082L	PCB	Consumed	Christelle Abadia	2/7/2011 7:41:03 AM
02	014	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:24 PM
02	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:25 PM
02	012	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:27 PM
02	013	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 7:57:52 AM

02	005	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:10 PM
02	004	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:11 PM
02	004	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:40:21 AM
02	006	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:15:19 PM
03	003	6010	Metals	In	Nicole Labus	2/4/2011 2:01:28 PM
03	003	6010	Metals	Out	Gerson Galvis	2/7/2011 6:46:03 AM
03	003	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:36 PM
03	011	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:01:49 PM
03	011	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:47:05 AM
03	011	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:13 PM
03	009	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:27:52 AM
03	009	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:54:09 AM
03	009	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:47 PM
03	005	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:23 AM
03	005	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:55:22 AM
03	005	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:22 PM
03	003	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
03	003	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:46:03 AM
03	003	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:36 PM
03	011	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:55:00 AM
03	011	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:37:37 AM
03	011	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:32 PM
03	002	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:28 PM
03	006	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:30 PM
03	004	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:39:06 AM
03	004	8082L	PCB	In	Nicole Labus	2/4/2011 5:04:01 PM
03	008	8082L	PCB	Consumed	Christelle Abadia	2/7/2011 7:41:09 AM
03	012	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:28 PM
03	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:29 PM
03	014	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:30 PM

03	014	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 7:52:45 AM
03	013	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 7:52:48 AM
03	007	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:12 PM
03	008	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:13 PM
03	007	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:40:16 AM
03	002	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:15:24 PM
04	009	6010	Metals	In	Nicole Labus	2/4/2011 2:01:30 PM
04	009	6010	Metals	Out	Gerson Galvis	2/7/2011 6:46:08 AM
04	009	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:37 PM
04	004	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:01:57 PM
04	004	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:47:08 AM
04	004	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:14 PM
04	014	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:27:53 AM
04	014	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:53:51 AM
04	014	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:49 PM
04	008	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:22 AM
04	008	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:55:19 AM
04	008	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:27 PM
04	009	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
04	009	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:46:08 AM
04	009	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:37 PM
04	004	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:55:00 AM
04	004	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:37:42 AM
04	004	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:33 PM
04	007	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:32 PM
04	002	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:34 PM
04	001	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:39:12 AM
04	001	8082L	PCB	In	Nicole Labus	2/4/2011 5:04:03 PM
04	010	8082L	PCB	Consumed	Christelle Abadia	2/7/2011 7:40:52 AM
04	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:31 PM

04	012	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:32 PM
04	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:33 PM
04	013	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 7:52:54 AM
04	012	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 7:52:58 AM
04	010	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:14 PM
04	003	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:15 PM
04	009	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:40:05 AM
04	002	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:15:28 PM
05	002	6010	Metals	In	Nicole Labus	2/4/2011 2:01:25 PM
05	002	6010	Metals	Out	Gerson Galvis	2/7/2011 6:46:12 AM
05	002	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:38 PM
05	004	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:02:00 PM
05	004	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:47:11 AM
05	004	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:15 PM
05	010	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:27:55 AM
05	010	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:54:15 AM
05	010	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:51 PM
05	001	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:16 AM
05	001	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:55:09 AM
05	001	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:29 PM
05	002	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
05	002	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:46:12 AM
05	002	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:38 PM
05	004	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:55:00 AM
05	004	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:37:46 AM
05	004	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:35 PM
05	013	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:33 PM
05	014	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:50 PM
05	012	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:39:17 AM
05	012	8082L	PCB	In	Nicole Labus	2/4/2011 5:04:04 PM

05	012	8082L	PCB	Consumed	Russell Stallone	2/14/2011 3:23:31 PM
05	006	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:35 PM
05	008	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:37 PM
05	007	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:39 PM
05	008	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:02:33 AM
05	009	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:16 PM
05	003	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:19 PM
05	003	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:40:06 AM
05	009	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:40:11 AM
05	013	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:15:10 PM
06	003	6010	Metals	In	Nicole Labus	2/4/2011 2:01:32 PM
06	003	6010	Metals	Out	Gerson Galvis	2/7/2011 6:46:19 AM
06	003	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:40 PM
06	009	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:01:58 PM
06	009	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:47:14 AM
06	009	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:17 PM
06	014	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:27:56 AM
06	014	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:54:35 AM
06	014	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:53 PM
06	008	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:18 AM
06	008	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:55:00 AM
06	008	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:31 PM
06	003	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
06	003	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:46:19 AM
06	003	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:40 PM
06	009	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:55:00 AM
06	009	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:37:50 AM
06	009	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:36 PM
06	002	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:35 PM

06	001	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:37 PM
06	004	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:38:40 AM
06	004	8082L	PCB	In	Nicole Labus	2/4/2011 5:04:06 PM
06	005	8082L	PCB	Consumed	Christelle Abadia	2/7/2011 7:40:47 AM
06	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:09:02 PM
06	012	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:09:04 PM
06	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:09:05 PM
06	012	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:02:36 AM
06	010	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:20 PM
06	005	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:21 PM
06	010	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:39:49 AM
06	002	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:15:06 PM
07	011	6010	Metals	In	Nicole Labus	2/4/2011 2:01:36 PM
07	011	6010	Metals	Out	Gerson Galvis	2/7/2011 6:46:24 AM
07	011	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:41 PM
07	007	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:01:43 PM
07	007	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:47:18 AM
07	007	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:18 PM
07	009	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:28:00 AM
07	009	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:54:32 AM
07	009	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:55 PM
07	001	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:19 AM
07	001	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:55:06 AM
07	001	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:36 PM
07	011	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
07	011	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:46:24 AM
07	011	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:41 PM
07	007	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:55:00 AM
07	007	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:37:54 AM
07	007	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:37 PM

07	004	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:38 PM
07	002	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:41 PM
07	006	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:38:46 AM
07	006	8082L	PCB	In	Nicole Labus	2/4/2011 5:04:08 PM
07	003	8082L	PCB	Consumed	Christelle Abadia	2/7/2011 7:40:42 AM
07	012	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:58 PM
07	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:59 PM
07	014	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:09:00 PM
07	013	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:02:40 AM
07	003	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:24 PM
07	005	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:25 PM
07	005	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:39:44 AM
07	002	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:15:02 PM
08	007	6010	Metals	In	Nicole Labus	2/4/2011 2:01:33 PM
08	007	6010	Metals	Out	Gerson Galvis	2/7/2011 6:46:29 AM
08	007	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:43 PM
08	010	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:01:46 PM
08	010	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:47:21 AM
08	010	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:20 PM
08	014	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:27:59 AM
08	014	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:54:29 AM
08	014	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:57 PM
08	009	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:20 AM
08	009	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:55:12 AM
08	009	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:34 PM
08	007	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
08	007	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:46:29 AM
08	007	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:43 PM
08	010	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:55:00 AM
08	010	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:37:59 AM

08	010	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:38 PM
08	006	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:44 PM
08	003	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:45 PM
08	005	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:38:51 AM
08	005	8082L	PCB	In	Nicole Labus	2/4/2011 5:04:10 PM
08	008	8082L	PCB	Consumed	Christelle Abadia	2/7/2011 7:40:36 AM
08	001	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:51 PM
08	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:53 PM
08	012	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:56 PM
08	013	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:02:44 AM
08	001	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/16/2011 5:23:24 AM
08	008	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:22 PM
08	002	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:27 PM
08	002	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:39:38 AM
08	003	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:14:57 PM
09	009	6010	Metals	In	Nicole Labus	2/4/2011 2:01:35 PM
09	009	6010	Metals	Out	Gerson Galvis	2/7/2011 6:46:35 AM
09	009	6010	Metals	In	Gerson Galvis	2/7/2011 1:53:44 PM
09	007	6010_D	Dissolved Metals	In	Nicole Labus	2/4/2011 2:01:47 PM
09	007	6010_D	Dissolved Metals	Out	Gerson Galvis	2/7/2011 6:47:24 AM
09	007	6010_D	Dissolved Metals	In	Gerson Galvis	2/7/2011 1:54:22 PM
09	014	7196A	Hex Chrom	In	Nicole Labus	2/4/2011 11:27:58 AM
09	014	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/4/2011 11:54:20 AM
09	014	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/4/2011 3:09:59 PM
09	006	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/4/2011 11:28:14 AM
09	006	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/4/2011 11:55:15 AM
09	006	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/4/2011 3:10:39 PM
09	009	7470	Mercury	In	Nicole Labus	2/4/2011 11:55:00 AM
09	009	7470	Mercury	Out	Gerson Galvis	2/7/2011 6:46:35 AM

09	009	7470	Mercury	In	Gerson Galvis	2/7/2011 1:53:44 PM
09	007	7470_D	Mercury dissolved	In	Nicole Labus	2/4/2011 11:55:00 AM
09	007	7470_D	Mercury dissolved	Out	Gerson Galvis	2/8/2011 10:38:03 AM
09	007	7470_D	Mercury dissolved	In	Gerson Galvis	2/8/2011 12:58:40 PM
09	002	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:42 PM
09	004	8081	Pesticides	In	Nicole Labus	2/4/2011 5:29:47 PM
09	005	8081	Pesticides	Consumed	Christelle Abadia	2/7/2011 7:38:56 AM
09	005	8082L	PCB	In	Nicole Labus	2/4/2011 5:04:12 PM
09	001	8082L	PCB	Consumed	Christelle Abadia	2/7/2011 7:40:31 AM
09	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:46 PM
09	012	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:48 PM
09	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:50 PM
09	012	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:02:48 AM
09	008	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:26 PM
09	001	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/4/2011 5:34:30 PM
09	008	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/7/2011 7:39:33 AM
09	002	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 12:14:52 PM
10	003	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:41 PM
10	002	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:43 PM
10	001	8260	Volatile Organic Compounds	In	Nicole Labus	2/4/2011 1:08:45 PM
10	002	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:02:52 AM

Addendum

090311 1736

Letter of Acceptance

Customer Name:	CH2M Hill
Date and Time Received:	2/4/2011 8:55:00 AM
Date to be Reported:	2/28/2011
Laboratory Submission Number/SDG:	3501977
Get Detailed Analyte List here:	www.pelab.com/webdms/Default.asp?LoaSDG=3501977
Project:	Vieques/SWMU 6/402244.FI.SW.06 CTO 11

Samples: The submission consisted of 11 samples, including QC, with sample identification shown in the attached data tables.

Tests: The Samples will be analyzed for EPA methods: 1010OL, 6010, 6010_D, 6010_TCLP, 6020_D_OL, 6020OL, 7.3.3.2OL , 7.3.4.2OL , 7196A, 7196A_D, 7470, 7470_D, 7470_TCLP, 8081, 8081_TCLP, 8082, 8082L, 8151_TCLP, 8260, 8260_TCLP, 8270_SIM, 8270_TCLP, 9045.

Sample Custody/COC discrepancies:

None.

Notes:

Samples for 6020, Ignitability, Reactive Cyanide, and Reactive Sulfide analysis will be performed by Mitkem.

Distribution of Report to:

CH2M Hill
Attn: Michael Zamboni
(W): 703.376.5301

Note: Submitted material will be retained for 30 days unless otherwise requested by client or consumed in analysis. PEL letters and reports are for the exclusive use of the client to whom they are addressed. Our letters and reports apply to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar materials

1

Log-in Report

Level: 4

Total of: 121 analyses on 27 samples (including QC) *10-Feb-11*

Report/SDG #: 3501977

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW003-0211	350197701		W	2/3/2011 10:45:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

Report/SDG #: 3501977

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW004-0211	350197702		W	2/3/2011 8:15:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW004-0211MS	350197703		W	2/3/2011 8:15:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

Report/SDG #: 3501977

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW004-0211SD	350197704		W	2/3/2011 8:15:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW005-0211	350197705		W	2/3/2011 6:40:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

Report/SDG #: 3501977

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW006-0211	350197706		W	2/3/2011 9:30:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW007-0211	350197707		W	2/3/2011 10:10:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

Report/SDG #: 3501977

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW007R-0211	350197708		W	2/3/2011 10:10:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWAE-EB01-020311	350197709		W	2/3/2011 6:30:00 AM	2/4/2011 8:55:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

Report/SDG #: 3501977

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWAE-TB01-020311	350197710		W	2/3/2011 11:30:00 AM	2/4/2011 8:55:00 AM

Method		
8260	Volatile Organic Compounds	8260

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-IS01-020211	350197711		S	2/2/2011 10:00:00 AM	2/4/2011 8:55:00 AM

Method		
1010OL	Flashpoint	1010
6010_TCLP	TCLP Metals by 1311/6010	6010
7.3.3.2OL	Cyanide, Reactive	7.3.3.2
7.3.4.2OL	Sulfide, Reactive	7.3.4.2
7470_TCLP	7470 TCLP Mercury	7470
8081_TCLP	Pestcides TCLP	8081
8082	PCB	8082
8151_TCLP	Herbicides TCLP	8151
8260_TCLP	Volatiles in Soil by 1311/8260	8260
8270_TCLP	TCLP Semivolatiles by 8270	8270
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight

John Heyman [PEL]

From: Vickie.Weber@ch2m.com
Sent: Wednesday, February 09, 2011 5:17 PM
To: John Heyman [PEL]; Michael.Zamboni@CH2M.com
Subject: Vieques SWMU 6 corrections memo
Attachments: CTF_020911_vw.pdf

Hello John,

Please look at the attached corrections memo for updates to the COCs for the samples from Vieques SWMU 6.

Let me know if you have any questions.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 07, 2011 3:23 PM
To: Brynildsen, Victoria/VBO; Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Good to go.
Thanks!
John

From: Vickie.Weber@ch2m.com [mailto:Vickie.Weber@ch2m.com]
Sent: Monday, February 07, 2011 3:22 PM
To: Michael.Zamboni@CH2M.com; John Heyman [PEL]
Subject: RE: LOA and COC for Vieques SWMU 6

Ok...

Sorry about the confusion. The water samples are from 2/3/11 and the field team just wanted me to note that the filtered metals were field filtered as they forgot to include a note about that on the COC.

Let me know if you still have questions.

Vickie

From: Zamboni, Michael/WDC
Sent: Monday, February 07, 2011 3:05 PM
To: Brynildsen, Victoria/VBO; John Heyman [PEL]
Cc: Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Hi Vickie,

Can you please clarify this email? On 2/4/11, there should only be one aqueous sample (besides the trip blank) and it is an equipment blank which should not have been field-filtered for metals.

There were a bunch of aqueous (surface water) samples collected 2/3/11 and they were submitted for both total metals and filtered metals. Those filtered metals were field-filtered.

Thanks,
Mike Z.

From: Brynildsen, Victoria/VBO
Sent: Monday, February 07, 2011 1:55 PM
To: John Heyman [PEL]; Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Hello John,

For Vieques SWMU 6 CTO-111, the Aqueous samples collected on 2/4/11 were field filtered for Metals.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Thursday, February 03, 2011 12:40 PM
To: Zamboni, Michael/WDC
Cc: Brynildsen, Victoria/VBO
Subject: RE: LOA and COC for Vieques SWMU 6

Will do.
Thanks!
John

From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Thursday, February 03, 2011 12:35 PM
To: John Heyman [PEL]
Cc: Victoria.Brynildsen@CH2M.com; Michael.Zamboni@CH2M.com
Subject: RE: LOA and COC for Vieques SWMU 6

Would you please include Vicki on the logins? Files reattached.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Thursday, February 03, 2011 12:33 PM
To: Zamboni, Michael/WDC
Subject: LOA and COC for Vieques SWMU 6

Good afternoon.

3501958

Let me know if anyone else should be on the LOA distribution.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

Corrections to COCs

TO: John Heyman
PEL

COPIES: File
EDD
Data Package

FROM: Victoria Weber
Environmental Information Specialist
CH2M HILL

DATE: February 9, 2011

This memo is to document corrections made to entries on the Chains of Custody (COC) for Vieques SWMU 6, CTO-111.

The following Sample IDs need to be updated.

Correct Sample ID	Incorrect Sample ID	Date	Time
VWW06-EB01-020411	VWAE-EB01-020411	2/4/2011	6:30
VWW06-TB01-020411	VWAE-TB01-020411	2/4/2011	6:45
VWW06-SD001-0211	VWW06-SD01-0211	2/8/2011	11:25
VWW06-SD002-0211	VWW06-SD02-0211	2/8/2011	11:10
VWW06-EB01-020811	VWAE-EB01-020811	2/8/2011	6:00
VWW06-EB02-020811	VWAE-EB02-020811	2/8/2011	6:20
VWW06-TB01-020811	VWAE-TB01-020811	2/8/2011	12:00
VWW06-TB01-020711	VWAE-TB01-020711	2/7/2011	6:00
VWW06-EB01-020711	VWAE-EB01-020711	2/7/2011	6:10
VWW06-EB02-020711	VWAE-EB02-020711	2/7/2011	11:20
VWW06-EB01-020311	VWAE-EB01-020311	2/3/2011	6:30
VWW06-TB04-020311	VWAE-TB04-020311	2/3/2011	11:30

COPYRIGHT 2011 BY CH2M HILL, INC. • COMPANY CONFIDENTIAL

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 16, 2011 6:04 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501977 / Vieques / 7470_D

Good afternoon.

Please note the following that will appear in the case narrative for method 7470_D on SDG 3501977.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350197702A was analyzed with the water samples on 02/10/11. The following analyte(s) were recovered below criteria: Mercury at 63.4 % with criteria of (80-120). Since the LCS/LCSD passed all quality control acceptance criteria, the most probable cause for the PDS exceeding limits is sample matrix. No further action was taken.

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met with the exception of: VWW06-SW004-0211MS was analyzed with the water samples on 02/10/11. The following analyte(s) were recovered below criteria: Mercury at 65.8 % with criteria of (80-120).

   VWW06-SW004-0211SD was analyzed with the water samples on 02/10/11. The following analyte(s) were recovered below criteria: Mercury at 67.2 % with criteria of (80-120). Since the LCS/LCSD passed all quality control acceptance criteria, the most probable cause for the MS/MSD exceeding limits is sample matrix. No further action was taken.
   Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:09 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501977-8151tclpVieques

Good afternoon.

Please note the following that will appear in the case narrative for method 8151TCLP on SDG 3501977.

A. Calibration:

All acceptance criteria were met. 2,4,5-TP was slightly elevated in the CCV, since it was above criteria and no analytes were detected the data was reported and meets criteria.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met with the exception of:
Sample 70501MB was recovered above criteria for the following surrogate(s): DCAA at 109 % with criteria of (54-103).

Sample VWW06-IS01-020211 was recovered above criteria for the following surrogate(s): DCAA at 104 % with criteria of (54-103).

Since the recoveries were only slightly above criteria the data was reported and demonstrates if analytes were present they would have been detected. Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:21 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501977-8081- Vieques
Attachments: 8081 EB data 3501977.pdf

Good afternoon.

Please note the following that will appear in the case narrative for method 8081 on SDG 3501977. I have attached a copy of the Form 1 data for this sample.

A. Samples:

Sample analysis proceeded normally. The Equipment blank had multiple detects of various analytes, The extract was re-run and confirmed the results.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWAE-EB01-020311

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Lab Sample ID: 350197709 Lab File ID: 77-09.D

Sample wt/vol: 940 Units: ML Date Received: 02/04/11

Concentrated Extract Volume: 10 Date Extracted: 02/07/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1048

PercentSolids: 0 decanted : (Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*RL*
319-84-6	alpha-BHC	0.053	U	0.0032	0.053
319-85-7	beta-BHC	0.053	U	0.0013	0.053
319-86-8	delta-BHC	0.053	U	0.0032	0.053
58-89-9	gamma-BHC (Lindane)	0.053	U	0.0026	0.053
76-44-8	Heptachlor	0.053	U	0.0042	0.053
309-00-2	Aldrin	0.053	U	0.0017	0.053
1024-57-3	Heptachlor epoxide	0.053	U	0.0015	0.053
959-98-8	Endosulfan I	0.053	U	0.0046	0.053
60-57-1	Dieldrin	0.053	U	0.0029	0.053
72-55-9	4,4'-DDE	0.053	U	0.004	0.053
72-20-8	Endrin	0.0025	J	0.0019	0.053
33213-65-9	Endosulfan II	0.0034	JP	0.0017	0.053
72-54-8	4,4'-DDD	0.0029	JP	0.0028	0.053
1031-07-8	Endosulfan sulfate	0.0026	J	0.0011	0.053
50-29-3	4,4'-DDT	0.0076	J	0.0012	0.053
72-43-5	Methoxychlor	0.0027	JP	0.0019	0.053
7421-93-4	Endrin aldehyde	0.0022	J	0.0016	0.053
5103-74-2	gamma-Chlordane	0.053	U	0.0026	0.053
5103-71-9	alpha-Chlordane	0.053	U	0.0032	0.053
53494-70-5	Endrin ketone	0.053	U	0.0064	0.053
8001-35-2	Toxaphene	0.53	U	0.19	0.53

Results reported on Primary Column, if RPD >40% results flagged accordingly.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Friday, March 04, 2011 6:23 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501977 / Vieques / 7470

Good afternoon.

Please note the following that will appear in the case narrative for method 7470 on SDG 3501977.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350197702A was analyzed with the water samples on 02/09/11. The following analyte(s) were recovered below criteria: Mercury at 67.1 % with criteria of (80-120). Since the LCS/LCSD pass all quality control criteria, sample matrix suspected for the PDS exceeding limits. No further action was taken.

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
   MS - VWW06-SW004-0211MS was analyzed with the water samples on 02/09/11. The following analyte(s) were recovered below criteria: Mercury at 62 % with criteria of (80-120).

   SD - VWW06-SW004-0211SD was analyzed with the water samples on 02/09/11. The following analyte(s) were recovered below criteria: Mercury at 64.7 % with criteria of (80-120). Since the LCS/LCSD pass all quality control criteria, sample matrix suspected for the MS/MSD exceeding limits. No further action was taken.
   Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of

the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Friday, March 04, 2011 6:23 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501977 / Vieques / 6010

Mike:

Good afternoon.

Please note the following that will appear in the case narrative for method 6010 on SDG 3501977. All samples will be reported at a 20x dilution and then higher dilutions as necessary to have results within calibration range.

1. **Calibration Blanks:**

   All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

   ICB951454 was analyzed on 02/17/11 09:12. The following analyte(s) were detected below RL: Manganese at -0.68 UG/L.
   CCB951461 was analyzed on 02/17/11 11:57. The following analyte(s) were detected below RL: Iron at 8.73 UG/L, Manganese at -0.643 UG/L.
   CCB951473 was analyzed on 02/17/11 12:55. The following analyte(s) were detected below RL: Iron at 11.4 UG/L, Manganese at -0.616 UG/L.
   CCB951485 was analyzed on 02/17/11 13:50. The following analyte(s) were detected below RL: Iron at 11.1 UG/L, Magnesium at 12.2 UG/L, Manganese at -0.613 UG/L.
   CCB951497 was analyzed on 02/17/11 14:51. The following analyte(s) were detected below RL: Aluminum at 13.9 UG/L, Beryllium at 0.141 UG/L, Iron at 14.8 UG/L, Magnesium at 11.7 UG/L, Manganese at -0.577 UG/L.

   CCB951509 was analyzed on 02/17/11 15:57. The following analyte(s) were detected below RL: Iron at 10.3 UG/L, Manganese at -0.619 UG/L, Vanadium at 0.672 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350197702ADL1 was analyzed with the water samples on 02/18/11. The following analyte(s) were recovered above criteria: Sodium at 131.5 % with criteria of (80-120). The most probable cause for Sodium exceeding limits for the PDS is sample matrix due to the parent sample containing a saturated amount of Sodium. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
   MS - VWW06-SW004-0211MS (at 20X dilution) was analyzed with the water samples on 02/17/11. The following analyte(s) were recovered below criteria: Aluminum at 0 % with criteria of (80-120), Barium at 0 % with criteria of (80-120), Beryllium at 0 % with criteria of (80-120), Calcium at 0 % with criteria of (80-120), Iron at 0 % with criteria of (80-120), Magnesium at 0 % with criteria of (80-120), Manganese at 0 % with criteria of (80-120), Nickel at 0 % with criteria of (80-120), Potassium at 0 % with criteria of (80-120), Selenium at 0 % with criteria of (80-120), Thallium at 0 % with criteria of (80-120), Vanadium at 0 % with criteria of (80-120), Zinc at 0 % with criteria of (80-120).

MS - VWW06-SW004-0211MSDL1 (at 100X dilution) was analyzed with the water samples on 02/18/11. The following analyte(s) were recovered below criteria: Sodium at 0 % with criteria of (80-120).

SD - VWW06-SW004-0211SD (at 20X dilution) was analyzed with the water samples on 02/17/11. The following analyte(s) were recovered below criteria: Aluminum at 0 % with criteria of (80-120), Barium at 0 % with criteria of (80-120), Beryllium at 0 % with criteria of (80-120), Calcium at 0 % with criteria of (80-120), Iron at 0 % with criteria of (80-120), Magnesium at 0 % with criteria of (80-120), Manganese at 0 % with criteria of (80-120), Nickel at 0 %
with criteria of (80-120), Potassium at 0 % with criteria of (80-120), Selenium at 0 % with criteria of (80-120), Thallium at 0 % with criteria of (80-120), Vanadium at 0 % with criteria of (80-120), Zinc at 0 % with criteria of (80-120).

SD - VWW06-SW004-0211SDDL1 (at 100X dilution) was analyzed with the water samples on 02/18/11. The following analyte(s) were recovered below criteria: Sodium at 0 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the parent sample being saturated with Sodium and diluted out at a 20X and 100X dilutions. The sample required dilutions to get the Internal Standard to pass and required dilutions for Sodium. No further action was taken.

Samples coded accordingly.

B. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350197702L was analyzed with the water samples on 02/17/11. The following analyte(s) exceeded criteria: Aluminum at 190 % with criteria of (10), Calcium at 11 % with criteria of (10), Magnesium at 59 % with criteria of (10). The most probable cause for the analystes exceeding limits for the SD is sample matrix due to the parent sample containing a saturated amount of Sodium. No further action was taken.

C. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW003-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW003-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW004-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.
Sample VWW06-SW004-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW005-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW005-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW006-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW006-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW007-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW007-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW007R-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW007R-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Friday, March 04, 2011 6:24 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501977 / Vieques / 6010_D

Mike:

Good afternoon.

Please note the following that will appear in the case narrative for method 6010D on SDG 3501977. All samples will be reported at a 20x dilution and then higher dilutions as necessary to have results within calibration range.

1. **Calibration Blanks:**
All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB951454 was analyzed on 02/17/11 09:12. The following analyte(s) were detected below RL: Manganese at -0.68 UG/L.
CCB951497 was analyzed on 02/17/11 14:51. The following analyte(s) were detected below RL: Aluminum at 13.9 UG/L, Beryllium at 0.141 UG/L, Iron at 14.8 UG/L, Magnesium at 11.7 UG/L, Manganese at -0.577 UG/L.
CCB951509 was analyzed on 02/17/11 15:57. The following analyte(s) were detected below RL: Iron at 10.3 UG/L, Manganese at -0.619 UG/L, Vanadium at 0.672 UG/L.
CCB951521 was analyzed on 02/17/11 16:52. The following analyte(s) were detected below RL: Iron at 8.59 UG/L, Manganese at -0.634 UG/L.
CCB951533 was analyzed on 02/17/11 17:53. The following analyte(s) were detected below RL: Iron at 12.9 UG/L, Manganese at -0.606 UG/L.
CCB951534 was analyzed on 02/17/11 17:56. The following analyte(s) were detected below RL: Manganese at -0.682 UG/L.

CCB951546 was analyzed on 02/17/11 18:55. The following analyte(s) were detected below RL: Aluminum at 11.3 UG/L, Iron at 14.8 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Method Blanks:**

All acceptance criteria were met with the exception of:
Blank 70364MB was analyzed with the water samples on 02/18/11. The following analyte(s) were detected below RL: Aluminum at 16.1 UG/L. The hit in the blank is below the RL, therefore, no corrective action was taken.
Samples coded accordingly.

3. **Post Digestion Spike:**

All acceptance criteria were met with the exception of:
Post Digestion Spike 350197702A was analyzed with the water samples on 02/17/11. The following analyte(s) were recovered above criteria: Magnesium at 123.2 % with criteria of (80-120), Selenium at 125.3 % with criteria of (80-120).

Post Digestion Spike 350197702ADL1 was analyzed with the water samples on 02/18/11. The following analyte(s) were recovered above criteria: Sodium at 148.2 % with criteria of (80-120). The most probable cause for the analytes exceeding limits for the PDS is sample matrix due to the sample containing a saturated amount of Sodium. No further action was taken.

4. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW004-0211MS (at 20X dilution) was analyzed with the water samples on 02/17/11. The following analyte(s) were recovered below criteria: Aluminum at 0 % with criteria of (80-120), Barium at 0 % with criteria of (80-120), Beryllium at 0 % with criteria of (80-120), Calcium at 0 % with criteria of (80-120), Iron at 0 % with criteria of (80-120), Magnesium at 0 % with criteria of (80-120), Manganese at 0 % with criteria of (80-120), Nickel at 0 % with criteria of (80-120), Potassium at 0 % with criteria of (80-120), Selenium at 0 % with criteria of (80-120), Sodium at 0 % with criteria of (80-120), Thallium at 0 % with criteria of (80-120), Vanadium at 0 % with
criteria of (80-120), Zinc at 0 % with criteria of (80-120).
MS - VWW06-SW004-0211MSDL1 (at 100X dilution) was analyzed with the water samples on 02/18/11. The following analyte(s) were recovered below criteria: Sodium at 0 % with criteria of (80-120).

SD - VWW06-SW004-0211SD (at 20X dilution) was analyzed with the water samples on 02/17/11. The following analyte(s) were recovered below criteria: Aluminum at 0 % with criteria of (75-125), Barium at 0 % with criteria of (75-125), Beryllium at 0 % with criteria of (75-125), Calcium at 0 % with criteria of (75-125), Iron at 0 % with criteria of (75-125), Magnesium at 0 % with criteria of (75-125), Manganese at 0 % with criteria of (75-125), Nickel at 0 % with criteria of (75-125), Potassium at 0 % with criteria of (75-125), Selenium at 0 % with criteria of (75-125), Sodium at 0 % with criteria of (75-125), Thallium at 0 % with criteria of (75-125), Vanadium at 0 % with criteria of (75-125), Zinc at 0 % with criteria of (75-125).

SD - VWW06-SW004-0211SDDL1(At 100X dilution) was analyzed with the water samples on 02/18/11. The following analyte(s) were recovered below criteria: Sodium at 0 % with criteria of (75-125). The following analyte(s) exceeded RPD criteria: Sodium at 28.1 % with criteria of (20). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the parent sample being saturated with Sodium and diluted out at 20X and 100X dilutions. The sample required dilutions to get the Internal Standard to pass and required dilutions for Sodium. No further action was taken.
Samples coded accordingly.

B. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW003-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW003-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW004-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed
limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW004-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW005-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW005-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW006-0211 required a 20X dilution. The sample required a 20X dilution due to being

saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW006-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW007-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW007-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW007R-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes other than Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW007R-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

PEL, a Division of Spectrum Analytical, Inc.
8405 Benjamin Rd., Suite A
Tampa, FL 33634
(P) 813-888-9507 (F) 813-889-7128

CHAIN-OF-CUSTODY RECORD

Friday, February 04, 2011 12:36:44 PM

WorkOrder: 3501977

Send to:
Mitkem
175 Metro Center Blvd.
Warwick, RI 02886
Phone: 401-732-3400 FAX:

Project: Vieques
Project Name Vieques/SWMU 6/402244.FI.SW.06 CTO 11

Report To: John Heyman, Ext 2
Report Level: 4
Report RLU or MDLU: RL U
J Code results between MDL and RL

K0201

	Sample ID	LabID	Collection Date	Date Needed	Mtx	Cont	Requested Tests: 1010	6020.D	6020	7,3,3.2OL	7,3,42 OL						Comments
1	VWW06-SW003-0211	350197701	2/3/2011 10:45:00 AM	2/17/2011	W	1		X	X								foreign samples
2	VWW06-SW004-0211	350197702	2/3/2011 8:15:00 AM	2/17/2011	W	1		X	X								
2	VWW06-SW004-0211MS	350197703	2/3/2011 8:15:00 AM	2/17/2011	W	1		X	X								
2	VWW06-SW004-0211SD	350197704	2/3/2011 8:15:00 AM	2/17/2011	W	1		X	X								
3	VWW06-SW005-0211	350197705	2/3/2011 6:40:00 AM	2/17/2011	W	1		X	X								
4	VWW06-SW006-0211	350197706	2/3/2011 9:30:00 AM	2/17/2011	W	1		X	X								
5	VWW06-SW007-0211	350197707	2/3/2011 10:10:00 AM	2/17/2011	W	1		X	X								
6	VWW06-SW007R-0211	350197708	2/3/2011 10:10:00 AM	2/17/2011	W	1		X	X								
7	VWAE-EB01-020311	350197709	2/3/2011 6:30:00 AM	2/17/2011	W	1		X	X								
8	VWW06-IS01-020211	350197711	2/2/2011 10:00:00 AM	2/17/2011	S	1	X			X	X						

3501977

Comments: ASO

		Date/Time		Date/Time
Relinquished by:	MA	2-8-11 1720	**Received by:**	2/9/11 8:45
Relinquished by:			**Received by:**	~~2/4/2011 12:36:44 PM~~ SW 2/9/11
Relinquished by:			**Received by:**	

4,5°C

MITKEM LABORATORIES
Sample Condition Form

Received By:	Reviewed By:	Date: 2/9/11	Mitkem Work Order #: K0201
Client Project: Viequs		Client: PEL	

1) Cooler Sealed — (Yes) / No

2) Custody Seal(s) — (Present) / Absent; (Coolers) / Bottles; (Intact) / Broken

3) Custody Seal Number(s) — NA

4) Chain-of-Custody — (Present) / Absent

5) Cooler Temperature — 4.5

IR Temp Gun ID — MT-1

Coolant Condition — ice

6) Airbill(s) — (Present) / Absent

Airbill Number(s) — FedEx
464007700727
464007700738

7) Samples Bottles — (Intact) / Broken / Leaking

8) Date Received — 2/9/11

9) Time Received — 8:45

Preservative Name/Lot No.:

Lab Sample ID		Preservation (pH) HNO_3	H_2SO_4	HCl	NaOH	H_3PO_4	VOA Matrix	Soil Headspace or Air Bubble ≥ 1/4"
K0201	01	<2						
	02							
	03							
	04							
	05							
	06							
	07	<2						
K0201	08							

VOA Matrix Key:

US = Unpreserved Soil	A = Air
UA = Unpreserved Aqueous	H = HCl
M = MeOH	E = Encore
N = NaHSO4	F = Freeze

See Sample Condition Notification/Corrective Action Form yes / no

Form ID: QAF.0006 Rad OK yes / no

\\Bernoulli\qa_safety\Controlled Forms\QAF.0006 sample condition form

Shirley Ng [Mitkem]

From: John Heyman [PEL]
Sent: Friday, February 11, 2011 5:11 PM
To: Shirley Ng [Mitkem]; Edward Lawler [Mitkem]
Subject: Vieques sample ID changes

Shirley:
Good afternoon.
Client has a couple of sample ID changes for Vieques samples that we had already sent up to you.

3501993 – PEL ID -14 should be VWW06-EB01-020411
3501977 – PEL ID -09 should be VWW06-EB02-020311 – K0201-07

Prefix was VWAE on the OL COCs and PEDD that we had sent to you.

Let me know if you have any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

YES NO N/A

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3501977 LAB: PEL

SITE NAME: SWMU 6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? Y ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? Y ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? Y ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. VOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? Y ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? Y ___ ___

1.3 Sample Conditions/Problems

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ ✓ ___

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R".

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ".

Sampled 2/3/11 Analy 2/14-16/11
Recd 2/4/11 Temp 1.6-5.8°C

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? ___ ✓ ___

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	> 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	> 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	> 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water [✓] ___ ___

b. Soil [ ] ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water [✓] ___ ___

b. Soil [ ] ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, section 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. lab [✓] ___ ___

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? [ ] ___ [✓]

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2. [ ] [✓] ___

If yes, were samples reanalyzed? [ ] ___ [✓]

Were method blanks reanalyzed? [ ] ___ [✓]

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] ✓ ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Sample(Form III/Equivalent)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. [✓] ___ ___

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

A. Water [✓] ___ ___

B. Soil [ ] ___ ___

C. Med Soil [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ [✓]

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits. [ ] [✓] ___

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	**Non-Detected Spiked Compounds**
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

5.0 Matrix Spikes(Form III or equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? ✓ ___ ___

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? ✓ ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

a. Water [✓] ___ ___

b. Waste [ ] ___ ___

c. Soil/Solid [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7)for each matrix. [✓] ___ ___

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [✓] ___ ___

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

4-methyl-2pentanone 1% above QC criteria in MS however w/in criteria for MSD ∴ no qual

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD results in conjunction with other QC criteria to determine the need for some qualification.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as well as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determine that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

YES NO N/A

6.0 Blank (CLP Form IV Equivalent)

6.1 Is the Method Blank Summary form present? ✓ ___ ___

6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ✓ ___ ___

6.3 Has a method blank been analyzed for each GC/MS system used ? ✓ ___ ___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject ® all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds? ✓ ___ ___

7.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are <u>not</u> used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. ✓ ___ ___

YES NO N/A

7.2 Do any field/rinse blanks have positive volatile organic compound results? ✓ | | ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

VWW06-TB01-020311 No ⊕

VWW06-EB01-020311 See attached sheet

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

Additional Region II Worksheet listing blank qualifications due to method and/or QC Blank Contamination

SDG# 3501977

VOA

The associated method and/or QC blanks exhibited contamination as noted in the following table.

Blank ID	Compound	Concentration	Reporting Limit (LOD)
021411BLK32	acetone	3.7 ug/L	2.6 ug/L
	1,2,4-trichlorobenzene	0.13J	0.22
021511BLKA34	acetone	33.3J	2.6
	1,2,4-trichlorobenzene	0.14J	0.22
	1,2,3-trichlorobenzene	0.22J	0.32
VWW06-EB01-020311	methylene chloride	0.82J	1.3

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code
VWW06-SW004-0211, VWW06-SW006-0211	acetone	U at value	MBL

YES NO N/A

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. ✓ ___ ___

NOTE: For the analysis of volatiles, the method requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? ✓ ___ ___

9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? ✓ ___ ___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? ✓ ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ ✓ ___

9.7 Have the appropriate number of significant figures (two) been reported? ✓ ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. ✓ ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

YES NO N/A

10.0 Target Analytes (CLP Form I Equivalent)

10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate ☑ ___ ___

b. Matrix spikes and matrix spike duplicates ☑ ___ ___

c. Blanks ☑ ___ ___

d. Laboratory Control Samples ☑ ___ ___

10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate ☑ ___ ___

b. Matrix spikes and matrix spike duplicates (Mass spectra not required) ☑ ___ ___

c. Blanks ☑ ___ ___

d. Laboratory Control Samples ☑ ___ ___

ACTION: If any data are missing, take action specified in 3.2 above.

10.3 Is chromatographic performance acceptable with respect to:

Baseline stability? [ ] ___ ___

	YES	NO	N/A
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		

Other:_____

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? [✓] ___ ___

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab for missing spectra.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? [✓] ___ ___

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [✓] ___ ___

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? [✓] ___ ___

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

No TICs

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ___

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ___

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ___

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ___ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? ✓ ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC accedence dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? ✓ ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? ✓ ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39)qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? ✓ ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. ✓ ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] [✓] ___ ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 GC/MS Calibration Verification (CLP Form VII Equivalent)

YES NO N/A

15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest? [✓] ___ ___

15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2). [ ] [✓] ___

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? [ ] ✓ ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? [✓] ___ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit

(Attach additional sheets if necessary.)

ACTION:
1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

2. Do not qualify non-detects when the associated IS are counts area > + 100%.

3. If the IS area is below the lower limit (< - 50%), qualify all associated non-detects (U-values) "J".

4. If extremely low area counts are reported (< - 25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? ☑ ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? ✓ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

VWW06-SW007-0211
VWW06-SW007P-0211 > No ⊕

Please note sample VWW06-SW007P-0211 was listed as sample VWW06-SW007R-0211. Form 1s were corrected by validator.

Initial Calibration Date: 2/8/2011

RRF and %RSD Calculations:

Compound Name: vinyl chloride
Lab Value: 0.386

Area of Compound	788859
Area of Internal STD	1277822
Conc. of Internal STD	50
Conc. of Compound	80
Calculated RRF	0.386

Compound Name: ethylbenzene
Lab Value: 10.50

RRF of STD 1	0.470
RRF of STD 2	0.606
RRF of STD 3	0.533
RRF of STD 4	0.477
RRF of STD 5	0.429
RRF of STD 6	0.548
RRF of STD 7	0.539
RRF of STD 8	0.544
RRF of STD 9	0.570
Calculated % RSD	10.51

Continuing Calibration File ID: 2/14/2011

RRF and %D Calculations:

Compound Name: 4-methy-2-pentanone
Lab Value: 0.087

Area of Compound	195956
Area of Internal STD	1128191
Conc. of Internal STD	50
Conc. of Compound	100
Calculated RRF	0.087

Compound Name: ethylbenzene
Lab Value: 0.7

Average RRF	0.524
Calibration Check RRF	0.528
Calculated % D	-0.7

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA 8260B/SW846

IV. PREPARATION

Water samples were prepared by SW846/5030 for EPA8260B volatiles analysis. All aspects of sample preparation proceeded without exception.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met. Please note that:

Blank 021411BLKA32 was analyzed with the water samples on 02/14/11. The following analyte(s) were detected below RL: 1,2,4-Trichlorobenzene at 0.13 UG/L, Acetone at 3.7 UG/L.

Blank 021511BLKA34 was analyzed with the water samples on 02/15/11. The following analyte(s) were detected below RL: 1,2,3-Trichlorobenzene at 0.22 UG/L, 1,2,4-Trichlorobenzene at 0.14 UG/L, Acetone at 3.3 UG/L.

No further action was necessary, since the detected hits re below the RL. Samples coded accordingly.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

An LCS/LCSD set was analyzed. All percent recovery and relative percent difference (RPD) criteria were met.

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)**

A client requested MS/SD set was analyzed. All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

MS - VWW06-SW004-0211MS was analyzed with the water samples on 02/14/11. The following analyte(s) were recovered above criteria: 4-Methyl-2-pentanone at 136 % with criteria of (60-135).

No further action was required. Samples coded accordingly.

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Lisa Pelo Title: VOA Manager

SIGNED: **DATE:** 03/02/2011

VOLATILE ORGANIC CROSS REFERENCE TABLE

Lab Name: PEL Laboratories, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Method: 8260

EPA Sample No	Lab Sample ID
VWW06-SW003-0211	350197701
VWW06-SW004-0211	350197702
VWW06-SW005-0211	350197705
VWW06-SW006-0211	350197706
VWW06-SW007-0211	350197707
VWW06-SW007R-0211	350197708
VWW06-EB01-020311	350197709
VWW06-TB01-020311	350197710

090311 1731

YES NO N/A

E - The concentration of this analyte exceeds the calibration range of the instrument.

A - Indicates a Tentatively Identified Compound (TIC) is a suspected adol-condensation product.

X,Y,Z- Laboratory defined flags. The data reviewer must change these qualifiers during validation so that the data user may understand their impact on the data.

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3501977 LAB: PEL

SITE NAME: SWMU 6 CTO-11

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format? ✓ ___ ___

ACTION: If not, note the effect on review of the data in the data assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? ✓ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ✓ ___ ___

YES NO N/A

II. SEMIVOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? [✓] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ [✓] ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, all non-detects data are qualified as unusable (R), and detects are flagged "J".

ACTION: If samples were not iced, or if the ice was melted upon arrival at the laboratory and the cooler temperature was elevated (10°C), flag all positive results "J" and all non-detects "UJ".

Temp 1.6-5.8°C

Sampled 2/3/11 Extr 2/7+11/11
Recd 2/4/11 Analy 2/9+18/11

2.0 Holding Times

2.1 Have any semivolatile technical holding times, determined from date of collection to date of extraction, been exceeded? [✓] [ ] ___

Continuous extraction of water samples for semivolatile analysis must be started within **7** days of the date of collection. Soil/sediment samples must be extracted within **14** days of collection. Extracts must be analyzed within

Samples were RE due to cont. in MBLK - RE was out of HT's. These sample were not used

YES NO N/A

40 days of the date of extraction.

Table of Holding Time Violations

(See Traffic Report)

Sample ID	Sample Matrix	Date Sampled	Date Lab Received	Date Extracted	Date Analyzed
All samples RE one day out of holding time due to MBLK cont. — these samples were not used.					

ACTION: If technical holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

	YES	NO	N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Have the semi volatile surrogate recoveries been listed on CLP Surrogate Recovery forms (Form II) for each of the following matrices:

a. Low Water	☑	___	___
b. Low/Med Soil	☐	___	___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery Summary forms for each matrix:

a. Low Water	☑	___	___
b. Low/Med Soil	☐	___	___

ACTION: If CLP deliverables are unavailable, document the effect(s) in data assessments. In some cases the lab may have to be contacted to obtain the data necessary to complete the validation.

3.3 Were outliers marked correctly with an asterisk?	☐	___	☑

ACTION: Circle all outliers in red.

3.4 Were two or more base neutral OR acid surrogate recoveries out of specification for any sample or method blank (Reviewer should use lab in house recovery limits. Use surrogate recovery limits from USEPA National Functional Guidlines January 2005 page 130, if in house limits are not available. See Method 8000B-43 or 80000C-24).	☐	☑	___

Note: Examine lab in house limits for reasonableness.

If yes, were samples re-analyzed?	☐	___	☑

	YES	NO	N/A
Were method blanks re-analyzed?	[ ]	___	✓

ACTION: If all surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet method specifications, <u>for the affected fraction only (i.e. either base-neutral or acid compounds):</u>

1. Flag all positive results as estimated ("J").

2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.

3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any base-neutral <u>or</u> acid surrogate has a recovery of < 10%:

1. Positive results for the fraction with < 10% surrogate recovery are qualified with "J".

2. Non-detects for that fraction should be qualified as unusable (R) .

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

3.5 Are there any transcription/calculation errors between raw data and Form II?	___	✓ [ ]	___

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and document

YES NO N/A

effect in data assessments.

4.0 Matrix Spikes (Form III/Equivalent)

4.1 Have the semivolatile Matrix Spike and Matrix Spike Duplicate/or duplicate unspiked Sample recoveries been listed on the Recovery Form (Form III)? ☑ ___ ___

NOTE: Method 3500B/page 4 states the spiking compounds:

Base/neutrals	Acids
1,2,4-Trichlorobenzene	Pentachlorophenol
Acenaphthene	Phenol
2,4-Dinitrotoluene	2-Chlorophenol
Pyrene	4-Chloro-3-methylphenol
N-Nitroso-di-n-propylamine	4-Nitrophenol
1,4-Dichlorobenzene	

Note: Some projects may require the spiking of specific compounds of interest.

Note: See Method 8270D-sec 8.4.2 for deciding on whether to prepare and analyze duplicate samples or a martix spike/matrix spike duplicate. If samples are expected to contain target analytes, then laboratory may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, laboratory should use a matrix spike and matrix spike duplicate pair.

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water ☑ ___ ___

b. Low Solid ☐ ___ ___

c. Med Solid ☐ ___ ___

YES NO N/A

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above. It may be necessary to contact the lab to obtain the required data.

NOTE: If the data has not been reported on CLP equivalent form, then the laboratory must provide the information necessary to evaluate the spike recoveries in the MS and MSD. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

4.3 Were matrix spikes performed at concentration equal to 100ug/L for acid compounds, and 200ug/l for base compounds (Method 3500B-4), or those specified in project plan. ✓ ___ ___

4.4 How many semivolatile spike recoveries are outside Laboratory in house MS/MSD recovery limits (use recovery limits values in Method 8270D-43&44 Table 6 if in house values not available).

Water

0 out of 18

Solids

___ out of ___

YES NO N/A

4.5 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Solids
0 out of 18	___ out of ___

ACTION: Circle all outliers with red pencil.

ACTION: No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the matrix spike and matrix spike duplicate results in conjunction with other QC criteria to determine the need for some qualification of the data.

4.6 Was a Laboratory Control Sample (LCS) analyzed with each analytical batch? [ ] ___ ___

NOTE: When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

5.0 Blanks (Form IV/Equivalent)

5.1 Is the Method Blank Summary (Form IV) present? [✓] ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported per 20 samples of similar matrix, or concentration level, and for each extraction batch? [✓] ___ ___

5.3 Has a method blank been analyzed either after

	YES	NO	N/A
the calibration standard or at any other time during the analytical shift for each GC/MS system used ?	✓		

ACTION: If any method blank data are missing, call lab for explanation/resubmittal. If not available, use professional judgement to determine if the associated sample data should be qualified.

5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra.

	YES	NO	N/A
Is the chromatographic performance (baseline stability) for each instrument acceptable for the semivolatiles?	✓		

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

	YES	NO	N/A
6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.	✓		
6.2 Do any field/rinse/ blanks have positive results for target analytes and/or TICs (if required, see section 10 below)?	✓		

YES NO N/A

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks. If gross contamination exists, all data in the associated samples should be qualified as unusable (R).

Method blank exhibited cont and one result above the RL samples were RE however they were done out of HT therefore these samples were not used.

Additional Region II Worksheet listing blank qualifications due to method and/or QC Blank Contamination

SDG# 3501977

SVOA

The associated method and/or QC blanks exhibited contamination as noted in the following table.

Blank ID	Compound	Concentration	Reporting Limit (LOD)
70262MB	2-methylnaphthalene	0.025J	0.04
	fluorene	0.036J	0.04
	naphthalene	0.028J	0.04
	phenanthrene	0.057	0.04
	pyrene	0.022J	0.04
VWW06-EB01-020311	2-methylnaphthalene	0.026J	0.04
	fluorene	0.035J	0.04
	naphthalene	0.032J	0.04
	phenanthrene	0.052	0.04

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code
VWW06-SW003-0211, VWW06-SW005-0211, VWW06-SW06-0211, VWW06-SW007-0211, VWW06-SW007P-0211	2-methylnaphthalene	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW007P-0211	fluorene	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW005-0211, VWW06-SW0060-0211, VWW06-SW007-0211, VWW06-SW007P-0211	naphthalene	U at LOD	MBL
VWW06-SW003-0211, VWW06-SW007P-0211	phenanthrene	U at value	MBL
VWW06-SW003-0211, VWW06-SW005-0211	pyrene	U at LOD	MBL

YES NO N/A

Blank Action for Semivolatile Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification required
	< CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	= CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report concentration of sample with a U
		≥ CRQL and ≥ blank contamination	No qualification required

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: If the laboratory did not report TIC analyses, check the project plans to verify whether or not it was required.

6.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

6.4 Was a instrument blank analyzed after each sample/dilution which contained a target compound

	YES	NO	N/A
that exceeded the initial calibration range.	[ ]	✓	
6.5 Does the instrument blank have positive results for target analytes and/or TICs?		[ ]	✓

Note: Use professional judgement to determine if carryover occurred and qualify analytes accordingly.

7.0 GC/MS Apparatus and Materials

	YES	NO	N/A
7.1 Did the lab use the proper gas chromatographic column for analysis of semivolatiles by Method 8270D? Check raw data, instrument logs or contact the lab to determine what type of column was used. The method requires the use of 30 m x 0.25 mm ID (or 0.32 mm ID), silicone-coated, fused silica, capillary column.	✓		

ACTION: If the specified column, or equivalent, was not used, document the effects in the data assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (Form V/Equivalent)

	YES	NO	N/A
8.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for decafluorotriphenylphosphine (DFTPP)?	✓		

NOTE: The performance solution should also contain 4,4-DDT, pentachlorophenol, and benzidine to verify injection port inertness and column performance. The degradation of DDT to DDE and DDD must be less than 20% total and the response of pentachlorophenol and benzidine should be within normal ranges for these compounds (based upon lab experience) and show no peak degradation or tailing before samples are analyzed. (see section 5.5

YES NO N/A

page 8270D-12).

8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? ✓ ___ ___

8.3 Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument? ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable (R).

8.4 Have the ion abundances been normalized to m/z 198? ✓ ___ ___

8.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

	YES	NO	N/A
ACTION: If ion abundance criteria are not met, take action specified in section 3.2			
8.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.)		✓	
8.7 Have the appropriate number of significant figures (two) been reported?	✓		
ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document effect in data assessments.			
8.8 Are the spectra of the mass calibration compound acceptable?	✓		
ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			

9.0 Target Analytes

9.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates	✓		
c. Blanks	✓		
9.2 Has any special cleanup, such as GPC, been performed on all soil/sediment sample extracts (see section 7.2, page 8270D-14)?			✓

	YES	NO	N/A

ACTION: If data suggests that extract cleanup was not performed, use professional judgement. Make note in the data assessment narrative.

9.3 Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	✓		
c. Blanks	✓		

ACTION: If any data are missing, take action specified in 3.2 above.

9.4 Are the response factors shown in the Quant Report?	✓		
9.5 Is chromatographic performance acceptable with respect to:			
Baseline stability?	✓		
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		
Other:_____			

ACTION: Use professional judgement to determine the acceptability of the data.

9.6 Are the lab-generated standard mass spectra of identified semivolatile compounds present for

208

	YES	NO	N/A
each sample?	✓		

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the data assessment narrative. If spectra are missing, reject all positive data.

9.7 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	✓		
9.8 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?	✓		
9.9 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum?	✓		

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R), flagged "N" (Presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 9.7, 9.8, and 9.9.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

	YES	NO	N/A

10.0 Tentatively Identified Compounds (TIC)

10.1 If Tentatively Identified Compounds were required for this project, are all Form Is, Part B present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier? NO TICs

NOTE: Review sampling reports to determine if the lab was required to identify non target analytes (refer to section 7.6.2,page 8270D-21).

10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following: [ ] ___ ___ ✓

a. Samples and/or fractions as appropriate [ ] ___ ___ ✓

b. Blanks [ ] ___ ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by CAS #.

10.3 Are any target compounds from one fraction listed as TIC compounds in another (e.g., an acid compound listed as a base neutral TIC)? ___ [ ] ___ ✓

ACTION: i. Flag with "R" any target compound listed as a TIC.

ii. Make sure all rejected compounds are properly reported in the other fraction.

10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the

	YES	NO	N/A
sample mass spectrum?	[ ]	___	✓
10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%?	[ ]	___	✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate and remove "JN". Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R."

11.0 Compound Quantitation and Reported Detection Limits

11.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	[✓]	___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

11.2 Are the method detection limits adjusted to reflect sample dilutions and, for soils, sample moisture?	[✓]	___	___

YES NO N/A

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original Form I (if present) and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red " X" across the entire page of all Form I's that should not be used, including any in the summary package.

12.0 Standards Data (GC/MS)

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant, Reports) present for initial and continuing calibration? ☑ ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

13.0 GC/MS Initial Calibration (Form VI/Equivalent)

13.1 Is the Initial Calibration Form (Form VI/ Equivalent) present and complete for the semivolatile fraction? ☑ ___ ___

ACTION: If any calibration forms or standard row data are missing, take action specified in 3.2 above.

13.2 Are all base neutral or acid RRFs > 0.050? ☑ ___ ___

YES NO N/A

Check the **average RRFs** of the four System Performance Check Compounds (SPCCs): N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and 4-nitrophenol. These compounds must have **average RRFs** greater than or equal to 0.05 before running samples and should not show any peak tailing.

ACTION: Circle all outliers in red.

ACTION: For any target analyte with **average RRF <0.05**

1. "R" all non-detects;

2. "J" all positive results.

13.3 Are response factors for base neutral or acid target analytes stable over the concentration range of the calibration (% Relative standard deviation [%RSD] < 20.0%)? ✓ ___ ___

NOTE: The % RSD for each individual Calibration Check Compound (CCC, Method 8270D-40 see Table 4) must be less than 30% before analysis can begin. If grater 30%, the lab must clean and recalibrate the instrument.

CALIBRATION CHECK COMPOUNDS

Base/Neutral Fraction	Acid Fraction
Acenaphthene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2,4-Dichlorophenol
Hexachlorobutadiene	2-Nitrophenol
Diphenylamine	Phenol
Di-n-octyl phthalate	Pentachlorophenol
Fluoranthene	2,4,6-Trichlorophenol

YES NO N/A

Benzo(a)pyrene

ACTION: If the %RSD for any CCC >30% and no corrective action taken, then "J" qualify all positive hits and "UJ" qualify all non-detects.

ACTION: Circle all outliers in red.

ACTION: If the % RSD is ≥ 20.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, flag all non- detect results for that analyte "R," unusable. Alternatively, the lab should calculate first or second order regression fit of the calibration curve and select the fit which introduces the least amount of error.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

13.4 Did the laboratory calculate the calibration curve by the least squares regression fit? ___ [✓] ___

13.5 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or % RSD? (Check at least two values but if errors are found, check more.) ___ [✓] ___

ACTION: Circle Errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in data assessments.

13.5 Do the target compounds for this SDG include Pesticides? [ ] ___ ✓ ___

214

YES NO N/A

13.6 If the pesticide compounds include DDT, was the percent breakdown of DDT to DDD and DDE greater than 20%? ___ [ ] ✓

ACTION: If DDT percent breakdown exceeds 20%:

i. Qualify all positive results for DDT with "J". If DDT was not detected, but DDD and DDE results are positive, qualify the quantitation limit for DDT as unusable, "R".

ii. Qualify all positive results for DDD and DDE as presumptively present at an approximate concentration "JN".

14.0 GC/MS Calibration Verification (Form VII/Equivalent)

14.1 Are the Calibration Verification Forms (Form VII) present and complete for all compounds of interest? ✓ ___ ___

14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? ✓ ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

_____

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed within twelve hours of every sample analysis,

	YES	NO	N/A
call lab for explanation/resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").			
14.3 Do any of the SPCCs have an RRF <0.05?	___	[ ]	___
If YES, make a note in data assessment if the lab did not take corrective action specified in section 7.4.4, page 8270D-18.	[ ]	___	___
14.4 Do any of the CCCs have a %D between the initial and continuing RRF which exceeds 20.0%?			
ACTION: If yes, make a note in data assessment.			
14.5 Do any semivolatile compounds have a % Difference (% D) between the initial and continuing RRF which exceeds 20.0%?	___	[ ]	___
ACTION: Circle all outliers in red.			
ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated (J). When %D is above 90%, qualify all non-detects for that analyte as "R", unusable.			
14.6 Do any semivolatile compounds have a RRF < 0.05?	___	[ ]	___
ACTION: Circle all outliers in red.			
ACTION: If RRF < 0.05, qualify as unusable ("R") associated non-detects and "J" associated positive values.			
14.7 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or percent difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more).	___	[ ]	___

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

YES NO N/A

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect(s) in the data assessments.

15.0 Internal Standards (Form VIII)

15.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to + 100%) for each continuing calibration? ✓ ___ ___

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area	LowerLimit	Upper Limit

(Attach additional sheets if necessary.)

Note: Check Table 5, 8270D-41 for associated analytes.

ACTION: i. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard.

ii. Non-detects associated with IS > 100% should not be qualified.

YES NO N/A

iii. If the IS area is below the lower limit (<50%), qualify all associated non-detects (U-values) "J". If extremely low area counts are reported (<25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable (R).

15.2 Are the retention times of all internal standards within 30 seconds of the associated calibration standard? ✓ ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Laboratory Control Samples (LCS)

16.1 Were any LCS samples run in order to verify analytes which failed criteria for spike recovery? ✓ ___ ___

16.2 Did the lab spike LCS sample spiked with the same analytes and the same concentrations as the matrix spike? ✓ ___ ___

16.3 Were the mean and standard deviation of all analytes within the QC acceptance ranges as shown in Table 6, 8270D-43? ✓ ___ ___

ACTION: If the recovery of any analyte falls out of the designated range, the analytical results for that compound is suspect and should be qualified "J" in the unspiked samples.

17.0 Field Duplicates

17.1 Were any field duplicates submitted for semivolatile analysis? ✓ ___ ___

VWW06-SW007-0211, All attached sheet

DataQual **PAH**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SW007-0211
Duplicate Sample ID: VWW06-SW007P-0211

Water: RPD>75%
Soil: RPD>75%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
phenol			#DIV/0!
naphthalene			#DIV/0!
2-methylnaphthalene			#DIV/0!
1-methylnaphthalene			#DIV/0!
acenaphthylene			#DIV/0!
acenaphthene			#DIV/0!
fluorene	0.055		200
phenanthrene	0.079		200
anthracene			#DIV/0!
fluoranthene			#DIV/0!
pyrene			#DIV/0!
benzo(a)anthracene			#DIV/0!
chrysene			#DIV/0!
benzo(b)fluoranthene			#DIV/0!
benzo(k)fluoranthene			#DIV/0!
benzo(a)pyrene			#DIV/0!
indeno(1,2,3-cd)pyrene			#DIV/0!
dibenz(a,h)anthracene			#DIV/0!
benzo(g,h,i)perylene			#DIV/0!

* one or ** both values below CRQL

COMMENTS: Qualify fluorene and phenanthrene as estiamted (J/UJ).

Initial Calibration Date: 2/8/2011

RRF and %RSD Calculations:

Compound Name: napthalene

Lab Value: 1.062

Area of Compound	231950
Area of Internal STD	17466
Conc. of Internal STD	0.8
Conc. of Compound	10
Calculated RRF	1.062

Compound Name: benzo(g,h,i)perylene

Lab Value: 7.6

RRF of STD 1	1.823
RRF of STD 2	1.521
RRF of STD 3	1.403
RRF of STD 4	1.468
RRF of STD 5	1.425
RRF of STD 6	1.592
RRF of STD 7	1.565
RRF of STD 8	1.573
RRF of STD 9	1.561
RRF of STD 10	1.599
Calculated % RSD	7.6

Continuing Calibration File ID: 2/9/2011

RRF and %D Calculations:

Compound Name: chrysene

Lab Value: 1.227

Area of Compound	20336
Area of Internal STD	26519
Conc. of Internal STD	0.8
Conc. of Compound	0.5
Calculated RRF	1.227

Compound Name: phenanthrene

Lab Value: 3.7

Average RRF	1.109
Calibration Check RRF	1.15
Calculated % D	-3.7

SAMPLE CALCULATION

Sample ID: VWW06-SW006-0211
Standard ID: 2/8/2011
Compound: 2-methylnaphthalene
Concnetration: 0.032 ug/L

	Water (ug/L)	Soil (ug/Kg)
Area of Compound	524	
Area of Internal STD	21069	
Conc. of Internal (ng)	0.8	2
RRF of Compound	0.65032	
Final Volume	1000	1000
Dilution Factor	1	10
GPC Factor	NA	1
Injection Volume	1	1
Weight of Sample	NA	30.01
Initial Volume of Sample	960	NA
% Moisture	NA	0.369
Concentration	0.032	#DIV/0!

	RT of Internal STD	RT of Compound	RRT
Sample	7.235	7.938	1.097
Standard	7.249	7.939	1.095

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: The following samples were re-prepped out of hold: VWW06-EB01-020311RE1, VWW06-SW003-0211RE1, VWW06-SW004-0211MSRE1, VWW06-SW004-0211RE1, VWW06-SW004-0211SDRE1, VWW06-SW005-0211RE1, VWW06-SW006-0211RE1, VWW06-SW007-0211RE1, VWW06-SW007R-0211RE1. The original extraction for these samples was within hold. Due to target compounds detected in the method blank greater than the RL, the samples were re-extracted out of hold with both sets of data reported.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8270D.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8270 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met with the exception of:
Blank 70262MB was analyzed with the water samples extracted on 02/07/11. The following analyte(s) were detected below RL: 2-Methylnaphthalene at 0.025 UG/L, Fluorene at 0.036 UG/L, Naphthalene at 0.028 UG/L, Pyrene at 0.022 UG/L. The following analyte(s) were detected above RL: Phenanthrene at 0.057 UG/L. Since Phenanthrene was detected above the RL, all associated samples were re-extracted out of hold with both sets of data reported.

Blank 71154MB was analyzed with the water samples extracted on 02/11/11. The following analyte(s) were detected below RL: Phenanthrene at 0.022 UG/L.
Samples coded accordingly. Since this compound was only detected below the RL, no further action was taken.

C. Surrogates:

All acceptance criteria were met.

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met with the exception of:
LCS 70263LCS was analyzed with the water samples extracted on 02/07/11. The following analyte(s) were recovered above criteria: 2-Methylnaphthalene at 108 % with criteria of (45-105), Naphthalene at 102 % with criteria of (40-100). The following analyte(s) had marginal exceedance limit failures: Benzo(a)anthracene at 122 % with criteria of (45.8-119.2).

Samples coded accordingly. Since just a few compounds were recovered only slightly low, no further action was taken.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW004-0211MSRE1 was analyzed with the water samples extracted on 02/11/11. The following analyte(s) were recovered below criteria: Acenaphthylene at 37.3 % with criteria of (50-105).

SD - VWW06-SW004-0211SD was analyzed with the water samples extracted on 02/07/11.. The following analyte(s) exceeded RPD criteria: Acenaphthylene at 21.8 % with criteria of (20).

SD - VWW06-SW004-0211SDRE1 was analyzed with the water samples extracted on 02/11/11.. The following analyte(s) exceeded RPD criteria: Acenaphthylene at 69 % with criteria of (20).

Samples coded accordingly. The most probable cause is matrix interference. No further action was taken.

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Signature: **Name:** Brian C. Spanfi **Title:** Lab Director

SIGNED: **DATE:**
03/03/2011

USEPA Region II
SW846 Method 8081B Pesticides

Date: October 2006
SOP HW-44, Rev.1.0

PACKAGE COMPLETENESS AND DELIVERABLES

TCLP not validated

CASE NUMBER: _____ SDG# 3501977
LAB: PEL SITE: Viegues Summit

1.0 Data Completeness and Deliverables	YES	NO	N/A
1.1 Has all the data been submitted in CLP deliverable format?	☑		
1.2 Have any missing deliverables been received and added to the data package?			✓

Resubs/corrections required

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative			
2.1 Is a laboratory narrative or cover letter present?	☑		
2.2 Are the case number and/or SDG number contained in the narrative or cover letter?	☑		

3.0 Data Validation Checklist			
3.1 Does this data package contain:			
Water data?	☑		
Waste data?			✓
Soil/solid data?			✓

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Tuesday, April 19, 2011 6:07 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs
Attachments: P1598.pdf; P1469.pdf; P4026.pdf; P3933.pdf; P3316.pdf; P2995.pdf; P1385.pdf; P1193.pdf; P2427.pdf; P2727.pdf; P2850.pdf; P1275.pdf; P1518.pdf; P1612.pdf

Jackie:
Good afternoon.
I have attached revised 8081/8082 prep logs. The Clean up used (if any) can be found in the 2nd to the last column on the Extraction Logs.
Please contact me with any questions or concerns.
These pages have been paginated with the SDG number at the bottom of each page for reference.
Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Friday, April 15, 2011 9:52 AM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Hi John,

Please tell me where I would find this information in the prep. logs. I see a list of solvents, etc. at the end of the extraction page but don't know if that indicates that something was done. For example – on the pesticides for SDG 3501993 p 2996 florisil is mentioned with a number. However, the statement below suggests that there was no florisil clean-up performed. I need to be able to see what you have done as Region II questions are very specific on their DV check-lists. If clean-ups are performed, exactly where would they be listed in the logs? Thanks for further clarification!

Jackie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Friday, April 15, 2011 8:14 AM
To: John Heyman [PEL]; Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Jackie:
Per our Lab Manager:

If we perform clean ups then:

Only copper clean ups performed on the 8081. If we perform any clean ups then all the samples and QC would go through the same clean up steps.
PCBs get copper and acid treated, again all QC receive the same treatment.

227

This should have been noted in the prep logs if performed.

Let me know if you need any additional information.

Thanks!
John

From: Mark Gudnason [PEL] **On Behalf Of** John Heyman [PEL]
Sent: Thursday, April 14, 2011 4:49 PM
To: Jacqueline Cleveland; John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: Question RE- Pesticides & PCBs

Jackie,

John has left for the day but will address this asap tomorrow.

Mark

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, April 14, 2011 4:07 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: FW: Question RE- Pesticides & PCBs
Importance: High

Hi John,

I am just verifying that you received the question noted below! Thank you.

Jackie

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Wednesday, April 13, 2011 8:04 PM
To: 'John Heyman [PEL]'
Cc: 'DataQual Environmental Services, LLC'; 'Michael.Zamboni@CH2M.com'; 'Vickie.Weber@ch2m.com'
Subject: Question RE- Pesticides & PCBs

Good Morning John,

Quick question on the extraction procedures for the Pesticides and PCBs. I need to know what clean-up procedures were used on the sample extracts and whether or not any QC checks were performed to verify the procedures. If there were clean-up checks (for example – florisil cartridge checks) please include results of those checks in your response. Thanks for your help!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

ORGANOCHLORINE PESTICIDE

	YES	NO	N/A

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? | [Y] | | |

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? | | [N] | |

ACTION: If any sample analyzed as a soil, other than than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, all non detects are qualified as unusable, "R", and positive results flagged "J".

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any organochlorine pesticide technical holding times, determined from date of collection to date of extraction, been exceeded? | | [N] | |

Water and waste samples for organochlorine pesticide analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8081.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8081 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

E. Internal Standards:

This method does not require the use of internal standards.

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

F. Samples:

Sample analysis proceeded normally.

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:
Name: Brian C. Spaan **Title:** Lab Director

SIGNED: **DATE:**
03/03/2011

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

MANUAL INTEGRATION SUMMARY

The following analytes were manually integrated by the chemist.

Sample: 70269LCSD Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: 70269LCSD Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: 70269LCSD Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: 70269LCSD Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: 70269LCSD Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: VWAE-EB01-020311 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: VWAE-EB01-020311 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: VWAE-EB01-020311 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: VWAE-EB01-020311 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Sample: VWAE-EB01-020311 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV950769 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV950769 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV950769 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV950769 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV950769 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952082 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952082 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952082 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952082 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: CCV952082 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952083 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952083 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952083 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952083 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952083 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952472 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952472 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952472 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952472 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952472 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952473 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952473 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952473 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952473 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952473 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: CCV953006 Analyte: alpha-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: beta-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: delta-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: gamma-BHC (Lindane) Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Heptachlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953006 Analyte: Methoxychlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: CCV953007 Analyte: alpha-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: beta-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: delta-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: gamma-BHC (Lindane) Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Heptachlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953007 Analyte: Methoxychlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: CCV953008 Analyte: alpha-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: beta-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: delta-BHC Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: gamma-BHC (Lindane) Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Heptachlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953008 Analyte: Methoxychlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953023 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953023 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953023 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953023 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953023 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: EVA950476 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA950756 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952051 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952051 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952051 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952052 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952078 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952078 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952078 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952078 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952078 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952078 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952081 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952081 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952081 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952081 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952081 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952081 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA953014 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA953014 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD950457 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD950459 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD950460 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD950462 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD950464 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Methoxychlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak

These manual integrations have been reviewed and meet all criteria in accordance with PEL's SOP regarding manual integration.

Priscilla Conklin
Priscilla Conklin
Chemist

CHEMIST: **DATE:** 02/23/2011

W:\Narratives\SemiVols\3501\3501977_8081MI.doc

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Signature: _____

Name: Brian C. Spanfelner **Title:** Lab Director

SECTION LEADER:
DATE: 02/23/2011

ACTION: Qualify sample results according to Table 1.

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J*	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

YES NO N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [✓] ___ ___

b. Soil/Solid [ ] ___ [✓]

3.2 Are all the pesticide samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ [✓]

c. Soil/Solid [ ] ___ [✓]

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ lab QC limits for all samples, including MS and MSDs, LCSs and all blanks? [✓] ___ ___

Note: Reviewer shall use lab in-house recover limits if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate action Table 2.

3.5 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate action, Table 2 below.

YES NO N/A

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample(LCS)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples. [✓] ___ ___

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

YES NO N/A

4.2 Were Laboratory Control Samples analyzed at the required concentration for all analytes of interest as specified ~~in Table 3 below.~~ lab SOP/client SAP ☑ ___ ___

Note: Use lab in-house criteria, if available.

Table 3. LCS Spiking Criteria

LCS Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml	Recovery Limits (%)
gamma-BHC	0.05	1	50-120
Heptachor epoxide	0.05	1	50-120
Dieldrin	0.01	1	30-130
4,4'-DDE	0.01	1	50-150
Endrin	0.01	1	50-120
Endosulfan sulfate	0.01	1	50-120
gamma-Chloradane	0.05	1	30-130
Tetrachloro-m-xylene(surrogate)	0.20	3	30-150
Decachlorobiphenyl (surrogate)	0.40	3	30-150

Note: The LCS might be spiked with the same analytes at the same concentration as the matrix spike.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed ~~in table above?~~ [✓] ___ ___

lab SOP/client SAP

YES NO N/A

ACTION: For LCS % recovery not meeting the required recovery, follow the required action in Table 4 below.

Table 4. LCS Recovery Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Upper Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent) SW004

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [✓] ___ ___

NOTE: For soil and waste samples showing detectable amounts of organics, the lab may substitute replicate samples in place of the matrix spike (see page 8000B-40, section 8.5.3).

5.2 Have MS/MD or MS/MSD results been summarized on Form III/Equivalent? [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000B-39, section 8.5.])

	YES	NO	N/A
a. Water	[✓]	___	___
b. Waste	[ ]	___	✓
c. Soil/Solid	[ ]	___	✓

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 We Were Matrix Spike Samples analyzed at the required concentration for all analytes of interest as specified ~~in Table 5 below.~~ lab SOP / client SAP [✓] ___ ___

Note: Spiking analytes may differ from those in Table 5. Check QA project plan or task order.

Table 5. Matrix Spiking Criteria

Matrix Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml
gamma-BHC	0.05	1
Heptachor	0.05	1
Aldrin	0.05	1
Dieldrin	1.0	1
Endrin	1.0	1
4,4'-DDT	1.0	1

Note: For aqueous organic extractable, the spike concentration should be:

1) For regulatory compliance monitoring - the regulatory concentration limit or 1 to 5 times the expected background concentration, whichever is higher;

2) For all other aqueous samples - the larger of either 1 to 5 x times the expected background

YES NO N/A

concentration, or the same as the QC check sample concentration (see section 4 above);

3) For soil/solid and waste samples - the recommended concentration is 20 times the estimated quantitation limit (EQL).

No action is taken based on MS or replicate data alone. However, using informed professional judgement, the data reviewer may use the matrix spike or laboratory replicate results in conjunction with other QC criteria and determine the need for some qualification of the data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples.

5.5 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in ~~Table 6 below.~~ lab SOP/client SAP ☑ ___ ___

Note: Use lab in-house criteria, if available.

Table 6. Matrix Spike Recovery Criteria

Compound	% Recovery Water	RPD Water	% Recovery Soil	RPD Soil
gamma-BHC	56-123	0-15	46-127	0-50
Heptachor	40-13	0-20	35-130	0-31
Aldrin	40-120	0-22	34-132	0-43
Dieldrin	52-126	0-18	31-134	0-38
Endrin	56-121	0-21	42-139	0-45
4,4'-DDT	38-127	0-27	23-134	0-50

NOTE: The actual number of MS analytes depends on the number analytes being measured (e.g., total number of MS plus MSD compounds). If only chlordane or toxaphene are the analytes of

YES NO N/A

interest, the spiked sample should contain the most representative multi-component analyte.

ACTION: Follow the matrix spike actions (Table 7) for pesticide analyses.

Table 7. Matrix Spike Qualifying Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% R ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limit	No qualifications	

Note: When the results of the matrix spike analyses indicates a potential problem due to the sample matrix itself, the LCS results are used to verify the laboratory can perform analyses in a clean matrix.

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on Method Blank Summary form(s) (Form IV)?

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ☑ ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any other time during the analytical shift.

YES NO N/A

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for pesticides? [✓] ___ ___

ACTION: Use professional judgement to determine the effect on the data.

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for organochlorine pesticides? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ [✓] ___

7.2 Do any field/rinse blanks have positive organochlorine pesticide results? [✓] [ ] ___

No impact - no + results in assoc. samples.

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in

YES NO N/A

another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 8 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 8. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying the calibration criteria.

Note: When applied as described in Table 8 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams", "junk peaks"), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference.

YES NO N/A

Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? [✓] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic column used for the analysis of organochlorine pesticides? Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (See Method 8081B-8, section 4.2) [✓] ___ ___

8.2 If capillary columns were used, were they both wide bore (.53 mm ID) fused silica GC columns, such as DB-608 and DB-1701 or equivalent. Indicate the specific type of column used for:

column 1: STX CLP I

column 2: STX CLP II

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. DDT/endrin breakdown check [✓] ___ ___

	YES	NO	N/A
b. toxaphene	✓		
c. technical chlordane	✓		✓
d. 5 pt. initial calibration standards	✓		
e. calibration verification standards	✓		
f. LCS	✓		
g. Method blanks	✓		

ACTION: If no, take action specified in 3.2 above.

9.2 Has a DDT/endrin breakdown check standard (at the mid-concentration level) been analyzed at the beginning of each analytical sequence on both columns (page 8081B-24, section 8.2.3)? ✓

ACTION: If no, take action as specified in 3.2 above.

9.3 Has the individual % breakdown exceeded 20.0% on either column for:

- 4,4' - DDT? ✓
- endrin? ✓

ACTION: If any % breakdown has failed the QC criteria in the breakdown check standard, qualify all sample analyses in the entire analytical sequence as described below.

a. If 4,4'-DDT breakdown is greater than 20.%:

i. Qualify all positive results for DDT with 'J". If DDT was not detected, but DDD and DDE are positive, then qualify the quantitation limit for DDT as unusable ("R").

ii. Qualify positive results for DDD and DDE as presumptively present at an approximated quantity ("NJ").

YES NO N/A

b. If endrin breakdown is greater than 20.0%:

i. Qualify all positive results for endrin with "J". If endrin was not detected, but endrin aldehyde and endrin ketone are positive, then qualify the quantitation limit for endrin as unusable ("R").

ii. Qualify positive results for endrin ketone and endrin aldehyde as presumptively present at an approximated quantity ("NJ").

9.4 Are data summary forms (containing calibration factors or response factors) for the initial 5 pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? ☑ ___ ___

NOTE: If internal standard calibration procedure is used (page 8000B-16, section 7.4.2.2), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (page 8000B-16, section 7.4.2.1), then calibration factors must be used.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.5 Are there any transcription/calculation errors between raw data and data summary forms. ___ ☑ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.6 Are standard retention time (RT) windows for each analyte of interest presented on modified CLP summary forms? ☑ ___ ___

YES NO N/A

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all pesticides are established using retention times from three calibration standards analyzed during the entire analytical sequence (page 8081B-15, section 7.4.6).

A 72 hr. sequence is not required with this method, however, the method states that best results are obtained using retention times which span the entire sequence; i.e., using the mid level from the 5 pt. calibration, one of the mid-concentration standards analyzed during mid-sequence and one analyzed at the end.

9.7 Were RT windows on the confirmation column established using three standards as described above? Per lab SOP [Y] ___ ___

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.6 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.8 Do all standard retention times in each level of the initial 5 pt. calibrations for pesticides fall within the windows established during the initial calibration sequence? [Y] ___ ___

ACTION: i. If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standards, spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows

YES NO N/A

may be too tight. If so, RT windows should be recalculated as per page 8081B-15, section 7.4.6.2

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

ACTION: For toxaphene and chlordane, the RT may be outside the RT window, but these analytes may still be identified from their individual patterns.

9.9 Has the linearity criteria for the initial calibration standards been satisfied for both columns? (% RSD must be < allowable limits* for all analytes). ✓ ___ ___

ACTION: If no, follow the actions in Table 9 below.

Table 9. Initial Calibration Linearity Criteria

Criteria	Criteria	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD exceeds allowable limits*	J	No qualification
% RSD within allowable limits*	NO qualifications	

* %RSD ≤ 20% for single component compounds except alpha-BHC and delta-BHC.
%RSD ≤ 25% for alpha-BHC and delta-BHC
%RSD ≤ 30% for Toxaphene peaks
%RSD ≤ 30% for surrogates(tetrachloro-m-xylene and decachlorobiphenyl).

9.10 Has a calibration verification standard containing all analytes of interest been analyzed on each

Initial Calibration Date: 2/15/11, Instrument SECD03 - Column 1
RRF and %RSD Calculations:

Compound Name: alpha-BHC in level 3
Lab Value: 19045.7000

Area of Compound	190457
Conc. of Compound	10
Calculated CF	19045.700

Compound Name: alpha-BHC
Lab Value: 8.3

CF of STD 1	17263.000
CF of STD 2	18994.200
CF of STD 3	19045.700
CF of STD 4	20705.325
CF of STD 5	20526.900
CF of STD 6	22417.375
CF of STD 7	21183.580
CF of STD 8	21560.400
Calculated % RSD	8.26

Continuing Calibration File ID: 2/18/2011 @ 1801, file ID PCCV2A.D
RRF and %D Calculations:

Compound Name: 4,4'-DDT
Lab Value: 11494.4750

Area of Compound	459779
Conc. of Compound	40
Calculated CF	11494.475

Compound Name: 4,4'-DDT
Lab Value: 14.7

Average CF	13475.465
CF of CCV	11494.475
Calculated % D	14.7

YES NO N/A

working day, prior to sample analyses (pages 8081B-15, sections 7.5.2)? [✓] ___ ___

9.11 Has a calibration verification standard also been analyzed after every ~~10~~ 20 (per method) samples and at the end of each analytical sequence (page 8081B-15, section 7.5.2)? [✓] ___ ___

ACTION: If no, take action as specified in section 3.2 above.

9.12 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence (closing CCV). Has no more than 72 hours elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene CCV? [✓] ___ ___

ACTION: See Table 10 below.

9.13 Has the percent difference (%D) exceeded ± 20% for any organochlorine pesticide analyte in any calibration verification standard? ___ [✓] ___

9.14 Has a new 5 pt. calibration curve been generated for those analytes which failed in the calibration verification standard (page 8081B-16, section 7.5.2.2), and all samples which followed the out-of-control standard (page 8081B-16, section 7.5.2.3) reinjected? [ ] ___ [✓]

ACTION: If the %D for any analyte exceeded the ± 20% criterion and the instrument was not recalibrated for those analytes, see table below.

9.15 Have <u>daily</u> retention time windows been properly calculated for each analyte of interest (page 8081B-16, section 7.5.3)), using RTs from the associated mid concentration standard and standard deviation from the initial calibration)? [✓] ___ ___

per lab SOP

YES NO N/A

ACTION: If no, take action specified in section 3.2 above or recalculate RT windows using the procedure outlined in method 8081B-16, section 7.5.3.

9.16 Do all standard retention times for each mid concentration standard fall within the windows established during the initial calibration sequence? ✓ ___ ✓

9.17 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows (page 8081B-16, section 7.5.3)? ✓ ___ ___

ACTION: If the answer to either 9.15 or 9.16 above is no, check the chromatograms of all samples which followed the last in-control standard. All samples analyzed after the last in-control standard must be re-injected, if initial analysis indicated the presence of the specific analyte that exceeded the retention time criteria (page 8081B-18, section 7.5.7.). If samples were not re-analyzed, document under Contract Non-compliance in the Data Assessment.

Reviewer has two options to determine how to qualify questionable sample data. First option is to determine if possible peaks are present within daily retention time window. If no possible peaks are found, non-detects are valid. If possible peaks are found (or interference), qualify positive hits as presumptively present "NJ" and non-detects are rejected "R". Second option is to use the ratio of the retention time of the analyte over the retention time of either surrogate. The passing criteria is ± 0.06 RRT units of the RRT of the standard component. Reject "R" all questionable analytes exceeding criteria, and "NJ" all other positive hits.

For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use option 2 specified in paragraph above.

YES NO N/A

See Table 10 below.

Table 10. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RT out of RT window	Use professional judgement	
%D not within +/- 20%	J	UJ
Time elapsed greater than section 9.12 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.18 Are there any transcription/calculation errors between raw data and data summary forms? ___ [✓] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it

YES NO N/A

accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

11.0 Extraction Method Cleanup Efficiency Verification (Form IX/Equivalent)

11.1 Method 8081B permits a variety of extraction techniques to be used for sample preparation. Which extraction procedure was used?

1. Aqueous samples:

1. Separatory funnel (Method 3510) ✓

2. Continuous liquid-liquid extraction (Method 3520) _____

3. Solid phase extraction (Method 3535) _____

4. Other _____

2. Solid samples:

1. Soxhlet (Method 3540) _____

2. Automated Soxhlet (Method 3541) _____

3. Pressurized fluid (Method 3545) _____

4. Microwave extraction (Method 3546) _____

5. Ultrasonic extraction (Method 3550) _____

6. Supercritical fluid (Method 3562) _____

7. Other _____

11.2 Is Form IX - Pest-1/Equivalent present and complete for each lot of Florisil/Cartridges used? (Florisil Cleanup, Method 3620A, is required for all organochlorine pesticide extracts.) [ ] ___ ✓

Florisil not required per lab SOP

YES NO N/A

ACTION: If no, take action specified in 3.2 above. If data suggests that florisil cleanup was not performed, make note in the reviewer narrative.

NOTE: Method 3620A uses Florisil, while the SOW/CLP allows for Florisil cartridges. Method 3620A does not list which pesticides and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct pesticide list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.3 Are all samples listed on modified CLP Pesticide Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.4 If GPC Cleanup was performed, is Form IX - Pest-2/ Equivalent present? [ ] ___ ✓

ACTION: If GPC was not performed and sample results indicate significant sulfur interference, make note in the data assessment.

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.5 Were the same compounds on Form IX used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.6 Are percent recoveries (% R) of the pesticide and surrogate compounds used to check the efficiency of the cleanup procedures within QC limits listed on Form IX:

80-120% for florisil cartridge check? [ ] ___ ✓

80-110% for GPC calibration? [ ] ___ ✓

YES NO N/A

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 80%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for pesticide compounds. Qualify positive results "J" (estimated).

NOTE: If 2,4,5-trichlorophenol was used to measure the efficiency of the Florisil cleanup and the recovery was > 5%, sample data should be evaluated for potential interferences.

12.0 Pesticide Identification

12.1 Has CLP Form X, showing retention time data for positive results on the two GC columns, been completed for every sample in which a pesticide was detected? ☑ ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and Florisil cleanup verification forms)? ___ ☑ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both analyses? ☑ ___ ___

Note: Confirmation can be supported by other qualitative techniques such as GC/MS (Method 8270), or GC/AED (Method 8085) if sensitivity permits.

YES NO N/A

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently (see section 9.7 above). Also check for false negatives among the multiple peak compounds toxaphene and chlordane. Were there any false negatives? ___ [4] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation used as the second column Confirmation? (This is not required). [ ] ___ ___

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%~~? 40% (per method) [4] ___ ___

NOTE: The method 8081B requires quantitation from one column. The second column is to confirm the presence of an analyte. Calibration for the Confirmation column is a one point calibration. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

10

PESTICIDE ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.

VWW06-EB01-020311

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Lab Sample ID: 350197709 Date(s) Analyzed: 02/18/11 02/18/11

Instrumet ID (1): SECD03 Instrumet ID (2): SECD03

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D	
Endrin	*	1	6.685	6.696	0.011	3202	0.23	0.0025		
		2	6.769	6.781	0.012	6064	0.28	0.003	18.18	
Endosulfan II	*	1	7.008	7.015	0.007	4339	0.32	0.0034		
		2	7.071	7.081	0.010	12120	0.55	0.0059	53.76	J
4,4'-DDD	*	1	6.724	6.730	0.006	3463	0.27	0.0029		
		2	6.880	6.887	0.007	9070	0.44	0.0047	47.37	J
Endosulfan sulfate	*	1	8.358	8.370	0.012	2950	0.24	0.0026		
		2	8.033	8.044	0.011	6094	0.32	0.0034	26.67	
4,4'-DDT	*	1	7.143	7.141	0.002	9682	0.72	0.0076		
		2	7.353	7.363	0.010	13676	0.70	0.0075	1.32	
Methoxychlor	*	1	7.870	7.874	0.004	1525	0.25	0.0027		
		2	8.493	8.503	0.010	3914	0.40	0.0042	43.48	J
Endrin aldehyde	*	1	7.647	7.645	0.002	2346	0.20	0.0022		
		2	7.584	7.591	0.007	5578	0.30	0.0032	37.04	
2,4,5,6-tetrachloro-m-xylene	*	1	2.835	2.839	0.004	829443	74	0.78		
		2	2.788	2.792	0.004	1471063	73	0.77	1.29	
Decachlorobiphenyl	*	1	10.826	10.837	0.011	1132058	86	0.92		
		2	11.398	11.408	0.010	1741991	92	0.98	6.32	

* Column used for quantitation

YES NO N/A

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier
0-~~25%~~ 40 per method	none
40 ~~26~~-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected) "NJ"	
>50% (Pesticide vale is <CRQL)	"U"
>201%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that the higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ N ___

NOTE: Single-peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

SAMPLE CALCULATION

Sample ID: VWW6-EB01-020311
Standard ID: ICAL 2/15/11
Compound: methoxychlor
Concentration: 0.0027J ug/L

	Water (ug/L)	Soil (ug/Kg)
Area of Compound	1525	
CF of Compound	5990.562917	
Final Volume	10	
Dilution Factor	1	
Split Factor	1	
Injection Volume	1	
Weight of Sample	na	
Initial Volume of Sample	940	NA
Conversion Factor	1	
Percent Solids Factor	1	
Concentration	0.00271	#DIV/0!

YES NO N/A

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? ✓ ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? ✓ ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ ✓ ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for organochlorine pesticide analysis? ✓ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

SW007/SW007P
ND +

270

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made to determine the proper identification of field duplicates.

Yes NO N/A

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 3501977

LAB: PEL SITE: Vieques PR

1.0 Data Completeness and Deliverables

1.1 Has all the data been submitted in CLP deliverable format? [✓] ___ ___

1.2 Have any missing deliverables been received and added to the data package? [ ] ___ ✓

Resubs / corrections required.

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? [✓] ___ ___

2.2 Are the case number and/or SDG number contained in the narrative or cover letter? [✓] ___ ___

3.0 Data Validation Checklist

3.1 Does this data package contain:

Water data? ✓ ___

Waste data? ___ ✓

Soil/solid data? ___ ✓

POLYCHLORINATED BIPHENYLS

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? [✓] ___ ___

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8082 for Aroclor analysis.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8082 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

PCB 1016 and PCB 1260 were used as the spiking solution for all QC spikes.

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

E. Internal Standards:

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

This method does not require the use of internal standards.

F. Samples:

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:

Name: Brian C. Spaan Title: Lab Director

SIGNED: **DATE:** 03/01/2011

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

MANUAL INTEGRATION SUMMARY

The following analytes were manually integrated by the chemist.

Calibration Sample: CCV949273 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949273 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949274 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949274 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949274 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949274 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949274 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949274 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949275 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949276 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: CCV949276 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949277 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV949278 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949188 Analyte: 1232-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949188 Analyte: 1232-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949188 Analyte: 1232-5 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD949193 Analyte: 1221-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1221-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1221-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949197 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD949199 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD949201 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-4 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD949243 Analyte: 1254-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD949263 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Calibration Sample: STD949267 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change

These manual integrations have been reviewed and meet all criteria in accordance with PEL's SOP regarding manual integration.

Signature:
Name: Brian C. Spann Title: Lab Director

CHEMIST: **DATE:**
02/14/2011

Signature:
Name: Brian C. Spann Title: Lab Director

SECTION LEADER:
DATE: 02/23/2011

W:\Narratives\SemiVols\3501\3501977_8082LMI.doc

Yes NO N/A

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ___ [✓] ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, non detects shall be qualified as unusable, "R."

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any PCB technical holding times, determined from date of collection to date of extraction, been exceeded? ___ [✓] ___

Water and waste samples for PCB analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction. Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

ACTION: If technical holding times are exceeded, flag all positive results as estimated, "J," and sample quantitation limits "UJ" and document in the narrative that holding times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all the data should at least be

Yes NO N/A

qualified "J", but the reviewer may determine that non-detects are unusable, "R." (Table 1)

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [✓] ___ ___

Yes NO N/A

b. Soil/Solid [ ] ___ ✓

3.2 Are all the PCB samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ ✓

c. Soil/Solid [ ] ___ ✓

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ for all samples, including MS and MSDs, LCSs and all blanks? lab SOP/client SAP [✓] ___ ___

Note: Reviewer shall use lab in-house recovery limits, if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate criteria, Table 2.

Note: DCB is used when PCBs are determined as Aroclors. DCB is the internal standard when determining PCB congeners and TCMX the surrogate.

3.4 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate criteria, Table 2.

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement

		Yes NO N/A
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample (LCS)

4.1 Are raw data and percent recoveries present for all Laboratory Control samples as required by Method 8000B (section 8.5) and Method 8082A (section 8.4.2)? [✓] ___ ___

Verify that QC check samples were extracted and analyzed by the same procedures used for the actual samples.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation/ resubmittals. Make note in the data assessment.

NOTE: For aqueous samples, an additional QC check sample must be prepared and analyzed when any analyte in a matrix spike fails the required acceptance criteria (see section 5.3 below).

Yes NO N/A

The additional QC check sample must contain each analyte that failed in the MS analysis.

Note: When the results for matrix spike analysis indicates a problem due to sample matrix effects, the LCS results are used to verify the laboratory can perform the analysis in a clean sample.

4.2 Were Laboratory Control Samples analyzed at the required concentration as specified in Method 8000B(sec 8.5) for all analytes as specified ~~in Table 3.~~ in lab SOP/client SAP [✓] ___ ___

Note: Use lab in-house criteria, if available.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Were the LCS recoveries within the percent recoveries as specified in ~~Table 3.~~ lab SOP/client SAP [✓] ___ ___

Table 3. LCS Criteria

Compound	% Recovery
Aroclor 1016	50-150
Aroclor 1260	50-150
Tetrachloro-m-xylene (surrogate)	30-150
decachlorobiphenyl (surrogate)	30-150

4.4 If no, were Laboratory Control Samples re-analyzed? [ ] ___ [✓]

ACTION: If QC check samples were not re-analyzed, or a general system problem is indicated by repeated failure to meet the QC acceptance criteria specified in the method, make note in the data assessment and use Table 4 recovery actions criteria.

Yes NO N/A

Table 4. LCS Recovery Actions

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Lower Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent) SW004

5.1 Are all data for one matrix spike and matrix duplicate (unspiked) pair (MS/Dup) or matrix spike/matric spike duplicate (MS/MSD)present and complete for each matrix (Method 8082A Section 8.4.1)? [✓] ___ ___

NOTE: For soil and waste samples showing detectable amounts of target analytes, the lab may substitute replicate samples in place of the matrix spike (see Method 8000B-40, section 8.5.3).

5.2 Have MS/Dup or MS/MSD results been summarized on modified CLP Form III? [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/Dup, MS/MSD must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month (Method 8000B-39 (section 8.5)).

a. Water [✓] ___ ___

	Yes	NO	N/A
b. Waste	[ ]	___	___ ✓
c. Soil/Solid	[ ]	___	✓

ACTION: If any MS/Dup or MS/MSD data are missing, take the action specified in 3.2 above.

5.4 Were ~~Laboratory Control Samples~~ MS/MSD Samples analyzed for all analytes as specified in Table 5, or did the lab use ~~the optional~~ QC acceptance criteria i.e., in-house criteria? [✓] ___ ___

List the criteria used and make note in data assessment.

Criteria used 25-145 1016
~~30~~-145 1260

Table 5. MS/MSD Criteria

Compound	Percent Recovery QC Limits	RPD
Aroclor 1016	29-135	0-15
Aroclor 1260	29-135	0-20

5.5 Was the matrix spike prepared at the proper spike concentration? (Method 8000B, section 8.5.1-8.5.2) per lab SOP [✓] ___ ___

For aqueous organic extractable, the spike concentration should be prepared according options in: Method 8000B-40, (section 8.5.1 and 8.5.2).

5.6 Were the matrix spike and matrix spike duplicate recovery and RPD limits met as specified in Table 5. Note: No qualification of the data is necessary on MS and MSD data alone. Use professional judgement to use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If any MS and MSD, percent recovery, or RPD results in the Arcolor fraction is out of specification (Table 5), qualify data to include the consideration of the existence interference in the raw data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples. Use professional judgement to determine the need for qualifications of detects of non-spiked compounds.

Yes NO N/A

[✓] ___ ___

per lab SOP

Table 6. MS/MSD Actions for Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on CLP equivalent Method Blank Summary form(s) (Form IV)? [✓] ___ ___

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? [✓] ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any time during the analytical shift.

ACTION: If any blank data are missing, take action as specified above (section 3.2) . If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system

Yes NO N/A

printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for PCBs? ✓

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ✓

7.2 Do any field/rinse blanks have positive PCB results? ✓

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 7 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 7. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples

Yes NO N/A

Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying for calibration criteria.

Note: When applied as described in Table 7 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

Yes NO N/A

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic capillary column used for the analysis of PCBs? [✓] ___ ___

Action: Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (Method 8082, section 4.2)

8.2 Indicate the specific type of narrow bore or wide bore (.53 mm ID, fused silica GC columns, such as DB-608 and DB-1701 or equivalent).

column 1: STX-CLP 1

column 2: STX-CLP 2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. Samples [✓] ___ ___

b. All blanks [✓] ___ ___

c. Matrix spike samples [✓] ___ ___

d. 5 pt. initial calibration standards [✓] ___ ___

e. calibration verification standards [✓] ___ ___

f. Laboratory Control samples (LCS) [✓] ___ ___

ACTION: If no, take action specified in 3.2 above.

9.2 Are data summary forms (containing calibration factors or response factors) for the initial 5

Yes NO N/A

pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? ✓ ___ ___

Note: Calibration Aroclor mixtures other than 1016/1260 may be used (as per approved project QA plan)

NOTE: If internal standard calibration procedure is used (Method 8000B-15(section 7.4.2.2)), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (Method 8000B-16 (section 7.4.2.1)), then calibration factors must be used. The internal standard approach is highly recommended for PCB congener analysis.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.3 Are there any transcription/calculation errors between raw data and data summary forms? ___ ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.4 Are standard retention time (RT) windows for each PCB peak of interest presented on modified CLP summary forms? ✓ ___ ___

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all PCBs are established using retention times from three calibration standards analyzed during the entire analytical sequence (Method 8000B, section 7.6). Best results are obtained

Yes NO N/A

using retention times which span the entire sequence; i.e., using the calibration verification/continuing calibration standards analyzed every 12 hours.

9.5 Were RT windows on the confirmation column established using three standards as described above? [ ] ___ ___

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.4 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.6 Do all standard retention times in each level of the initial 5 pt. calibrations for PCBs fall within the windows established during the initial calibration sequence? [✓] ___ ___

ACTION i: If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standard spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows may be too tight. If so, RT windows should be recalculated as per Method 8081B-15 (section 7.4.6).

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

9.7 Has the linearity criteria for the initial calibration standards been satisfied for both

Yes NO N/A

columns? (% RSD for the calibration factors (CFs) for the three to five major peaks of each of the Aroclor compounds must be < 20.0%). [✓] ___ ___

ACTION: If no, follow Table 8 criteria.

Table 8. Initial Calibration CF Action for Aroclor Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD > 20%	J	UJ
% RSD within allowable limits	No qualifications	

9.8 Does the calibration verification/continuing calibration standard contain the PCB peaks of interest, analyzed on each working day, prior to sample analyses (Method 8082, sections 7.6.2)? [✓] ___ ___

9.9 Has a calibration verification/continuing calibration standard been analyzed after every ~~10~~ samples and at the end of each analytical sequence 20 per method (Method 8082A, section 7.6.2). [✓] ___ ___

ACTION: If no, take action as specified in section 3.2 above.

9.10 Has the percent difference (%D) between the Calibration Factor (CF) of each of the three to five peaks used to identify the Aroclor in the CCV and the CF from these peaks in the initial calibration exceeded ± ~~15%~~. 20% per method ___ [✓] ___ used avg as rec.

9.11 Has a new 5 pt. initial calibration curve been generated for those PCB analytes which failed in the calibration verification/continuing calibration standard (8000B, section 7.7.3), and all samples which followed the out-of-control

Yes NO N/A

calibration verification/standard continuing calibration Standard? [ ] __ ✓

ACTION: If the %D for any analyte exceeded the ± 15% criterion and the instrument was not recalibrated for those analytes, qualify positive results for all associated samples (those which followed the out-of-control standard) "J" and sample quantitation limits "UJ". (see Table 9)

9.12 Have retention time (RT) windows been properly calculated for each analyte of interest (Method 8000B, section 7.6), using RTs from the associated calibration verification/continuing standard? per lab SOP [4] __ __

ACTION: If no, take action specified in section 3.2 above

9.13 Do all standard retention times for each calibration verification/continuing calibration standard fall within the windows established during the initial calibration sequence? [4] __ ✓

9.14 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows. [4] __ __

ACTION: For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use paragraph B below. If the answer to either 9.13 or 9.14 above is no, check the chromatograms of all samples which followed the last in-control standard. If samples were not re-analyzed, all samples analyzed after the last in-control standard must be evaluated using professional judgement.

(A) For non-detected target compounds, check to see if the sample chromatograms contain any peaks that are close to the expected RT window of the Arcolor of interest. If no peaks are present, no qualification of data is necessary. If peaks are present close th RT window of the Aroclor of interest, qualify the non-detected values as presumptively present "N".

Initial Calibration Date: 2/10/11, on STX-CLP1
RRF and %RSD Calculations:
Compound Name: AR1260 peak 2 in level 2
Lab Value: 8834600.0000

Area of Compound	176692
Conc. of Compound	0.02
Calculated CF	8834600.000

Compound Name: AR1260 Peak 2
Lab Value: 10.2

CF of STD 1	9755833.333
CF of STD 2	8834600.000
CF of STD 3	8231710.000
CF of STD 4	7482520.000
CF of STD 5	7794005.000
CF of STD 6	7773178.000
CF of STD 7	
CF of STD 8	
Calculated % RSD	10.22

Continuing Calibration File ID: 2/11/10, 1710
RRF and %D Calculations:
Compound Name: AR1260, peak 4
Lab Value: 22580560.0000

Area of Compound	2258056
Conc. of Compound	0.1
Calculated CF	22580560.000

Compound Name: AR1260, peak 4
Lab Value: 7.8

Average CF	20944279.000
CF of CCV	22580560
Calculated % D	-7.8

Yes NO N/A

(B) For detected compounds in the affected samples, if peaks within the RT window, no qualification necessary. If peaks are close to the expected RT window of the Aroclor of interest, the reviewer can examine the data package for the presence of three or more standards the Aroclor of interest that were run within the analytical sequence during which the sample was analyzed. If three or more such standards are present, the RT window can be reevaluated using the Mean Retention Times of the standards. If the peaks in the affectd sample fall within the revised window, qualify the detected target compounds "NJ". If the reviewer cannot do anything with the data to resolve the problem of concern, qualify all non-detects as unusable "R". (Table 9)

9.15 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence sequence (closing CCV). (Table 9) [✓] ___ ___

Table 9. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	**Non-Detected Associated Compounds**
RT out of RT window	Use professional judgement (Sec 9.14)	
%D not within +/- 15%	J	UJ
Time elapsed greater than section 9.15 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.16 Are there any transcription/calculation errors between raw data and data summary forms? ___ [✓] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [✓] ___ ___

Yes NO N/A

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

10.3 Were the TCMX/DCB surrogate RTs for the samples within the mean surrogate RT from the initial calibration? [✓] ___ ___

Action: If no, see "Action" in section 9.14 above

11.0 Extraction Techniques for Sample Preparation

Method 8082A permits a variety of extraction techniques to be used for sample preparation. Check which extraction procedure was used?

1. Aqueous samples:

    1. Separatory funnel (Method 3510) [✓] ___ ___
    2. Continuous liquid-liquid extraction (Method 3520) [ ] ___ ___
    3. Solid phase extraction (Method 3535) [ ] ___ ___
    4. Other [ ] ___ ___

2. Solid samples:

    1. Soxhlet (Method 3540) [ ] ___ ___
    2. Automated Soxhlet (Method 3541) [ ] ___ ___
    3. Pressurized fluid (Method 3545) [ ] ___ ___
    4. Microwave extraction (Method 3546) [ ] ___ ___
    5. Ultrasonic extraction (Method 3550) [ ] ___ ___

Yes NO N/A

6. Supercritical fluid (Method 3562) [ ] ___ ___

7. Other [ ] ___ ___

11.1 Extract Cleanup - Efficiency Verification (Form IX/Equivalent)

11.1.1 Method 8082 (section 7.2) references method 3660 (sulfur) and 3665A (sulfuric acid) to use for cleaning extracts. Were one or both method used? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above. If data suggests cleanup was not performed, make note in the data assessment.

NOTE: Method 3620A, Florisil, may be used per approved project QA plan. The method does not list which analytes and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct PCB list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.2 Are all samples listed on modified CLP PCBs Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.3 Was GPC Cleanup (method 3640A) performed? [ ] ___ ✓

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.4 Were the same PCB analytes used in calibration used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.5 Are percent recoveries (% R) of the PCBs and surrogate compounds used to check the efficiency of the cleanup procedures within lab's in-house QC limits (use 70-130% if not available). [ ] ___ ✓

Yes NO N/A

70-130% for GPC calibration? [ ] ___ ___

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 70%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for PCBs. Use professional judgement to qualify positive results if recoveries are greater than the upper limit.

12.0 PCB Identification

12.1 Has CLP Form X or equivalent, showing retention time data for positive results on the two GC columns, been completed for every sample in which a PCB was detected? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and cleanup verification forms)? ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both columns/analyses? [✓] ___ ___

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

Yes NO N/A

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently.
Were there any false negatives? ___ [✓] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation provided when sample concentration was sufficient (> 10 ug/ml) in the final extract? [ ] ___ ___ ✓

ACTION: Indicate with red pencil which Form I results were confirmed by GC/MS and also note in data assessment. GC/MS confirmation is an option, see section 7.10 of Method 8082A-20. If GC/MS confirmation is not available, follow action in section 3.2.

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%~~? 40% (per method) [✓] ___ ___

NOTE: The method requires quantitation from one column. The second column is to confirm the presence of an analyte. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier

Yes NO N/A

0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected)	"NJ"
>50% (PCBs value is <CRQL)	"U"
>200%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that he higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ ✓ ___

NOTE: Single-peak PCBs results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? ✓ ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

304

SAMPLE CALCULATION

Sample ID: VWW06-SW004-0211SD
Standard ID: ICAL 2/10/11
Compound: AR1260
Concentration: 2.0 ug/L (sum of 5 peaks)
Calculation shows Peak 3: 0.39 ug/L

	Water (ug/L)	Soil (ug/Kg)
Area of Compound	140306	
CF of Compound	7567924.61	
Final Volume	2000	
Dilution Factor	1	
Split Factor	1	
Injection Volume	1	
Weight of Sample	na	
Initial Volume of Sample	960	NA
Conversion Factor	1	
Percent Solids Factor	1	
Concentration	0.03862	#DIV/0!

Peak #	Concentration
1	0.39
2	0.43
3	0.39
4	0.38
5	0.43
Total	**2.02**

Yes NO N/A

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? [✓] ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ [✓] ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for PCB analysis? [✓] ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

SW007/007P not +

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made

Yes NO N/A

to determine the proper identification of field duplicates.

	YES	NO	N/A
A.I.1 Contract Compliance Screening Report Present?	[ ]		✓ not CLP
ACTION: If no, contact RSCC/PO.			
A.I.2 Record of Communication (from RSCC) Present?	[ ]		✓
ACTION: If no, request from the RSCC.			
A.1.3 Sampling Trip Report Present and complete?	[ ]		✓
ACTION: If no, contact RSCC/PO.			
A.I.4 Chain of Custody/Sample Traffic Report Present?	✓		
Legible?	✓		
Signature of sample custodian present?	✓		
ACTION: If no, contact RSCC/WAM/PO.			
A.I.5 Cover Page Present?	✓		
Is the Cover Page properly filled in and the verbatim signed by the lab manager or the manager's designee?	✓		
Do the sample identification numbers on the Cover Page agree with sample Identification numbers on:			
(a) Traffic Report Sheet?	[ ]		✓ not CLP

	YES	NO	N/A
(b) Form I's?	[✓]	___	___
Is the number of samples on the Cover Page the same as the number of samples on the Traffic Report sheet and the Regional Record of Communication (ROC) for the data Case?	[___]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact RSCC/PO for re-submittal of the corrected Cover Page from the laboratory.

A.1.6 SDG Narrative, DC-1 & DC-2 Form

Is the SDG Narrative present?	[___]	___	___
Is Sample Log-In Sheet(Form DC-1) present and complete?	[___]	___	✓ not crp
Is Complete SDG Inventory Sheet(Form DC-2) present and complete?	[___]	___	✓

ACTION:
If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.

A.1.7 Form I to XV

A.1.7.1 Are all the Form I through Form XV labeled with:

Laboratory Name?	[✓]	___	___
Laboratory Code?	[___]	___	___
RAS/Non-RAS Case No.?	[___]	___	___
SDG No.?	[✓]	___	___

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB951454 was analyzed on 02/17/11 09:12. The following analyte(s) were detected below RL: Manganese at -0.68 UG/L.
CCB951461 was analyzed on 02/17/11 11:57. The following analyte(s) were detected below RL: Iron at 8.73 UG/L, Manganese at -0.643 UG/L.
CCB951473 was analyzed on 02/17/11 12:55. The following analyte(s) were detected below RL: Iron at 11.4 UG/L, Manganese at -0.616 UG/L.
CCB951485 was analyzed on 02/17/11 13:50. The following analyte(s) were detected below RL: Iron at 11.1 UG/L, Magnesium at 12.2 UG/L, Manganese at -0.613 UG/L.
CCB951497 was analyzed on 02/17/11 14:51. The following analyte(s) were detected below RL: Aluminum at 13.9 UG/L, Beryllium at 0.141 UG/L, Iron at 14.8 UG/L, Magnesium at 11.7 UG/L, Manganese at -0.577 UG/L.

Revised

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

CCB951509 was analyzed on 02/17/11 15:57. The following analyte(s) were detected below RL: Iron at 10.3 UG/L, Manganese at -0.619 UG/L, Vanadium at 0.672 UG/L.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350197702ADL1 was analyzed (at a 100X dilution) with the water samples on 02/18/11. The following analyte(s) were recovered above criteria: Sodium at 131.5 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the parent sample containing a saturated amount of Sodium. No further action was taken.

3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW004-0211MS was analyzed (at a 20X dilution) with the water samples on 02/17/11. The following analyte(s) were recovered below criteria: Calcium at 0 % with criteria of (80-120), Selenium at 73.4 % with criteria of (80-120), Thallium at 77.4 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 126.3 % with criteria of (80-120), Beryllium at 120.6 % with criteria of (80-120), Iron at 129.2 % with criteria of (80-120), Magnesium at 400 % with criteria of (80-120), Potassium at 204 % with criteria of (80-120).

MS - VWW06-SW004-0211MSDL1 was analyzed (at a 100X dilution) with the water samples on 02/18/11. The following analyte(s) were recovered below criteria: Sodium at 0 % with criteria of (80-120).

SD - VWW06-SW004-0211SD was analyzed (at a 20X dilution) with the water samples on 02/17/11. The following analyte(s) were recovered below criteria: Calcium at 0 % with criteria of (80-120), Selenium at 75.8 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 147.7 % with criteria of (80-120), Barium at 125.6 % with criteria of (80-120), Beryllium at 131.8 % with criteria of (80-120), Iron at 149.2 % with criteria of (80-120), Magnesium at 800 % with criteria of (80-

Revised JC

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

120), Potassium at 388 % with criteria of (80-120), Vanadium at 122.9 % with criteria of (80-120).

SD - VWW06-SW004-0211SDDL1 was analyzed (at a 100X dilution) with the water samples on 02/18/11. The following analyte(s) were recovered below criteria: Sodium at 0 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the parent sample being saturated with Sodium and diluted out at a 20X and 100X dilutions. The sample required dilutions to get the Internal Standard to pass and required dilutions for Sodium. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350197702L was analyzed with the water samples on 02/17/11. The following analyte(s) exceeded criteria: Aluminum at 190 % with criteria of (10), Calcium at 11 % with criteria of (10), Magnesium at 59 % with criteria of (10).

Serial Dilution 350197702LDL1 was analyzed with the water samples on 02/18/11. The following analyte(s) exceeded criteria: Sodium at 35 % with criteria of (10). The most probable cause for the SD exceeding limits is sample matrix due to the parent sample containing a saturated amount of Sodium. No further action was taken.
Samples coded accordingly.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW003-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW003-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW004-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 20X dilution with the passing Internal Standard.

Revised JAC

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Sample VWW06-SW004-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW005-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW005-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW006-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW006-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW007-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW007-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW007R-0211 required a 20X dilution. The sample required a 20X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 20X dilution with the passing Internal Standard.

Sample VWW06-SW007R-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 04/18/2011

Revised JAC

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7470A.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7470A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350197702A was analyzed with the water samples on 02/09/11. The following analyte(s) were recovered below criteria: Mercury at

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

67.1 % with criteria of (80-120). Since the LCS/LCSD pass all quality control criteria, sample matrix suspected for the PDS exceeding limits. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW004-0211MS was analyzed with the water samples on 02/09/11. The following analyte(s) were recovered below criteria: Mercury at 62 % with criteria of (80-120).

SD - VWW06-SW004-0211SD was analyzed with the water samples on 02/09/11. The following analyte(s) were recovered below criteria: Mercury at 64.7 % with criteria of (80-120). Since the LCS/LCSD pass all quality control criteria, sample matrix suspected for the MS/MSD exceeding limits. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/04/2011

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. **Calibration Blanks:**
All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB951454 was analyzed on 02/17/11 09:12. The following analyte(s) were detected below RL: Manganese at -0.68 UG/L.
CCB951497 was analyzed on 02/17/11 14:51. The following analyte(s) were detected below RL: Aluminum at 13.9 UG/L, Beryllium at 0.141 UG/L, Iron at 14.8 UG/L, Magnesium at 11.7 UG/L, Manganese at -0.577 UG/L.
CCB951509 was analyzed on 02/17/11 15:57. The following analyte(s) were detected below RL: Iron at 10.3 UG/L, Manganese at -0.619 UG/L, Vanadium at 0.672 UG/L.
CCB951521 was analyzed on 02/17/11 16:52. The following analyte(s) were detected below RL: Iron at 8.59 UG/L, Manganese at -0.634 UG/L.
CCB951533 was analyzed on 02/17/11 17:53. The following analyte(s) were detected below RL: Iron at 12.9 UG/L, Manganese at -0.606 UG/L.
CCB951534 was analyzed on 02/17/11 17:56. The following analyte(s) were detected below RL: Manganese at -0.682 UG/L.

Reviewed JAC

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

CCB951546 was analyzed on 02/17/11 18:55. The following analyte(s) were detected below RL: Aluminum at 11.3 UG/L, Iron at 14.8 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Method Blanks:**

All acceptance criteria were met with the exception of:
Blank 70364MB was analyzed with the water samples on 02/18/11. The following analyte(s) were detected below RL: Aluminum at 16.1 UG/L. The hit in the blank is below the RL, therefore, no corrective action was taken. Samples coded accordingly.

C. **Spikes:**

1. **Laboratory Control Spikes (LCS):**

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. **Post Digestion Spike:**

All acceptance criteria were met with the exception of:
Post Digestion Spike 350197702A was analyzed with the water samples on 02/17/11. The following analyte(s) were recovered above criteria: Magnesium at 123.2 % with criteria of (80-120), Selenium at 125.3 % with criteria of (80-120).

Post Digestion Spike 350197702ADL1 was analyzed with the water samples on 02/18/11. The following analyte(s) were recovered above criteria: Sodium at 148.2 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the parent sample containing a saturated amount of Sodium. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW004-0211MS was analyzed (at a 20X dilution) with the water samples on 02/17/11. The following analyte(s) were recovered above criteria: Calcium at 284 % with criteria of (75-125), Magnesium at 740 % with criteria of (75-125), Potassium at 272 % with criteria of (75-125).

MS - VWW06-SW004-0211MSDL1 (at a 100X dilution) was analyzed with the water samples on 02/18/11. The following analyte(s) were recovered below criteria: Sodium at 0 % with criteria of (75-125).

SD - VWW06-SW004-0211SD was analyzed (at a 20X dilution) with the water samples on 02/17/11. The following analyte(s) were recovered below criteria: Selenium at 65.2 % with criteria of (75-125), Zinc at 73.6 % with

Revised JAC

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

criteria of (75-125) and the following analyte(s) were recovered above criteria: Calcium at 218 % with criteria of (75-125), Magnesium at 460 % with criteria of (75-125), Potassium at 200 % with criteria of (75-125).

SD - VWW06-SW004-0211SDDL1 was analyzed (at a 100X dilution) with the water samples on 02/18/11. The following analyte(s) were recovered below criteria: Sodium at 0 % with criteria of (75-125). The following analyte(s) exceeded RPD criteria: Sodium at 28.1 % with criteria of (20). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the parent sample being saturated with Sodium and diluted out at a 20X and 100X dilutions. The sample required dilutions to get the Internal Standard to pass and required dilutions for Sodium. No further action was taken. Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW003-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported form the 20X dilution with the passing Internal Standard.

Sample VWW06-SW003-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW004-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported form the 20X dilution with the passing Internal Standard.

Sample VWW06-SW004-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW005-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported form the 20X dilution with the passing Internal Standard.

Revised JAC

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Sample VWW06-SW005-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW006-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported form the 20X dilution with the passing Internal Standard.

Sample VWW06-SW006-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW007-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported form the 20X dilution with the passing Internal Standard.

Sample VWW06-SW007-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW007R-0211 required a 20X dilution. The sample required a 20X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported form the 20X dilution with the passing Internal Standard.

Sample VWW06-SW007R-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 04/18/2011

Revised JAC

CASE NARRATIVE
MERCURY
DISSOLVED

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7470A.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7470A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350197702A was analyzed with the water samples on 02/10/11. The following analyte(s) were recovered below criteria: Mercury at

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

63.4 % with criteria of (80-120). Since the LCS/LCSD pass all quality control criteria, the most probable cause for the PDS exceeding limits is sample matrix. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW004-0211MS was analyzed with the water samples on 02/10/11. The following analyte(s) were recovered below criteria: Mercury at 67.3 % with criteria of (80-120).

SD - VWW06-SW004-0211SD was analyzed with the water samples on 02/10/11. The following analyte(s) were recovered below criteria: Mercury at 68.6 % with criteria of (80-120). Since the LCS/LCSD pass all quality control criteria, the most probable cause for the MS/MSD exceeding limits is sample matrix. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

CASE NARRATIVE
MERCURY
DISSOLVED

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/04/2011

W:\Narratives\Metals\3501\3501977_7470_D.doc

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : PEL Laboratories Inc.

Project: Vieques

Laboratory Workorder / SDG #: K0201

SW846 6020A

I. SAMPLE RECEIPT

No exceptions or unusual conditions were encountered unless a Sample Condition Notification Form, or other record of communication is included with the Sample Receipt Documentation.

Samples were analyzed for total and dissolved (field filtered) metals. Results are reported in two sub-SDGs, with SK0201 for total metals, and SK0201-D for dissolved metals. Raw data for both sub-SDGs are included following the last Form 15 for the dissolved metals sub-SDG.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

III. METHODS

Samples were analyzed following procedures in laboratory test code: SW846 6020A

IV. PREPARATION

Aqueous Samples were prepared following procedures in laboratory test code: ICP_MS_W_PR(3005A)

V. INSTRUMENTATION

The following instrumentation was used to perform
Instrument Code: X1
Instrument Type: ICPMS
Description: X1
Manufacturer: ThermoFisher
Model: X-Series 2

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

Method blanks were within the acceptance criteria.

C. Spikes:

1. Laboratory Control Spikes (LCS):

Percent recoveries for lab control samples were within the QC limits.

2. Matrix spike (MS):

Matrix spikes were performed on samples: VWW06-SW004-0211 (K0201-02AMS) and VWW06-SW004-0211 (K0201-02BMS). Percent recoveries were within the QC limits with the following exceptions:
VWW06-SW004-0211 (K0201-02AMS), Spike sample recovery is not within control limits for Chromium at 146% with criteria of (75-125), Antimony at 0% with criteria of (75-125) and Arsenic at 0% with criteria of (75-125) due to high dilutions causing the spike concentration to be over-diluted.
VWW06-SW004-0211 (K0201-02BMS-DISS), Spike sample recovery is not within control limits for Chromium at 136% with criteria of (75-125), for Antimony at 0% with criteria of (75-125) and Arsenic at 0% with criteria of (75-125) due to high dilutions causing the spike concentration to be over-diluted.

D. Post Digestion/Distillation Spike (PDS):

No PDS analyses were included in this SDG since the spike percent recovery failures were due to the high dilution required.

E. Duplicate sample:

Duplicate analyses were performed on samples: VWW06-SW004-0211 (K0201-02ADUP) and VWW06-SW004-0211 (K0201-02BDUP). Relative percent differences were within the QC limits.

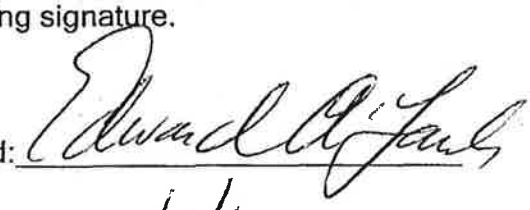
F. Serial Dilution (SD):

Serial Dilution analyses were performed on samples: VWW06-SW004-0211 (K0201-02AMS) and VWW06-SW004-0211 (K0201-02BMS).
Percent differences were within the QC limits.

G. Samples:

All samples required analysis at a 50X, 100X or 500X dilution due to the high Sodium content, internal standard interference, and to protect the instrument. The lowest dilution was reported for each element based on the recoveries of the associated internal standards.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed: 

Date: 3/4/11

		YES	NO	N/A
	Contract No.?	☑		

ACTION:
If no for any of the above, note under Contract Problem/Non-Compliance Section of the "Data Review Narrative" and contact PO for corrected Form(s) from the laboratory.

A.1.7.2 After comparing values on Forms I-IX against the raw data, do any computation/ transcription errors exceed 10% of the reported values on the Forms for:

(a) all analytes analyzed by ICP-AES?		☑	
(b) all analytes analyzed by ICP-MS?		☑	
(c) Mercury?		☑	
(d) Cyanide?			☑

ACTION:
If yes, prepare Telephone Record Log and contact CLP PO/TOPO for the corrected data from the laboratory.

A.1.8 Raw Data

Data shall not be validated without the hard/electronic copies of the associated raw data for samples and QC samples.

A.1.8.1 Digestion/Distillation Log

Digestion Log for ICP-AES (Form XII)present?	☑		
Digestion Log for ICP-MS (Form XII) present?	☑		
Digestion Log for mercury (Form XII) present?	☑		
Distillation Log for cyanide (Form XII) present?			☑

Are pH values for metals and

	YES	NO	N/A
cyanide reported for each aqueous sample?	☑		
Are percent solids calculations present for soils/sediments? (Datum waters only)		✓	
Are preparation dates present on the sample preparation logs/bench sheets?	☑		

NOTE:
Digestion/Distillation log must include weights, volumes, and dilutions used to obtain the reported results.

A.1.8.2 Is the analytical instrument real-time printouts present for:

	YES	NO	N/A
ICP-AES?	☑		
ICP-MS?	☑		
Mercury?	☑		
Cyanide?			✓

Are all laboratory bench sheets and instrument raw data printouts necessary to support all sample analyses and QC operations:

	YES	NO	N/A
Legible?	☑		
Properly labeled?		✓	

Are all field samples, QC samples and field QC samples present on:

	YES	NO	N/A
Digestion/Distillation log?	☑		
Instrument Printouts?	☑		

ACTION:
If no for any of the above questions in Section A.1.8.1 and Section A.1.8.2, write Telephone Record Log and contact TOPO/PO for re-submittal from the laboratory.

	YES	NO	N/A

A.1.9 **Technical Holding Times**: (Aqueous and soil samples)

(Examine sample Traffic Reports and digestion/distillation logs to determine the holding time from the sample collection date to the sample preparation date.)

A.1.9.1 Cyanide distillation(14 days)exceeded? _ [ ] ✓

Mercury analysis(28 days) exceeded? _ [✓] _

Other Metals analysis(180 days)exceeded? ___ ___ [✓] _

ACTION:
If yes, reject (R) and red-line non-detects and flag as estimated (J)results ≥ MDL even if sample(s) was preserved properly.

NOTE:
In addition to qualifying the data, a list of all samples and analytes which exceeded the holding times must be prepared. Report for each sample the number of days that were exceeded. (Subtract the sample collection date from the sample preparation date). Attach this list to the data review narrative.

A.1.9.2 Is pH of aqueous samples for:

Metals Analysis ≤ 2? [✓] ___ ___

Cyanide Analysis ≥ 12? [ ] _ _ ✓

ACTION:
If no for any of the above, flag non-detects as "R" and detects as "J".

A.1.9.3 Is the cooler temperature ≤ 10 C°? [✓] _ _

ACTION:
If cooler temperature is >10 °C , flag non-detects as "UJ" and detects as "J".

A.1.10 **Final Data Correctness - Form I**

A.1.10.1 Are Form I's for all samples

CH2M HILL VIEQUES CTO-111

METALS CALCULA

SDG 3501977/K0201/K0201D

ICP - AES Total	
SAMPLE ID	VWW06-SW007P-0211
ANALYTE	magnesium
Lab Value CONCENTRATION (ug/L)	1160000
AMOUNT FROM RAW DATA (ug/L)	57800
SAMPLE SIZE (ml)	50
FINAL VOLUME (L)	50
DILUTION FACTOR	20
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	1156000

FIMS Dissolved	
SAMPLE ID	VWW06-SW004-0211SD
ANALYTE	mercury
Lab Value CONCENTRATION (ug/L)	2.06
AMOUNT FROM RAW DATA (ug/L)	2.06
SAMPLE SIZE (ml)	25
FINAL VOLUME (ml)	25
DILUTION FACTOR	1
DRYNESS FACTOR	1
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	2.060

ICP-MS	
SAMPLE ID	VWW06-SW004-0211
ANALYTE	Lead
Lab Value CONCENTRATION (ug/L)	9.3
AMOUNT FROM RAW DATA (ug/L)	0.093
SAMPLE SIZE (ml)	50
FINAL VOLUME (ml)	50
DILUTION FACTOR	100
DRYNESS FACTOR	1
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	9.3

	YES	NO	N/A
present and complete?	[✓]	___	___

ACTION:
If no, prepare Telephone Record Log and contact CLP PO/TOPO for submittal from the laboratory.

A.1.10.2 Verify there are no calculation and transcription errors in the results reported on Form I's. Circle on each Form I all results that are incorrect.

Is the calculation error less than 10% of the correct result?	[✓]	___	___
Are results on Form I's reported in correct units (ug/L for aqueous and MG/KG for soils)?	[✓]	___	___
Are results on Form I'S reported by correct significant figures?	[✓]	___	___
Are soil sample results on Form I's corrected for percent solids?	[___]	___	✓
Are all "less than MDL" values reported by the ~~CRQLs~~ and coded with "U"?	[✓]	___	___
Are values less than the ~~CRQLs~~ LOQs but greater than or equal to the MDLs flagged with "J"? (LOD's per SAP)	[✓]	___	___
Are appropriate contractual quality control and Method qualifiers used?	[✓]	___	___

ACTION:
If no for any of the above questions, prepare Telephone Record Log, and contact CLP PO/TOPO for corrected data.

A.1.10.3 Do EPA sample identification numbers and the corresponding laboratory sample identification numbers match on the Cover Page, Form I's and in the raw data? [✓] ___ ___

Was a brief physical description

		YES	NO	N/A
	of the samples before and after digestion given on the Form I's?	[___]	✓	—
	Was any sample result outside the mercury/cyanide calibration range or the ICP-AES/ICP-MS linear range diluted and noted on the Form I?	[✓]	✓	—
	ACTION: If no for any of the above, note under the Contract-Problem/Non-Compliance Section of the Data Review Narrative.	many dilutions - not noted on Form Is		
A.1.11	**Initial Calibration**			
A.1.11.1	Is a record of at least 2 point (A blank and a standard)calibration present for ICP-AES analysis?	[✓]	—	—
	Is a record of at least 2 point (a blank and a standard)calibration present for ICP-MS analysis?	[✓]	—	—
	Is a record of at least 5 point calibration (a blank & 4 standards)present for Hg analysis?	[✓]	—	—
	Is a record of at least 4 point calibration (a blank & 4 standards)present for cyanide?	[___]	—	✓
	ACTION: If incomplete or no initial calibration was performed, reject (R) and red-line the associated data (detects & non-detects).			
	Is one initial calibration standard at the CRQL level for cyanide and mercury?	[✓]	—	—
	ACTION: If no, write in the Contract Problem/ Non-Compliance Section of the Data Review Narrative.			
A.1.11.2	Is the curve correlation coefficient $\geq$ 0.995 for:			

		YES	NO	N/A
	Mercury Analysis?	[✓]	___	___
	Cyanide Analysis?	[✓]	___	___
	ICP-AES (more than 2 point Calib.)?	[']	___	✓
	ICP-MS (more than 2 point calib.)?	[✓]	___	___

ACTION:
If no, qualify the associated sample results ≥ MDL as estimated "J" and non-detects as "UJ".

NOTE:
The correlation coefficient shall be calculated by the data validator using standard concentrations and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.12 Initial and Continuing Calibration Verification- Form IIA

A.1.12.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for ICP-AES and ICP-MS when both these methods were used for the same analyte?	[✓]	___	___

ACTION:
If no for any of the above, prepare a Telephone Record Log and contact PO/TOPO for re-submittal from the laboratory.

A.1.12.2	Was a Continuing Calibration Verification performed every 10 samples or every 2 hours whichever is more frequent?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.12.3	Was an ICV or a mid-range standard distilled and analyzed with each batch of cyanide samples?	[']	___	✓

	YES	NO	N/A

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative and qualify results ≥ MDL as estimated (J).

A.1.12.2 Circle on each Form IIA all percent recoveries that are outside the contract windows.

Are ICV/CCVs within control limits for:

Metals - 90-110%R?	[✓]	___	___
Hg - 80-120%R?	[✓]	___	___
Cyanide - 85-115%R?	[___]	___	✓

ACTION:
If no, qualify all samples between a previous technically acceptable CCV standard and a subsequent technically acceptable CCV standard as follows as follows:

Qualify as estimated (J) all detects and non-detects, if the ICV/CCV %R is between 75-89%(65-79% for Hg; 70-84% for CN). Qualify only positive results(≥ MDL) as "J" if the ICV/CCV %R is between 111-125%(121-135% for Hg;116-130% for CN). Reject (R) and red-line only detects if the recovery is greater than 125% (135% for Hg; 130% for CN). Reject (R) and red-line all associated results (hits and non-detects)if the recovery is less than 75%(65% for Hg;70% for CN).

NOTE:
For ICV that does not fall within the acceptance limits, qualify all samples reported from the analytical run.

A.1.12.3 Was the distilled ICV or mid-range standard for cyanide within acceptance limits (85-115%)? [___] ___ ✓

ACTION:
If no, Qualify all cyanide results ≥ MDL as "J".

A.1.13 **CRQL Standard Analysis - Form IIB**

A.1.13.1 For each ICP-AES run, was a CRI

	YES	NO	N/A
(CRQL or MDL when MDL > CRQL) standard analyzed? **(Note:CRI is not required for Al, Ba, Ca, Fe, Mg, Na and K.)**	[✓]	___	___
For each ICP-MS run, was a CRI (CRQL or MDL when MDL > CRQL) standard analyzed for each mass/isotope used for the analysis? lab provided a spread sheet tabulating results.	[✓]	___	___
For each mercury run, was a CRQL standard analyzed? lab ran a ICAL Std at RL that meets 70-130	[___]	___	___
For each cyanide run, was a CRQL standard analyzed? No action Required	[___]	___	___

ACTION:
If no for any of the above, write this deficiency in the Contract Problems/ Non-Compliance Section of the Data Review Narrative, inform CLP PO and flag results in the affected ranges (detects <2xCRQL)as J and non-detects UJ.

The affected ranges are:
ICP-AES Analysis - *True Value ± CRQL
ICP-MS Analysis - *True Value ± CRQL
Mercury Analysis - *True Value ± CRQL
Cyanide Analysis - *True Value ± CRQL
*** True value of the CRQL Standard**

A.1.13.2 Was a CRQL standard analyzed after the ICV/ICB, before the final CCV/CCB and once every 20 analytical samples in the analytical run for each analysis? analyzed per method at beginning of run only [___] ___ ___

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the "Data Review Narrative".

A.1.13.3 Circle on each Form IIB all percent recoveries that are outside the acceptance windows.

Jacqueline Cleveland

From: Edward Lawler [Mitkem] [elawler@mitkem.com]
Sent: Wednesday, April 13, 2011 1:28 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020
Attachments: PEL_VIEQUES-LLICV.metals.xls

Jackie—

Attached is an Excel file containing all the Low Level ICVs (LLICVs) for the Vieques SDGs for Method 6020.

This is right out of our database. There is a separate section of the spreadsheet for each ICP/MS run, also identifying which Mitkem SDGs were analyzed in that run.

These data probably include extra elements, which were included for other samples analyzed in the same run.

Please let me know if you have any questions, or need any additional information.

--Ed

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 6:27 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Thanks Ed,

I will wait for the summary pages!

Jackie

From: Edward Lawler [Mitkem] [mailto:elawler@mitkem.com]
Sent: Tuesday, April 12, 2011 4:03 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Hi Jackie—

That check standard is included in all of the SDGs. We call it the Low Level ICV (or LLICV). Our CLP-type inorganics data reporting software doesn't have a form to report these on, so they are included in the raw data for each SDG, but not on the reporting forms.

For example, in Mitkem SDG K0204, the LLICV is listed as the 10th run on page 0064, and the raw data for this run are on page 0092—but this data is somewhat difficult to follow.....

We are working on something to get you the summaries of %recoveries, which I will hopefully have to you tomorrow.

--Ed

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:25 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU 6 Metals by 6020

Good Afternoon Ed,

I am doing data validation for CH2M HILL for the Vieques SWMU 6 data for which you were subcontracted to perform the 6020 metals analyses. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects Work Order #s K0204, K0225, K0205, K0201 & K0215. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

K0204 X1_110223A

A?	S?	Analyte	RawVal	RawSpk	CalcVal	FinalVal	Spike	%MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Arsenic	2.30064728	2	2.30064728	2.3	2	0.19	0.5	2	115.03%		70	130
A	Y	Chromium	2.01545733	2	2.01545733	2	2	0.16	0.5	2	100.77%		70	130
A	Y	Selenium	5.66130075	5	5.66130075	5.7	5	0.15	0.5	5	113.23%		70	130

K0201 X1_110216B

A?	S?	Analyte	RawVal	RawSpk	CalcVal	FinalVal	Spike	%MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Aluminum	21.0027562	20	21.0027562	21	20	2.9	5	20	105.01%		70	130
A	Y	Antimony	2.12426401	2	2.12426401	2.1	2	0.2	0.2	2	106.21%		70	130
A	Y	Arsenic	2.00593914	2	2.00593914	2	2	0.19	0.5	2	100.30%		70	130
A	Y	Barium	10.0122643	10	10.0122643	10	10	1.3	3	10	100.12%		70	130
A	Y	Beryllium	1.00140666	1	1.00140666	1	1	0.072	0.2	1	100.14%		70	130
A	Y	Cadmium	1.00829914	1	1.00829914	1	1	0.084	0.2	1	100.83%		70	130
A	Y	Calcium	472.76306	500	472.76306	470	500	24	38	500	94.55%	J	70	130
A	Y	Chromium	2.03706028	2	2.03706028	2	2	0.16	0.5	2	101.85%		70	130
A	Y	Cobalt	1.06535199	1	1.06535199	1.1	1	0.024	0.1	1	106.54%		70	130
A	Y	Copper	2.15205123	2	2.15205123	2.2	2	0.23	0.6	5	107.60%	J	70	130
A	Y	Iron	192.148667	200	192.148667	190	200	14	40	200	96.07%	J	70	130
A	Y	Lead	0.97907404	1	0.97907404	0.98	1	0.068	0.2	1	97.91%	J	70	130
A	Y	Magnesium	527.600786	500	527.600786	530	500	7.8	12	500	105.52%		70	130
A	Y	Manganese	5.4470818	5	5.4470818	5.4	5	0.83	1	5	108.94%		70	130
A	Y	Nickel	1.0502218	1	1.0502218	1.1	1	0.17	0.25	1	105.02%		70	130
A	Y	Potassium	484.529478	500	484.529478	480	500	14	40	500	96.91%	J	70	130
A	Y	Selenium	5.36275801	5	5.36275801	5.4	5	0.15	0.5	5	107.26%		70	130
A	Y	Silver	1.01190753	1	1.01190753	1	1	0.022	0.05	1	101.19%		70	130
A	Y	Sodium	487.672118	500	487.672118	490	500	33	50	500	97.53%	J	70	130
A	Y	Thallium	0.9840832	1	0.9840832	0.98	1	0.048	0.1	1	98.41%	J	70	130
A	Y	Vanadium	5.4149342	5	5.4149342	5.4	5	0.61	1	5	108.30%		70	130
A	Y	Zinc	5.54426374	5	5.54426374	5.5	5	0.73	1	5	110.89%		70	130

K0201, K0205 X1_110217B

A?	S?	Analyte	RawVal	RawSpk	CalcVal	FinalVal	Spike	%MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	2.07949727	2	2.07949727	2.1	2	0.2	0.2	2	103.97%		70	130
A	Y	Arsenic	2.00792532	2	2.00792532	2	2	0.19	0.5	2	100.40%		70	130
A	Y	Cadmium	0.9580971	1	0.9580971	0.96	1	0.084	0.2	1	95.81%	J	70	130
A	Y	Chromium	1.84630224	2	1.84630224	1.8	2	0.16	0.5	2	92.32%	J	70	130
A	Y	Cobalt	0.98179571	1	0.98179571	0.98	1	0.024	0.1	1	98.18%	J	70	130
A	Y	Copper	1.81974453	2	1.81974453	1.8	2	0.23	0.6	5	90.99%	J	70	130
A	Y	Lead	0.95434051	1	0.95434051	0.95	1	0.068	0.2	1	95.43%	J	70	130
A	Y	Silver	0.97534637	1	0.97534637	0.98	1	0.022	0.05	1	97.53%	J	70	130

K0215, K0225 **X1_110222A**

A	Y	Antimony	1.8964567	2	1.8964567	1.9	2	0.2	0.2	2	94.82%	J	70	130
A	Y	Arsenic	2.13301722	2	2.13301722	2.1	2	0.19	0.5	2	106.65%		70	130
A	Y	Barium	10.7561986	10	10.7561986	11	10	1.3	3	10	107.56%		70	130
A	Y	Beryllium	1.03423982	1	1.03423982	1	1	0.072	0.2	1	103.42%		70	130
A	Y	Cadmium	1.04382134	1	1.04382134	1	1	0.084	0.2	1	104.38%		70	130
A	Y	Chromium	1.87146555	2	1.87146555	1.9	2	0.16	0.5	2	93.57%	J	70	130
A	Y	Cobalt	1.06305979	1	1.06305979	1.1	1	0.024	0.1	1	106.31%		70	130
A	Y	Copper	2.20898143	2	2.20898143	2.2	2	0.23	0.6	5	110.45%	J	70	130
A	Y	Iron	195.167776	200	195.167776	200	200	14	40	200	97.58%	J	70	130
A	Y	Lead	1.0698727	1	1.0698727	1.1	1	0.068	0.2	1	106.99%		70	130
A	Y	Nickel	1.01332509	1	1.01332509	1	1	0.17	0.25	1	101.33%		70	130
A	Y	Selenium	5.56241436	5	5.56241436	5.6	5	0.15	0.5	5	111.25%		70	130
A	Y	Silver	1.00087559	1	1.00087559	1	1	0.022	0.05	1	100.09%		70	130
A	Y	Thallium	1.07403596	1	1.07403596	1.1	1	0.048	0.1	1	107.40%		70	130
A	Y	Vanadium	5.44821072	5	5.44821072	5.4	5	0.61	1	5	108.96%		70	130
A	Y	Zinc	5.63784043	5	5.63784043	5.6	5	0.73	1	5	112.76%		70	130

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Wednesday, April 13, 2011 11:08 AM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU6

Jackie:

Good afternoon.

Per our QAO:
The mercury procedures were reviewed. The calibration curve is digested with every batch analyzed. The low cal standard is at 0.2ug/L which is the Reporting Limit.
PEL does not check an LLQC sample regularly at this time but as the low cal standard is at the RL and carried through the entire process any raw data from a cal curve could be used to verify an LLQC.
Using the Raw Data from the regular Hg analysis for SDG 3501977 the recovery for the low cal standard, 0.2ug/L, yielded a 78.3% recovery, meeting the +/-30% criteria.

For example on SDG 3501977, CS1 data can be found in the metals raw data section on page 4531.

Please let me know if you have any questions or concerns.

Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:35 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU6

Good Afternoon John,

I have a request regarding the mercury analysis. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects all 5 SDGs. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. If the standards are there and I am just missing them let me know! Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

	YES	NO	N/A
Is the CRQL standard within control limits for:			
Metals(ICP-AES/ICP-MS)- 70 - 130%?	[✓]	___	___
Mercury- 70 - 130%?	[✓]	___	___
Cyanide - 70 - 130%?	[___]	___	✓

ACTION:
If no, flag detects <2xCRQL as "J" and non-detects as "UJ" if the CRQL standard recovery is between 50-69%. Flag(J) only detects <2xCRQL if the recovery is between 131% and ≤180%. If the recovery is less than 150%, reject(R) and red-line non-detects and detects < 2xCRQL, and flag (J) detects between 2xCRQL and ICV/CCV. Reject and red-line only detects <2xCRQL and flag (J)detects ≥ 2xCRQL but < ICV/CCV if the recovery is > 180%.

NOTE:
1. Qualify all field samples analyzed between a previous technically acceptable analysis of the CRQL standard and a subsequent acceptable analysis of the CRQL standard
2. Flag (J) or reject (R) only the final sample results on Form I's when Sample raw data are within the affected ranges and the CRQL standard is outside the acceptance windows.
3. The samples and the CRQL standard must be analyzed in the same analytical run.

A.1.14 Initial and Continuing Calibration Blanks - Form III

		YES	NO	N/A
A.1.14.1	Present and complete for all the instruments used for the metals and cyanide analyses?	[✓]	___	___
	Was an initial Calibration Blank analyzed after ICV?	[✓]	___	___
	Was a continuing Calibration Blank analyzed after every CCV and every 10 samples or every 2 hours, whichever is more frequent?	[✓]	___	___
	Were the ICB & CCB values ≥ MDL but < CRQL reported on Form III and flagged "J" by			

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	100	U	65.8	J	100	U	100	U	18.6	U	P
Barium	10	U	10	U	10	U	10	U	0.44	U	P
Beryllium	3.65	U	0.18	J	3.65	U	3.65	U	0.24	U	P
Calcium	100	U	62.2	J	100	U	100	U	78	U	P
Iron	40	U	64.4	=	8.73	J	11.4	J	11	U	P
Magnesium	100	U	59.7	J	100	U	100	U	19.6	U	P
Manganese	-0.68	J	-0.578	J	-0.643	J	-0.616	J	0.7	U	P
Mercury	0.2	U	0.2	U					0.074	U	CV
Nickel	4.1	U	4.1	U	4.1	U	4.1	U	1.86	U	P
Potassium	500	U	500	U	500	U	500	U	143	U	P
Selenium	9	U	9	U	9	U	9	U	8.2	U	P
Sodium	300	U	300	U	300	U	300	U	300	U	P
Thallium	10	U	10	U	10	U	10	U	8.8	U	P
Vanadium	9	U	9	U	9	U	9	U	0.88	U	P
Zinc	20	U	20	U	20	U	20	U	8	U	P

none assoc SW004 SW005 SW005DL

ICB IDs: CV= ICB948017, P= ICB951454

CCB1 IDs: CV= CCB948019, P= CCB951459

CCB2 IDs: P= CCB951461

CCB3 IDs: P= CCB951473

090311 1734

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C	5	C	6 ✓	C	Prepa-ration Blank	C	M
Aluminum			100	U	13.9	J	100	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	0.141	J	3.65	U			P
Calcium			100	U	100	U	100	U			P
Iron			11.1	J	14.8	J	10.3	J			P
Magnesium			12.2	J	11.7	J	100	U			P
Manganese			-0.613	J	-0.577	J	-0.619	J			P
Mercury	0.2	U	0.2	U							CV
Nickel			4.1	U	4.1	U	4.1	U			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	10	U	10	U			P
Vanadium			9	U	9	U	0.672	J			P
Zinc			20	U	20	U	20	U			P

NQ NQ NQ NQ

SW005 SW005DL SW006 SW006DL SW003 SW003DL SW007 SW007DL SW007P SW007PDL

ICB IDs: CV= ICB948028

CCB1 IDs: CV= CCB948030, P= CCB951485

CCB2 IDs: P= CCB951497

CCB3 IDs: P= CCB951509

✓ flag U at LOD all >MDL ≤ LOD in all assoc. field Samples

090311 1734

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501977

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	100	U	65.8	J	100	U	100	U	16.1	J	P
Barium	10	U	10	U	10	U	10	U	0.44	U	P
Beryllium	3.65	U	0.18	J	3.65	U	3.65	U	0.24	U	P
Calcium	100	U	62.2	J	100	U	100	U	78	U	P
Iron	40	U	64.4	=	8.73	J	11.4	J	11	U	P
Magnesium	100	U	59.7	J	100	U	100	U	19.6	U	P
Manganese	-0.68	J	-0.578	J	-0.643	J	-0.616	J	0.7	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.074	U	CV
Nickel	4.1	U	4.1	U	4.1	U	4.1	U	1.86	U	P
Potassium	500	U	500	U	500	U	500	U	143	U	P
Selenium	9	U	9	U	9	U	9	U	8.2	U	P
Sodium	300	U	300	U	300	U	300	U	300	U	P
Thallium	10	U	10	U	10	U	10	U	8.8	U	P
Vanadium	9	U	9	U	9	U	9	U	0.88	U	P
Zinc	20	U	20	U	20	U	20	U	8	U	P

NQ

none assoc

ICB IDs: CV= ICB948529, P= ICB951454

CCB1 IDs: CV= CCB948531, P= CCB951459

CCB2 IDs: CV= CCB948543, P= CCB951461

CCB3 IDs: CV= CCB948555, P= CCB951473

090311 1735

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C	5	C	6	C	Prepa-ration Blank	C	M
Aluminum			100	U	13.9	J	NQ 100	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	0.141	J	✓ 3.65	U			P
Calcium			100	U	100	U	100	U			P
Iron			11.1	J	14.8	J	NQ 10.3	J ✓			P
Magnesium			12.2	J	11.7	J	100	U			P
Manganese			-0.613	J	-0.577	J	NQ -0.619	J	NQ		P
Mercury			0.2	U							CV
Nickel			4.1	U	4.1	U	4.1	U			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	10	U	10	U			P
Vanadium			9	U	9	U	0.672	J	NQ		P
Zinc			20	U	20	U	20	U			P

SW004 SW005 SW005DL

none assoc.

ICB IDs:

CCB1 IDs: CV= CCB948559, P= CCB951485

CCB2 IDs: P= CCB951497

CCB3 IDs: P= CCB951509

✓ flag U at LOD all >MDL ≤ LOD in assoc. field samples.

090311 1735

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 7	C	8	C	9	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	3.65	U	3.65	U			P
Calcium			100	U	100	U	100	U			P
Iron			8.59	J	12.9	J	40	U			P
Magnesium			100	U	100	U	100	U			P
Manganese			-0.634	J	-0.606	J	-0.682	J			P
Mercury											CV
Nickel			4.1	U	4.1	U	4.1	U			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	10	U	10	U			P
Vanadium			9	U	9	U	9	U			P
Zinc			20	U	20	U	20	U			P

SW005 SW005DL

SW006 SW006DL SW007 SW007DL SW007P SW007PDL

none

SW003 SW003DL

ICB IDs:

CCB1 IDs: P= CCB951521

CCB2 IDs: P= CCB951533

CCB3 IDs: P= CCB951534

090311 1735

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Aluminum			11.3	J							P
Barium			10	U							P
Beryllium			3.65	U							P
Calcium			100	U							P
Iron			14.8	J							P
Magnesium			100	U							P
Manganese			10	U							P
Mercury											CV
Nickel			4.1	U							P
Potassium			500	U							P
Selenium			9	U							P
Sodium			300	U							P
Thallium			10	U							P
Vanadium			9	U							P
Zinc			20	U							P

10

ND

ND

SW003

SW003D

ICB IDs:

CCB1 IDs: P= CCB951546

CCB2 IDs:

CCB3 IDs:

090311 1735

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Run #2

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	100	U	91	J	11.5	J	10.9	J			P
Barium	10	U	10	U	10	U	10	U			P
Beryllium	3.65	U	0.186	J	0.154	J	3.65	U			P
Calcium	100	U	79.9	J	100	U	100	U			P
Iron	40	U	80.2	=	10.1	J	5.77	J			P
Magnesium	100	U	61.6	J	100	U	100	U			P
Manganese	-1.57	J	-1.04	J	-1.11	J	-2.09	J			P
Mercury											CV
Nickel	4.1	U	4.1	U	-1.04	J	4.1	U			P
Potassium	500	U	500	U	500	U	500	U			P
Selenium	9	U	4.37	J	9	U	9	U			P
Sodium	300	U	300	U	300	U	300	U			P
Thallium	10	U	10	U	10	U	10	U			P
Vanadium	9	U	9	U	9	U	9	U			P
Zinc	20	U	20	U	20	U	20	U			P

Na Only No Quals

ICB IDs: P= ICB952155

CCB1 IDs: P= CCB952160

CCB2 IDs: P= CCB952172

CCB3 IDs: P= CCB952184

090311 1735

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Preparation Blank Matrix (soil/water): WATER Method Blank ID: MB-57447

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

X1_110216B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.475	B	0.320	B	0.483	B	0.459	B	0.405	B	MS
Arsenic	0.226	B	0.190	U	0.190	U	0.190	U	0.500	U	MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U	0.200	U	MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U	1.000	U	MS
Cobalt	0.172	B	0.041	B	0.057	B	0.054	B	0.200	U	MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U	0.500	U	MS
Lead	0.170	B	0.068	U	0.068	U	0.068	U	0.200	U	MS
Silver	0.044	B	0.053	B	0.063	B	0.062	B	0.050	U	MS

NQ NQ NQ NQ

none assoc.

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110216B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 4	C	5	C	6	C	Preparation Blank	C	M
			1		2		3				
Antimony			0.356	B	0.443	B	0.235	B			MS
Arsenic			0.190	U	0.190	U	0.190	U			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Cobalt			0.079	B	0.081	B	0.071	B			MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.080	B	0.076	B	0.068	B			MS
Silver			0.088	B	0.087	B	0.076	B			MS

NQ

EB01-020311 SW003 1:50 all

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.306	B	0.255	B	0.438	B	0.200	U			MS
Arsenic	0.260	B	0.190	U	0.240	B	0.190	U			MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U			MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U			MS
Cobalt	0.059	B	0.024	U	0.047	B	0.024	B			MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U			MS
Lead	0.068	U	0.068	U	0.068	U	0.068	U			MS
Silver	0.022	U	0.029	B	0.049	B	0.023	B			MS

NQ

NQ

none assoc.

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0201

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.274	B NQ	0.190	U	0.207	B NQ			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Cobalt			0.042	B NQ	0.042	B NQ	0.033	B NQ			MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.109	B NQ	0.107	B NQ	0.094	B NQ			MS
Silver			0.044	B NQ	0.043	B NQ	0.026	B NQ			MS

SW004 1:500 all but Pb

SW005 1:500 As Co Cr Cu

SW006 1:500 SW007 SW007P ↓ all but Pb ↓

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0201

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 10	C	11	C	12	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.249	B	NQ						MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U							MS
Cobalt			0.061	B	NQ						MS
Copper			0.230	U							MS
Lead			0.090	B	NQ	0.068	U	0.071	B		MS
Silver			0.062	B	NQ	0.040	B	NQ 0.047	B	NQ	MS

SW006 1:500
7 1:500
7P 1:500

none

SW004 1:100 Pb

SW005 1:100 Sb Cd Pb Ag
SW006 Pb
7
7P

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0201

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U							MS
Cadmium			0.084	U							MS
Lead			0.083	B							MS
Silver			0.057	B							MS

13

NQ

NQ

see prev. page for assoc.

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Preparation Blank Matrix (soil/water): WATER Method Blank ID: MB-57447

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

X1_110216B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.475	B	0.320	B	0.483	B	0.459	B	0.405	B	MS
Arsenic	0.226	B	0.190	U	0.190	U	0.190	U	0.190	U	MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U	0.084	U	MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U	0.160	U	MS
Cobalt	0.172	B	0.041	B	0.057	B	0.054	B	0.024	U	MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U	0.230	U	MS
Lead	0.170	B	0.068	U	0.068	U	0.068	U	0.068	U	MS
Silver	0.044	B	0.053	B	0.063	B	0.062	B	0.022	U	MS

none assoc.

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110216B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 4	C	5	C	6	C	Preparation Blank	C	M
Antimony			0.356	B	0.443	B	0.235	B			MS
Arsenic			0.190	U	0.190	U	0.190	U			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Cobalt			0.079	B	0.081	B	0.071	B			MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.080	B	0.076	B	0.068	B			MS
Silver			0.088	B	0.087	B	0.076	B			MS

NQ NQ NQ NQ NQ NQ NQ NQ

EB02-020311 SW003 1:50

Sb Cd Pb Ag

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.306	B	0.255	B	0.438	B	0.200	U			MS
Arsenic	0.260	B	0.190	U	0.240	B	0.190	U			MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U			MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U			MS
Cobalt	0.059	B	0.024	U	0.047	B	0.024	B			MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U			MS
Lead	0.068	U	0.068	U	0.068	U	0.068	U			MS
Silver	0.022	U	0.029	B	0.049	B	0.023	B			MS

NQ

NQ

none assoc

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0201-D

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.274	B	0.190	U	0.207	B			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Cobalt			0.042	B	0.042	B	0.033	B			MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.109	B	0.107	B	0.094	B			MS
Silver			0.044	B	0.043	B	0.026	B			MS

SW003 1:500 As Co Cr Cu

SW004 1:500 SW005 all but Pb all but Pb & Sb

SW006 all but Pb Pb

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0201-D

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 10	C	2	C	3 12	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.249	B							MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U							MS
Cobalt			0.061	B							MS
Copper			0.230	U							MS
Lead			0.090	B	0.068	U	0.071	B			MS
Silver			0.062	B	0.040	B	0.047	B			MS

NQ NQ NQ NQ

SW006 all but Pb 7 7P

none

SW004 Pb

SW005 Sb Pb 6 7 7P

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0201-D

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 13 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U							MS
Cadmium			0.084	U							MS
Lead			0.083	B							MS
Silver			0.057	B							MS

NQ

see prev. page for assoc.

		YES	NO	N/A
	using MDLs from direct analysis(Preparation Method "NP1")? (Check Form III against the raw data)	[✓]	___	___

ACTION:
If no, inform CLP PO/TOPO and make a note in the Contract-Problems/Non-Compliance Section of the "Data Review Narrative".

A.1.14.2 Circle with red pencil on each Form III all Calib. Blank values that are:

≥ MDL but ≤ CRQL

> CRQL

A.1.14.2.1	When MDL < CRQL, is any Calib. Blank value ≥ MDL but ≤ CRQL?	✓	[___]	___

ACTION:
If yes, change sample results ≥ MDL but ≤ CRQL to the CRQL with a "U". Do not qualify non-detects.

A.1.14.2.2	When MDL < CRQL, is any Calib. Blank value > CRQL?	___	[✓]	___

ACTION:
If yes, reject (R) and red line the associated sample results > CRQL but <ICB/CCB Blank Result. Flag as "J" detects > ICB/CCB blank value but < 10xICB/CCB value. Change the sample results ≥ MDL but ≤ the CRQL to CRQL with a "U".

A.1.14.2.3	Is any Calibration Blank value below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated all associated sample results ≥ CRQL but <10xCRQL.

NOTE:

1. For ICB that does not meet the technical QC Criteria, apply the action to all samples

	YES	NO	N/A

reported from the analytical run.
2. For CCBs that do not meet the technical QC criteria, apply the action to all samples analyzed between a previous technically acceptable analysis of CCB and a subsequent technically acceptable analysis of the CCB in the analytical run.,

A.1.15 **Preparation Blank - FORM III**

NOTE: The Preparation Blank for mercury is the same as the calibration blank.

A.1.15.1 Was one Preparation Blank prepared with and analyzed for:

Each Sample Delivery Group (SDG)?	[✓]	___	___
Each batch of the SDG samples digested/distilled?	[✓]	___	___
Each matrix type?	[✓]	___	___
All instruments used for metals and cyanide analyses?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the associated positive data <10xMDL for which the Preparation Blank was not analyzed.

NOTE:
If only one blank was analyzed for more than 20 samples, then the first 20 samples analyzed are not estimated(J),but all additional samples must be qualified (J).

A.1.15.2 Circle with red pencil on each Form III all Prep. Blank values that are:

≥ MDL but ≤ CRQL, and

> CRQL

A.1.15.2.1 When MDL < CRQL, is any preparation blank value ≥ MDL but ≤ CRQL?	✓	[___]	___

ACTION:
If yes, change sample result ≥ MDL

		YES	NO	N/A
	but ≤ CRQL to CRQL with a "U".			
A.1.15.2.2	When the MDL ≤ CRQL, is any Preparation Blank value greater than its CRQL?	___	[✓]	___
	If yes, is the Prep. Blank value greater than the value of the associated Field Blank collected and analyzed with the SDG samples?	___	[___]	✓
	If yes, is the lowest concentration of that analyte in the associated samples less than 10 times the Preparation Blank value?	___	[___]	✓
	ACTION: If yes, reject (R) and red-line all associated sample results greater than the CRQL but less than the Prep.Blank value. Flag as "J" detects > Prep. Blank value but <10xPrep.Blank. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.			
	If the Prep. Blank value is less than the same analyte value in the Field Blank, do not qualify the sample results due to the Prep. Blank criteria.			
	NOTE: Convert soil sample result to mg/Kg on wet weight basis to compare with the soil Prep. Blank result on Form III.			
A.1.15.2.3	Is the Prep. Blank concentration below the negative CRQL?	___	[✓]	___
	ACTION: If yes, flag (J) all associated sample results less than 10xCRQL. Qualify non-detects as estimated (UJ).			
A.1.15.2.4	When the MDL is greater than the CRQL, is the preparation blank concentration on Form III greater than two times the MDL?	___	[___]	✓
	ACTION:			

		YES	NO	N/A
	If yes, reject (R) and red-line all positive sample results with sample raw data less than 10 times the Preparation Blank value.			
A.1.16	**ICP-AES/ICP-MS Interference Check Sample (ICS) - Form IV** **NOTE:** Not required for CN, Hg, Al, Ca, Fe and Mg.			
A.1.16.1	Present and complete?	[✓]	___	___
	Was ICS analyzed at the beginning and end of each analytical run, and once for every 20 analytical samples?	[___]	___	✓
	Was ICS analyzed at the beginning of the ICP-MS analytical run?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all sample results.			

ICS standards analyzed at beginning of runs only.

A.1.16.2	**ICP-AES Method**			
A.1.16.2.1	**ICSA Solution:** For ICP-AES, are the ICSA "Found" analyte values within the control limits ± of CRQL of the true/established mean value?	[✓]	___	___
	If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSA Solution on Form IV?	[___]	___	✓
	ACTION: If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run: Flag (J) as estimated only sample results ≥MDL			

		YES	NO	N/A
	for which the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag non-detects as "UJ" and detects as "J".			
A.1.16.2.3	**ICSAB Solution** For ICP-AES, are all analyte results in ICSAB within the control limits of 80-120 of the true/established mean value?	[✓]	___	___
	If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSAB Solution on Form IV?	[___]	___	✓
	ACTION: If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run:			
	Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79%, qualify sample results ≥ MDL as "J" and non-detects as "UJ". Reject (R) and red-line all sample results (detects & non-detects) for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only positive results.			
A.1.16.3	**ICP-MS Method**			
A.1.16.3.1	**ICSA Solution:** For ICP-MS, are the ICSA "Found" analyte values within the control limits of ±CRQL of the true/established mean value?	[✓]	___	___
	ACTION: If no, apply the following action to all samples reported from the analytical run:			
	Flag (J) as estimated only sample results ≥ MDL if the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag the associated sample detects as "J" and non-detects as "UJ".			

		YES	NO	N/A
A.1.16.3.3	**ICSAB Solution** For ICP-MS, are all analyte results in ICSAB within the control limits of 80-120% of the true/established mean value, whichever is greater?	[___]	___	✓

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79% flag (J) as estimated the associated sample results ≥ MDL. Reject (R) and red-line those all sample detects and non-detects for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%,reject (R) and red-line only detects (≥ MDL).

A.1.17 **Spiked Sample Recovery: Pre-Digestion/Pre-Distillation)-Form V A**
Note:Not required for Ca,Mg,K,and Na(both matrices);Al and Fe (soil only)

A.1.17.1	Was Matrix Spike analysis performed:			
	For each matrix type?	[✓]	___	___
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each concentration range (i.e.,low, med., high)?	[✓]	___	___
	For each analytical Method (ICP-AES,ICP-MS, Hg, CN)used?	[✓]	___	___
	Was a spiked sample prepared and analyzed with the SDG samples?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated(J)all the positive data for which a spiked sample was not analyzed.

NOTE:
If more than one spiked sample were analyzed for one SDG, then qualify the associated data based on the worst spiked sample analysis.

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.: VWW06-SW004-0211S

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201

Matrix (soil/water): WATER Level (low/med): MED

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75-125	50000	U	100	U	100	0	N	MS
Arsenic	75-125	47500	U	95.0	U	40.0	0	N	MS
Cadmium	75-125	49.1	B	42.0	U	50.0	98		MS
Chromium	75-125	291	B	80.0	U	200	146	N	MS
Cobalt	75-125	477	B	12.0	U	500	95		MS
Copper	75-125	192	B	120	U	250	77		MS
Lead	75-125	29.3	B	9.3	B	20.0	100		MS
Silver	75-125	48.5	B	11.0	U	50.0	97		MS

NQ 1:500

NQ 1:500

Comments:

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

VWW06-SW004-0211S

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0201-D

Matrix (soil/water): WATER Level (low/med): MED

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75-125	50000	U	100	U	100	0	N	MS
Arsenic	75-125	47500	U	102	B	40.0	-255	N	MS
Cadmium	75-125	52.5	B	42.0	U	50.0	105		MS
Chromium	75-125	272	B	80.0	U	200	136	N	MS
Cobalt	75-125	505		12.0	U	500	101		MS
Copper	75-125	197	B	120	U	250	79		MS
Lead	75-125	22.1	B	6.8	U	20.0	111		MS
Silver	75-125	46.3	B	11.0	U	50.0	93		MS

NQ 1:500 ↓ ↓

NO 1:500

Comments:

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.

350197702ADL1

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501977

Matrix: Water Level:(low/med) LOW

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Sodium	80 - 120	22500000.00		15896167.86		5000000	131.5		P

Note - No Quals

Comments:

090311 1734

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.

350197702A

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.

Lab Code: PEL Case No.: _____ SAS No: _____ SDG No.: 3501977

Matrix: Water Level:(low/med) LOW

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	1010000.00		875.40	J	1000000	101.1		P
Barium	80 - 120	32200.00		16.11	J	30000	107.4		P
Beryllium	80 - 120	11400.00		1.57	U	10000	114.5		P
Calcium	80 - 120	1550000.00		523216.58		1000000	103.1		P
Iron	80 - 120	999000.00		813.48		1000000	99.9		P
Magnesium	80 - 120	2520000.00		1357701.73		1000000	116.0		P
Manganese	80 - 120	11000.00		-44.32	U	10000	109.7		P
Mercury	80 - 120	2.01		0.01	U	3	67.1		CV
Nickel	80 - 120	10700.00		-8.20	U	10000	107.4		P
Potassium	80 - 120	1690000.00		544557.68		1000000	114.2		P
Selenium	80 - 120	11800.00		-162.55	U	10000	118.5		P
Thallium	80 - 120	10200.00		31.74	U	10000	101.6		P
Vanadium	80 - 120	11100.00		4.52	U	10000	111.2		P
Zinc	80 - 120	11000.00		-11.80	U	10000	109.8		P

Note

Comments:

090311 1734

		YES	NO	N/A
A.1.17.2	Was a field blank or PE sample used for the spiked sample analysis?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated positive data of the associated SDG samples for which field blank or PE sample was used for the spiked sample analysis.

A.1.17.3	Circle on each Form VA all spike recoveries that are outside the control limits (75-125%) that have sample concentrations less than four times the added spike concentrations.			
	Are all recoveries within the control limits when sample concentrations are less than or equal to four times the spike concentrations?	[___]	___	___

NOTE:
Disregard the out of control spike recoveries for analytes whose concentrations are greater than or equal to four times the spike added.

	Are results outside the control limits (75-125%) flagged with Lab Qualifier "N" on Form I's and Form VA?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract - Problems/Non-Compliance Section of the Data Review Narrative.

A.1.17.4 **Aqueous**

*K, Mg, Ca & Na diluted out OR due to a native conc. NA

Are any spike recoveries:			
(a) less than 30%?	*✓	[___]	___
(b) between 30-74%?	✓	[___]	___
(c) between 126-150%?	✓	[___]	___
(d) greater than 150%?	*✓	[___]	___

ACTION:
If the matrix spike recovery is less than 30%, reject (R) and red-line all associated aqueous data (detects & non-detects). If between 30-74%, qualify all associated aqueous data ≥ MDL as "J" and non-detects

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Tuesday, April 19, 2011 3:47 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: Vieques SWMU 6 - Metals Issue SDG 3501977
Attachments: 6010.pdf; 6010D CN.pdf; 6010D.pdf; 6010 CN.pdf

Good afternoon.

Attached are the revised Form 5A and case narratives for 6010 and 6010_Dissolved for 3501977.

I will have this revision posted online later today.

Please contact me with any questions or concerns.

Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Sunday, April 17, 2011 12:55 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: Vieques SWMU 6 - Metals Issue SDG 3501977
Importance: High

Dear John,

Good Morning! I have an issue regarding the metals data in SDG 3501977. The submitted Form 5A and the case narrative refer to 0% recoveries for the MS/SD of sample VWW06-SW004-0211. However when I calculate recoveries for these analytes I am not getting 0% recoveries. For example: p. 533 in the data package – for Mn spiked sample result us 553, sample result is U and spike amount is 500. The %R calculation gives (553/500) * 100 = 111%. 2nd Example: p. 534 - for Fe spiked sample result is 75400, sample result is 813, and spiked amount is 50000. The %R calculation gives ((75400-813)/50000)*100 = 149%. The same situation is presented on the Form 5As for the dissolved metals fraction (pp. 601 & 603). Please clarify the results reported on these Form 5As. It is possible that I am missing something in the interpretation of the results that your analysts can clear up. If necessary, please resubmit these forms with corrected recoveries and revise the case narrative to reflect the changes. Please contact me if you have any questions regarding this issue! Thank you.

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M	
Aluminum	80 - 120	64000		875	J	50000	126.3	N	P	J+
Barium	80 - 120	1760		16.1	J	1500	116.3		P	
Beryllium	80 - 120	608		4.80	U	500	120.6	N	P	J+ - No + NQ
Calcium	-	617000		523000		50000	0 D	N	P	NA
Iron	80 - 120	65400		813		50000	129.2	N	P	J+
Magnesium	-	1560000		1360000		50000	400	N	P	NA
Manganese	80 - 120	553		14.0	U	500	107.8		P	
Mercury	80 - 120	1.86		0.0740	U	3.00	62	N	CV	J/UJ
Nickel	80 - 120	556		37.2	U	500	103.8		P	
Potassium	-	646000		544000		50000	204	N	P	NA
Selenium	80 - 120	531		164	U	500	73.4	N	P	J/UJ
Sodium	-								NR	
Thallium	80 - 120	563		176	U	500	77.4	N	P	NQ MSOOK
Vanadium	80 - 120	584		17.6	U	500	113.3		P	
Zinc	80 - 120	574		160	U	500	82.8		P	

Revised Reviewed Via email JLC 4/9/11

Comments:

190411 1641

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M	
Aluminum	80 - 120	74700		875	J	50000	147.7	N	P	J+
Barium	80 - 120	1900		16.1	J	1500	125.6	N	P	NQ-MS OK
Beryllium	80 - 120	664		4.80	U	500	131.8	N	P	J+ ~ Not NQ
Calcium	-	701000		523000		50000	0 D	N	P	NA
Iron	80 - 120	75400		813		50000	149.2	N	P	J+
Magnesium	-	1760000		1360000		50000	800	N	P	NA
Manganese	80 - 120	599		14.0	U	500	117		P	
Mercury	80 - 120	1.94		0.0740	U	3.00	64.7	N	CV	J/UJ
Nickel	80 - 120	596		37.2	U	500	111.8		P	
Potassium	-	738000		544000		50000	388	N	P	NA J/UJ
Selenium	80 - 120	543		164	U	500	75.8	N	P	
Sodium	-								NR	
Thallium	80 - 120	610		176	U	500	86.8		P	
Vanadium	80 - 120	632		17.6	U	500	122.9	N	P	NQ MS OK
Zinc	80 - 120	632		160	U	500	94.4		P	

JC 4/19/11
Jate Received via email

Comments:

190411 1641

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211SDDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	-								NR
Barium	-								NR
Beryllium	-								NR
Calcium	-								NR
Iron	-								NR
Magnesium	-								NR
Manganese	-								NR
Mercury	-								NR
Nickel	-								NR
Potassium	-								NR
Selenium	-								NR
Sodium	-	12500000		15900000		50000	0 D	N	P
Thallium	-								NR
Vanadium	-								NR
Zinc	-								NR

NQ - high level DL

Revised Received via Email 4/19/11

Comments:

190411 1641

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211MSDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	-								NR
Barium	-								NR
Beryllium	-								NR
Calcium	-								NR
Iron	-								NR
Magnesium	-								NR
Manganese	-								NR
Mercury	-								NR
Nickel	-								NR
Potassium	-								NR
Selenium	-								NR
Sodium	-	11000000		15900000		50000	0 D	N	P
Thallium	-								NR
Vanadium	-								NR
Zinc	-								NR

NO high level DL

MC 4/19/11 Revised Received via email

Comments:

190411 1641

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75 - 125	61300		1740	J	50000	119.1		P
Barium	75 - 125	1800		19.6	J	1500	118.7		P
Beryllium	75 - 125	625		2.97	J	500	124.4		P
Calcium	-	561000		419000		50000	284	N	P
Iron	75 - 125	61900		293	J	50000	123.2		P
Magnesium	-	1650000		1280000		50000	740	N	P
Manganese	75 - 125	558		14.0	U	500	108.8		P
Mercury	80 - 120	2.02		0.0439	J	3.00	67.3	N	CV
Nickel	75 - 125	590		37.2	U	500	110.6		P
Potassium	-	572000		436000		50000	272	N	P
Selenium	75 - 125	560		164	U	500	79.2		P
Sodium	-								NR
Thallium	75 - 125	617		176	U	500	88.2		P
Vanadium	75 - 125	616		17.6	U	500	119.7		P
Zinc	75 - 125	642		160	U	500	96.4		P

NA
NA
J UJ
NA

Revised
Received via e-mail
4/19/11 gc

Comments:

190411 1641

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75 - 125	57800		1740	J	50000	112.1		P
Barium	75 - 125	1670		19.6	J	1500	110		P
Beryllium	75 - 125	576		2.97	J	500	114.6		P
Calcium	-	528000		419000		50000	218	N	P
Iron	75 - 125	57800		293	J	50000	115		P
Magnesium	-	1510000		1280000		50000	460	N	P
Manganese	75 - 125	520		14.0	U	500	101.2		P
Mercury	80 - 120	2.06		0.0439	J	3.00	68.6	N	CV
Nickel	75 - 125	529		37.2	U	500	98.4		P
Potassium	-	536000		436000		50000	200	N	P
Selenium	75 - 125	490		164	U	500	65.2	N	P
Sodium	-								NR
Thallium	75 - 125	561		176	U	500	77		P
Vanadium	75 - 125	554		17.6	U	500	107.3		P
Zinc	75 - 125	528		160	U	500	73.6	N	P

NA

NA

J7UJ

NA

NA MS OK

NA MS OK

Revised Received Via email 4/9/11

Comments:

190411 1641

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211MSDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	-								NR
Barium	-								NR
Beryllium	-								NR
Calcium	-								NR
Iron	-								NR
Magnesium	-								NR
Manganese	-								NR
Mercury	-								NR
Nickel	-								NR
Potassium	-								NR
Selenium	-								NR
Sodium	-	10700000		10800000		50000	0 D	N	P
Thallium	-								NR
Vanadium	-								NR
Zinc	-								NR

NQ high level DL required

Revised Received via e-mail JAC 4/9/11

Comments:

_____

_____

_____

_____

100411 1641

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211SDDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	-								NR
Barium	-								NR
Beryllium	-								NR
Calcium	-								NR
Iron	-								NR
Magnesium	-								NR
Manganese	-								NR
Mercury	-								NR
Nickel	-								NR
Potassium	-								NR
Selenium	-								NR
Sodium	-	14200000		10800000		50000	0 D	N	P
Thallium	-								NR
Vanadium	-								NR
Zinc	-								NR

NC
Revised
Received via email
11/9/11

Comments:

190411 1641

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.

350197702ADL1

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501977

Matrix: Water Level:(low/med) LOW

Dissolved

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Sodium	80 - 120	18200000.00		10768490.84		5000000	148.2		P

Note NQ

Comments:

090311 1735

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.

350197702A

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501977

Matrix: Water Level:(low/med) LOW

Dissolved

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	1050000.00		1743.73	J	1000000	104.7		P
Barium	80 - 120	33300.00		19.59	J	30000	111.0		P
Beryllium	80 - 120	11900.00		2.97	J	10000	119.1		P
Calcium	80 - 120	1520000.00		419008.72		1000000	109.7		P
Iron	80 - 120	1040000.00		293.29	J	1000000	103.5		P
Magnesium	80 - 120	2510000.00		1280164.59		1000000	123.2		P
Manganese	80 - 120	11300.00		-45.53	U	10000	113.5		P
Mercury	80 - 120	1.94		0.04	J	3	63.4		CV
Nickel	80 - 120	11100.00		-16.34	U	10000	110.6		P
Potassium	80 - 120	1610000.00		436298.32		1000000	117.0		P
Selenium	80 - 120	12500.00		-90.84	U	10000	125.3		P
Sodium	80 - 120			10888378.87		1000000			P
Thallium	80 - 120	10500.00		66.27	U	10000	104.9		P
Vanadium	80 - 120	11500.00		6.51	U	10000	115.2		P
Zinc	80 - 120	11300.00		1.57	U	10000	112.9		P

Note

Comments:

090311 1735

		YES	NO	N/A
	as "UJ". If between 126-150%, flag (J) all data ≥ MDL as "J". If greater than 150%, reject (R) and red-line all associated data ≥ MDL.			
	(NOTE:Replace "N" with "J", "R" as appropriate.)			
A.1.17.5	**Soil/Sediment**			
	Are any spike recoveries:			
	(a) less than 10%?	___	[___]	✓
	(b) between 10-74%?	___	[___]	✓
	(c) between 126-200%?	___	[___]	✓
	(d) greater than 200%?	___	[___]	✓
	ACTION: If yes for any of the above, proceed as follows:			
	If the matrix spike recovery is less than 10%, reject (R) and red-line all associated data (detects & non-detects); if between 10-74%, qualify all associated data ≥ MDL as "J" and non-detects as "UJ"; if between 126-200%, flag (J) all associated data ≥ MDL as "J" If greater than 200%, reject (R) and red-line all associated data ≥ MDL. (NOTE:Replace "N" with "J" or "R" as appropriate.)			
A.1.18	**Lab Duplicates) - Form VI**			
A.1.18.1	Was the lab duplicate analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each matrix type?	[✓]	___	___
	For each concentration range (low or med.)?	[✓]	___	___
	For each analytical Method (ICP-AES/ICP-MS, Hg, CN) Used?	[✓]	___	___
	Was a lab duplicate prepared and analyzed with the SDG samples?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no for any of the above, flag (J) as estimated all the SDG sample results (detects & non-detects) for which the lab duplicate analysis was not performed.			
	NOTE: If more than one lab duplicate sample were analyzed for an SDG, then qualify the associated samples based on the worst lab duplicate analysis.			
A.1.18.2	Was a Field Blank or PE sample used for the Lab Duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) all SDG sample results (hits & non-detects) for which Field Blank or PE sample was used for duplicate analysis.			
A.1.18.3	Circle on each Form VI all values that are: RPD > 20%, or Absolute Difference > CRQL			
	Are all values within control limits (RPD ≤ 20% or absolute difference ≤ ±CRQL)?	[___]	✓	___
	If no, are all results outside the control limits flagged with an "*" (Lab Qualifier) on Form VI and on all Form I's?	[✓]	___	___
	ACTION: If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.			
	NOTE: The laboratory is not required to report on Form VI the RPD when both values are non-detects.			
A.1.18.4	**Aqueous**			
A.1.18.4.1	When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			

U.S. EPA - CLP

6

DUPLICATES

EPA Sample No.

VWW06-SW004-0211SDDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0 % Solids for Duplicate: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Sodium	20	10700000		14200000		28.1	*	P

JTWJ

lab SOP/client SAP QC limits used

Comments:

090311 1735

	YES	NO	N/A
is any RPD > 20% but < 100%?	✓	[ ]	
is any RPD ≥ 100%?		[ ]	

ACTION:
If the RPD is > 20% but < 100%, flag (J) as estimated the associated sample data ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line the associated sample data ≥ CRQL.

(NOTE:Replace "*" with "J" or "R" as appropriate.)

A.1.18.4.2 When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate values:

> ± CRQL?		[ ]	✓
> ± 2xCRQL?		[ ]	✓

ACTION:
If the absolute difference is > CRQL, flag as estimated all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 2xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but < 5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.18.5 **Soil/Sediment**

A.1.18.5.1 When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%?		[ ]	✓
is any RPD ≥ 120%?		[ ]	✓

ACTION:
If the RPD is ≥ 35% and < 120%, flag (J) as estimated the associated sample

		YES	NO	N/A
	data ≥ CRQL. If the RPD is ≥ 120%, reject (R)and red-line the associated sample data ≥ CRQL.			
A.1.18.5.2	When the sample and/or duplicate value <5xCRQL(substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and duplicate:			
	> ± 2 x CRQL?	___	[___]	✓
	> ± 4 x CRQL	___	[___]	✓

ACTION:
If the absolute difference is > 2 x CRQL, flag all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 4xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but <5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.19 Field Duplicates

Aqueous Field Duplicates

A.1.19.1	Was an aqueous Field Duplicate pair collected and analyzed? (Check Sampling Trip Report)	[__U✓]	___	___

ACTION:
If yes, prepare a Form (Appendix A.4) for each aqueous Field Duplicate pair. Report the sample and Field Duplicate results on Appendix A.4 from their respective Form I's. Calculate and report RPD on Appendix A.4 when sample and its Field Duplicate values are both > 5xCRQL. Calculate and report the absolute difference on Appendix A.4 when at least one value (sample or duplicate) is <5xCRQL. Evaluate the aqueous Field Duplicate analysis in accordance with the

	YES	NO	N/A

QC criteria stated in Sections A.1.19.2 and A.1.19.3.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this the criteria to qualify the results.

A.1.19.2 Circle all values on the Form (Appendix A.4) for Field Duplicates that have:

RPD ≥ 20% or

Difference > ± ~~CRQL~~ LOD

When sample and duplicate values are both ≥5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 20%?	___	[___]	✓
is any RPD ≥ 100%?	___	[___]	✓

ACTION:
If the RPD is >20% but < 100%, flag (J) only the associated sample and its Field Duplicate results ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line only the associated sample and its Field Duplicate result ≥ CRQL.

A.1.19.3 When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate:

> ± ~~CRQL~~? LOD	___ ✓	[___]	✓
> ± 2 x ~~CRQL~~? LOD	___	[___]	✓

xlcorr JAC

Reject Al in SW007/007P dissolved
Abs. dif > 2X LOD

ACTION:
If the absolute difference is > CRQL, flag detects ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the difference is > 2xCRQL, reject (R) and red-line non-detects

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SW007-0211
Duplicate Sample ID: VWW06-SW007P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
aluminum			0
barium	5.74	5.42	0.32
cadmium			0
calcium	462000	464000	0
cobalt			#DIV/0!
copper			#DIV/0!
iron			0
lead			#DIV/0!
magnesium	1260000	1160000	8
manganese			#DIV/0!
mercury			0
nickel			#DIV/0!
potassium	476000	480000	1
sodium	10600000	10800000	2
thallium			0
vanadium			0
zinc			#DIV/0!
arsenic			0
copper			0
selenium			#DIV/0!

COMMENTS: 20% RPD limit for all analytes >5X LOD; +/- 1X LOD if <5X LOD - J flag
100% RPD limit or +/- 2X LOD limit for R flag.

DataQual **Dissolved Metals**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SW007-0211
Duplicate Sample ID: VWW06-SW007P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
aluminum	1230	372	858
barium	6.48	5.92	0.56
cadmium			0
calcium	409000	465000	13
cobalt			#DIV/0!
copper			#DIV/0!
iron			#DIV/0!
lead			#DIV/0!
magnesium	1290000	1200000	7
manganese			#DIV/0!
mercury			#DIV/0!
nickel			#DIV/0!
potassium	428000	470000	9
sodium	10900000	10700000	2
selenium			0
vanadium			0
zinc			#DIV/0!
arsenic			0
copper			0
lead			0

Reject in both

COMMENTS: 20% RPD limit for all analytes >5X LOD; +/- 1X LOD if <5X LOD - J flag
100% RPD limit or +/- 2X LOD limit for R flag.

		YES	NO	N/A
	and results ≥ MDL but <5xCRQL of the sample and its Field Duplicate.			
	Soil/Sediment Field Duplicates			
A.1.19.4	Was a soil field duplicate pair collected and analyzed? (Check Sampling Trip Report)	[___]	___	✓
	ACTION: If yes, for each soil Field Duplicate pair proceed as follows:			
	Prepare Appendix A.4 for each Field Duplicate pair. Report on Appendix A.4 all sample and its Field Duplicate results in MG/KG from their respective Form I's. Calculate and report RPD when sample and its duplicate values are both greater than 5xCRQL. Calculate and report the absolute difference when at least one value (sample or duplicate) is < 5xCRQL. Evaluate the Field Duplicate analysis in accordance with the QC Criteria stated in Sections A.1.19.5 and A.1.19.6.			
	NOTE: 1. Do not transfer "*" from Form I's to Appendix A.4. 2. Do not calculate RPD when both values are non-detects. 3. Substitute MDL for CRQL when MDL > CRQL. 4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and apply the criteria to qualify the results.			
A.1.19.5	Circle on each Appendix A.4 all values that have: RPD ≥ 35%, or Difference > ± 2xCRQL When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			
	is any RPD ≥ 35% but < 120%?	___	[___]	✓
	is any RPD ≥ 120%?	___	[___]	✓
	ACTION: If the RPD is ≥ 35% but < 120%,			

		YES	NO	N/A
	flag only the associated sample and its Field Duplicate results ≥ CRQL as "J". If the RPD is ≥ 120%, reject (R) and red-line only the sample and its Field Duplicate results ≥ CRQL.			
A.1.19.6	When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and Field Duplicate:			
	> ± 2 x CRQL?	___	[___]	✓
	> ± 4 x CRQL?	___	[___]	✓
	ACTION: If the absolute difference is > 2xCRQL, flag Sample and its Field Duplicate resuts ≥ MDL but <5xCRQL as "J" and non-detects as "UJ". If the difference is >4xCRQL, reject(R) and red-line non-detects and detects ≥ MDL but <5xCRQL of the sample and its Field Duplicate.			
A.1.20	**Laboratory Control Sample (LCS) - Form VII**			
A.1.20.1	Was one LCS prepared and analyzed for:			
	Each SDG?	[✓]	___	___
	Each matrix type?	[✓]	___	___
	Each batch samples digested/distilled?	[✓]	___	___
	For each Method(ICP-AES,ICP-MS,Hg,CN) used?	[✓]	___	___
	Was an LCS prepared and analyzed with the samples?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log and contact CLP PO or TOPO for submittal of the LCS results. Flag (J) as estimated all the data for which an LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for			

	YES	NO	N/A

more than 20 samples, then the first 20 samples analyzed are not flagged(J), but all additional samples must be qualified (J).

A.1.20.2 Aqueous LCS

Circle on each Form VII the LCS percent recoveries outside control limits 80-120%.

NOTE: 1.Use digested ICV as LCS for aqueous mercury
2.Use distilled ICV as LCS for aqueous cyanide

Is any LCS recovery:

Less than 50%?	___	[✓]	___
Between 50% and 79%?	___	[✓]	___
Between 121% and 150%?	___	[✓]	___
Greater than 150%?	___	[✓]	___

ACTION:
If the LCS recovery is less than 50%, reject (R) and red-line all associated sample data (detects & non-detects); for a recovery between 50-79%, flag detects as "J" all non-detects as "UJ". if the LCS recovery is between 121-150%, flag only detects as "J". if the recovery is greater than 150%, reject (R) and red-line all detects.

A.1.20.3 Solid LCS

If an analyte's MDL is equal to or greater than the true value of LCS, disregard the "Action" below for that analyte even though the LCS is out of control limits.

Is the LCS "Found" value greater than the Upper Control Limit reported on Form VII?	___	[___]	✓

ACTION:

		YES	NO	N/A
	If yes, flag (J) all the associated detects ≥ MDL as estimated (J).			
	Is the LCS "Found" value lower than the Lower Control Limit reported on Form VII?	___	[___]	✓ ___
	ACTION: If yes, flag detects as "J" and non-dectes as "UJ".			
A.1.21	**ICP-AES/ICP-MS Serial Dilution - Form VIII** **NOTE:** Serial dilution analysis is required only when the initial concentration is equal to or greater than 50 x MDL.			
A.1.21.1	Was a Serial Dilution analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each matrix type?	[✓]	___	___
	For each concentration range (low or med.)?	[✓]	___	___
	Was a Serial Dilution sample analyzed with the SDG samples?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) detects ≥ MDL of all the SDG samples for which the ICP Serial Dilution Analysis was not performed.			
A.1.21.2	Was a Field Blank or PE sample used for the Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) detects ≥ MDL of all the SDG samples			
A.1.21.3	Circle on Form VIII the Percent Differences (%D) between sample results and its dilution results that are outside the control limits ± 10%			

U.S. EPA - CLP

9

SERIAL DILUTIONS

EPA Sample No.

350197702L

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501977

Matrix: Water Level:(low/med) LOW

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M
Aluminum	875.40	J	2570.00	J	190	E	P
Barium	16.11	J	44.00	U			P
Beryllium	1.57	U	24.00	U			P
Calcium	523216.58		581000.00		11	E	P
Iron	813.48		1100.00	U			P
Magnesium	1357701.73		560000.00		59	E	P
Manganese	-44.32	U	70.00	U			P
Mercury	0.01	U	0.37	U			CV
Nickel	-8.20	U	186.00	U			P
Potassium	544557.68		574000.00		5.4		P
Selenium	-162.55	U	820.00	U			P
Thallium	31.74	U	880.00	U			P
Vanadium	4.52	U	88.00	U			P
Zinc	-11.80	U	800.00	U			P

R

JWJ

JWJ

Comments:

090311 1734

		YES	NO	N/A
	when initial concentrations ≥ 50 x MDLs.			
	Are results outside the control limits flagged with an "E"(Lab Qualifier) on Form VIII and all Form I's?	✓	[ ]	
	ACTION: If no, write in the Contract-Problem/ Non-Compliance Section of the Data Review Narrative.			
A.1.21.4	Are any %D values:			
	> 10%?	✓	[ ]	
	≥ 100%?	✓	[ ]	
	ACTION: If the Percent Difference (%D) is greater than 10%, flag (J) as estimated all associated samples whose raw data ≥ MDL; if the %D is ≥ 100%, reject (R) and red-line all associated samples with raw data ≥ MDL.			
	(NOTE:Replace "E" with "J" or "R" as appropriate.)			
A.1.22	**Total/Dissolved or Inorganic/Total Analytes**			
A.1.22.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s)?	✓	[ ]	
	Were any analyses performed for inorganic as well as total analytes on the same sample(s)?		[ ]	✓
	ACTION: If yes, prepare a Form (Appendix A.5) to compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference on Appendix A.5 as a percent of the total analyte only when both of the following conditions are fulfilled:			
	(1) The dissolved(or inorganic)concentration is greater than total concentration, and (2) greater than or equal to 5xMDL.			
A.1.22.2	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%?		[✓]	

Total & Dissolved Analyte Concentrations

Per Region II validation SOP:

Note: Comparison between total and dissolved results is made only when both of the following conditions is met:

1. the dissolved concentration is greater than the total concentration, AND
2. the dissolved concentration is greater than or equal to 5X the LOD.

If %Difference is greater than 20% but less than 50% results are J, if >50% results are R.

Sample ID: VWW06-SW003-0211 Duplicate Sample ID: VWW06-SW003-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium			#DIV/0!
magnesium	1310000	1320000	1
sodium			#DIV/0!
potassium	433000	438000	1
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: VWW06-SW007-0211 Duplicate Sample ID: VWW06-SW007-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium			#DIV/0!
magnesium	1260000	1290000	2
sodium	10600000	10900000	3
potassium			#DIV/0!
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: VWW06-SW007P-0211 Duplicate Sample ID: VWW06-SW007P-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium	464000	465000	0
magnesium	1160000	1200000	3
sodium			#DIV/0!
potassium			#DIV/0!
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: Duplicate Sample ID:

Analyte	Total Conc.	Dissolved Conc.	%D
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: Duplicate Sample ID:

Analyte	Total Conc.	Dissolved Conc.	%D
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

Action: No action required - %D criteria were met.

		YES	NO	N/A
A.1.22.3	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 50%?	___	[___]	✓

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) and red-line both the values.

A.1.23 **Field Blank - Form I**
NOTE: Designate "Field Blank" as such on Form I

A.1.23.1	Was a Field/Rinsate Bank collected and analyzed with the SDG samples?	[✓]	___	___
	If yes, is any Field/Rinsate Blank absolute value of an analyte on Form I greater than its CRQL (or 2xMDL when MDL>CRQL)?	___	[✓]	___
	If yes, circle the Field Blank value on Form I that is greater than the CRQL, (or 2 x MDL when MDL > CRQL).			
	Is any Field Blank value greater than CRQL also greater than the Preparation Blank value?	___	[✓]	___
	If yes, is the Field Blank value (> CRQL and > the prep. blank value) already rejected due to other QC criteria?	[___]	___	✓

ACTION:
If the Field Blank value was not rejected, reject all associated sample data (except the Field Blank results) greater than the CRQL but less than the Field Blank value. Reject on Form I's the soil sample results whose raw values in ug/L in the instrument printout are greater than the CRQL but less than the Field Blank value in ug/L. Flag as "J" detects between the Field Blank value and 10xField Blank value. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

If the Field Blank value is less than the

		YES	NO	N/A
	Prep.Blank value, do not qualify the sample results due to the Field Blank criteria.			

NOTE:
1. Field Blank result previously rejected due to other criteria cannot be used to qualify field samples.
2. Do not use Rinsate Blank associated with soils to qualify water samples and vice versa.

A.1.24 Verification of Instrumental Parameters - Form IX, XA, XB, XI

A.1.24.1	Is verification report present for:			
	Method Detection Limits (Form IX-Annually)?	[✓]	___	___
	ICP-AES Interelement Correction Factors (Form XA & XB -Quarterly)?	[✓]	___	___
	ICP-AES & ICP-MS Linear Ranges (Form XI-Quarterly)?	[✓]	___	___

ACTION:
If no, contact CLP PO/TOPO for submittal from the laboratory.

A.1.24.2 Method Detection Limits - Form IX

A.1.24.2.1	Are MDLs present on Form IX for:			
	All the analytes?	[✓]	___	___
	All the instruments used?	[✓]	___	___
	Digested and undigested samples and Calib.Blanks?	[___]	___	✓
	ICP-AES and ICP-MS when both instruments are used for the same analyte?	[___]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO/TOPO for submittal of the MDLs from the laboratory. Report to CLP PO and write in the Contract Problems/ Non-Compliance Section of the Data Review Narrative if the MDL concentration is not less than ½ CRQL.

		YES	NO	N/A
A.1.24.2.2	Is MDL greater than the CRQL for any analyte?	___	[✓]	___
	If yes, is the analyte concentration on Form I greater than 5 x MDL for the sample analyzed on the instrument whose MDL exceeds CRQL?	[___]	___	✓
	ACTION: If no, flag as estimated (J) all values less than five times MDL for the analyte whose MDL exceeds the CRQL.			
A.1.24.3	**Linear Ranges - Form XI**			
A.1.24.3.1	Was any sample result higher than the high linear range for ICP-AES or ICP-MS?	✓	[___]	___
	Was any sample result higher than the highest calibration standard for mercury or cyanide?	___	[✓]	___
	If yes for any of the above, was the sample diluted to obtain the result reported on Form I?	[✓]	___	___
	ACTION: If no, flag (J) as estimated the affected detects (≥ MDL) reported on Form I.			
A.1.25	**ICP-MS Tune Analysis - Form XIV**			
A.1.25.1	Was the ICP-MS instrument tuned prior to calibration?	[✓]	___	___
	ACTION: If no, reject (R) and red-line all sample data for which tuning was not performed.			
A.1.25.2	Was the tuning solution analyzed or scanned at least five times consecutively?	[✓]	___	___
	Were all the required isotopes spanning the analytical range present in the tuning solution?	[✓]	___	___
	Was the mass resolution within			

	YES	NO	N/A
0.1 amu for each isotope in the tuning solution?	[✓]	___	___
Was %RSD less than 5% for each isotope of each analyte in the tuning solution?	[✓]	___	___

ACTION:
If no for any of the above, qualify all results ≥ MDL associated with that Tune as estimated "J", and all non-detects associated with that Tune as "UJ".

A.1.26 **ICP-MS Internal Standards - Form XV**

A.1.26.1 Were the Internal Standards added to all the samples and all QC samples and calibration standards (except the Tuning Solution)?	[✓]	___	___
Were all the target analyte masses bracketed by the masses of the five internal standards?	[✓]	___	___

ACTION:
If none of the Internal Standards was added to the samples, reject (R) and red-line all the associated sample data (detects & non-detects). If internal standards were used but did not cover all the analyte masses, reject (R) and red-line only the analyte results not bracketed by the internal standard masses.

A.1.26.2 Was the intensity of an Internal Standard in each sample within ~~60-125%~~ using lab limits of the intensity of the same Internal Standard in the calibration blank?	[___]	✓	___
If no, was the original sample diluted two fold, Internal Standard added and the sample re-analyzed? 1:100 1:500	[✓]	___	___
Was the %RI for the two fold diluted sample within the acceptance limits (60-125%)?	[✓]	___	___

ACTION:
If no for any of the above, flag detects as "J" and non-detects "UJ" of all the analytes with atomic masses between the

atomic mass of the internal standard lighter

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0201

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
VWW06-SW007R-0211	1606	120		109		107		107		104		103	
ZZZZZZ	1611	121	R	110		108		107		104		103	
ZZZZZZ	1615	121	R	108		109		107		104		105	
CCV	1620	106		100		96		98		100		94	
CCB	1624	113		105		105		105		102		103	
ZZZZZZ	1629	120		118		108		108		106		96	
ZZZZZZ	1633	129	R	126	R	114		112		109		98	
ZZZZZZ	1638	131	R	129	R	116		114		110		99	
ZZZZZZ	1642	136	R	127	R	121	R	117		111		107	
ZZZZZZ	1647	131	R	127	R	114		113		109		98	
ZZZZZZ	1652	137	R	133	R	118		116		111		100	
ZZZZZZ	1656	140	R	137	R	123	R	120		112		102	
ZZZZZZ	1701	142	R	139	R	125	R	120		113		103	
ZZZZZZ	1705	144	R	140	R	125	R	121	R	113		102	
ZZZZZZ	1710	144	R	141	R	125	R	122	R	114		103	
CCV	1714	117		112		105		106		103		97	
CCB	1719	119		112		112		110		105		105	
ZZZZZZ	1723	126	R	123	R	112		111		108		98	
ZZZZZZ	1728	136	R	133	R	120		117		111		101	
VWW06-SW004-0211 (see 1:500)	1732	140	R	137	R	122	R	119		112		102	
VWW06-SW004-0211D	1736	142	R	139	R	124	R	120		113		102	
VWW06-SW004-0211S	1741	143	R	140	R	124	R	121	R	113		102	
VWW06-SW004-0211L	1745	144	R	137	R	128	R	123	R	113		110	
ZZZZZZ	1750	142	R	139	R	124	R	121	R	112		101	
ZZZZZZ	1754	145	R	143	R	126	R	122	R	114		103	
ZZZZZZ	1759	147	R	144	R	128	R	122	R	114		103	
ZZZZZZ	1803	148	R	142	R	131	R	124	R	114		110	
CCV	1808	120		114		106		106		104		96	
CCB	1812	121	R	113		111		109		104		104	
VWW06-SW005-0211 (see 1:500)	1817	129	R	126	R	114		112		108		98	

1:100 ↓ 1:500

NQ - analytes assoc ~~for~~ with non-compliant IS were reported from 1:500 DL

X1_110217B

ISM_002

FORM XV-IN

SW846

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0201

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
ZZZZZZ	1821	139	R	137	R	122	R	119		111		100	
VWW06-SW006-0211	1826	142	R	141	R	125	R	120		113		101	
ZZZZZZ	1830	145	R	144	R	126	R	122	R	113		102	
VWW06-SW007-0211	1835	148	R	146	R	127	R	123	R	113		102	
ZZZZZZ	1839	150	R	147	R	129	R	124	R	113		102	
VWW06-SW007R-0211	1844	150	R	148	R	129	R	124	R	114		102	
ZZZZZZ	1848	151	R	149	R	130	R	125	R	114		103	
CCV	1853	124	R	118		109		108		105		97	
CCB	1857	124	R	116		113		110		104		104	

1:100

1:100

1:100

see 1:500 Dilutions - No Quals Pb only reported from this run

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0201-D

ICP-MS Instrument ID: X1 Start Date: 02/16/2011 End Date: 02/16/2011

X1 110216B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
ZZZZZZ	1335	84		93		87		92		115		84	
ZZZZZZ	1339	84		93		87		92		116		84	
ZZZZZZ	1344	90		96		93		98		102		96	
ZZZZZZ	1348	84		92		90		94		99		91	
ZZZZZZ	1353	87		93		92		96		99		92	
CCV	1357	91		97		95		99		103		94	
CCB	1402	95		96		99		102		104		102	
ZZZZZZ	1406	94		95		97		101		113		102	
ZZZZZZ	1411	89		90		93		96		100		97	
CCV	1415	93		96		94		99		104		94	
CCB	1420	96		96		99		102		104		102	
PBW	1424	94		94		96		100		103		101	
LCW	1429	92		93		94		98		102		97	
ZZZZZZ	1433	99		98		100		103		106		103	
VWW06-EB02-020311	1438	99		100		101		105		106		104	
ZZZZZZ	1442	97		98		101		103		105		102	
CCV	1447	98		100		97		102		108		97	
CCB	1451	101		99		102		105		108		104	
ZZZZZZ	1456	108		114		102		107		111		92	
VWW06-SW003-0211	1500	117		124	R	110		113		113		95	
ZZZZZZ	1504	123	R	132	R	116		118		117		98	
ZZZZZZ	1509	127	R	136	R	120		122	R	119		99	
ZZZZZZ	1513	130	R	139	R	122	R	123	R	120		100	
ZZZZZZ	1518	135	R	138	R	128	R	127	R	123	R	111	
ZZZZZZ	1522	129	R	138	R	120		121	R	117		98	
ZZZZZZ	1527	132	R	142	R	124	R	124	R	119		99	
ZZZZZZ	1531	134	R	143	R	125	R	124	R	119		98	
ZZZZZZ	1536	139	R	144	R	133	R	130	R	122	R	111	
CCV	1540	114		118		109		112		112		101	
CCB	1545	113		115		113		115		112		108	

1:50 1:500 *

* As Co Cr Cu reported from 1:500 No Quals

X1_110216B

ISM_002

FORM XV-IN

SW846

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0201-D

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
ZZZZZZ	1606	120		109		107		107		104		103	
VWW06-SW007R-0211	1611	121	R	110		108		107		104		103	
ZZZZZZ	1615	121	R	108		109		107		104		105	
CCV	1620	106		100		96		98		100		94	
CCB	1624	113		105		105		105		102		103	
ZZZZZZ	1629	120		118		108		108		106		96	
ZZZZZZ	1633	129	R	126	R	114		112		109		98	
ZZZZZZ	1638	131	R	129	R	116		114		110		99	
ZZZZZZ	1642	136	R	127	R	121	R	117		111		107	
ZZZZZZ	1647	131	R	127	R	114		113		109		98	
ZZZZZZ	1652	137	R	133	R	118		116		111		100	
ZZZZZZ	1656	140	R	137	R	123	R	120		112		102	
ZZZZZZ	1701	142	R	139	R	125	R	120		113		103	
ZZZZZZ	1705	144	R	140	R	125	R	121	R	113		102	
ZZZZZZ	1710	144	R	141	R	125	R	122	R	114		103	
CCV	1714	117		112		105		106		103		97	
CCB	1719	119		112		112		110		105		105	
ZZZZZZ	1723	126	R	123	R	112		111		108		98	
ZZZZZZ	1728	136	R	133	R	120		117		111		101	
ZZZZZZ	1732	140	R	137	R	122	R	119		112		102	
ZZZZZZ	1736	142	R	139	R	124	R	120		113		102	
ZZZZZZ	1741	143	R	140	R	124	R	121	R	113		102	
ZZZZZZ	1745	144	R	137	R	128	R	123	R	113		110	
VWW06-SW004-0211	1750	142	R	139	R	124	R	121	R	112		101	
VWW06-SW004-0211D	1754	145	R	143	R	126	R	122	R	114		103	
VWW06-SW004-0211S	1759	147	R	144	R	128	R	122	R	114		103	
VWW06-SW004-0211L	1803	148	R	142	R	131	R	124	R	114		110	
CCV	1808	120		114		106		106		104		96	
CCB	1812	121	R	113		111		109		104		104	
ZZZZZZ	1817	129	R	126	R	114		112		108		98	

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501977

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0201-D

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
VWW06-SW005-0211	1821	139	R	137	R	122	R	119		111		100	
ZZZZZZ	1826	142	R	141	R	125	R	120		113		101	
VWW06-SW006-0211	1830	145	R	144	R	126	R	122	R	113		102	
ZZZZZZ	1835	148	R	146	R	127	R	123	R	113		102	
VWW06-SW007-0211	1839	150	R	147	R	129	R	124	R	113		102	
ZZZZZZ	1844	150	R	148	R	129	R	124	R	114		102	
VWW06-SW007R-0211	1848	151	R	149	R	130	R	125	R	114		103	
CCV	1853	124	R	118		109		108		105		97	
CCB	1857	124	R	116		113		110		104		104	

1:100

1:100

1:100

1:100

QAC 4/16/11

Pb only - No Quals

X1_110217B

ISM_002

FORM XV-IN

SW846

than the affected internal standard, and the atomic mass of the internal standard heavier than the affected internal standard.

A.1.27 Percent Solids of Sediments

A.1.27.1 Are percent solids in sediment(s):

< 50%? ___ [___] ✓

all waters

ACTION:
If yes, qualify as estimated (J) all detects and non-detects of a sample that has percent solids less than 50%(i.e.,moisture content greater than 50%).

NOTE:
Flag(J) only the sample results that were not previously flagged due to other QC criteria.

Inorganic Data Review Narrative

Case# _____ Site: _____ Matrix: Soil ____

SDG# _____ Lab: _____ Water ____

Sampling Team: _____ Reviewer: _____ Other _____

A.2.1 Data Validation Flags:
The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as estimated

R and Red-Line - A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results ≥ MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully usable.

A.2.2 Laboratory Qualifiers:
The CLP laboratory applies a contractual qualifier on all

This SDG contains hexavalent chromium analysis using SW-846 7196A. Resubmissions were not required.

Laboratory: PEL

HOLDING TIMES

Sampling Date: 2/3/11
Received Date: 2/4/11
Analysis Dates: 2/4/11
Cooler temps: 1.6-5.8°C

All total and dissolved samples exceeded the required 24 hour holding time by 2-8 hours; therefore results were qualified as estimated (J/UJ).

CALIBRATIONS

All initial calibration criteria were met. Calibration verification criteria were met for all ICV and CCV standards. No qualifications were required.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- Apply the same data validation guidelines to any associated calibration, preparation, and field QC blanks and all associated samples.
- Qualification/Action codes:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U at LOD	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD
R or J_+	The blank contaminant concentration was greater than the LOD and the sample result is greater than the LOD but less than 10X the blank contaminant concentration. The reported results are flagged either as rejected R or biased high J+ based on the professional judgment of the validator.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	RL (LOD)
VWW06-EB01-020311 (total)	hexavalent chromium		0.007
VWW06-EB01-020311 (dissolved)	hexavalent chromium	0.007J	0.007

Sample ID	Analyte	Q Flag	Q Code
no qualifications required			

The concentration noted for the CCBs is the highest concentration in all the CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for noted CCB contamination. See worksheets for associations. Samples are qualified for field QC blank contamination based on QC tracking provided by CH2M HILL. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment.

LCS

All LCS recoveries and RPDs were acceptable.

MATRIX SPIKE/DUPLICATE SUMMARY

The MS / MSD pair analyzed for sample VWW06-SW004-0211exhibited acceptable recoveries and RPD.

FIELD DUPLICATE SAMPLE SUMMARY

Note: Field duplicate results are assessed only if both results are above the CRDL.

Sample ID: **VWW06-SW007-0211 (total)** **Duplicate Sample ID:** **VWW06-SW007P-0211 (total)**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium	0.012	0.022	59%
			#DIV/0!
			#DIV/0!

Comments: No qualifications required.

Sample ID: **VWW06-SW007-0211 (dissolved)** **Duplicate Sample ID:** **VWW06-SW007P-0211 (dissolved)**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium	0.009	0.008	12%
			#DIV/0!
			#DIV/0!

Comments: No qualifications required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Detection limits were acceptable. Raw data was verified.

Reviewer _____ **Date:** 4/11/11

CH2M HILL
SWMU 6 CTO-111
SDG# 3501977

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: The following samples were analyzed out of hold: VWW06-EB01-020311, VWW06-SW003-0211, VWW06-SW004-0211, VWW06-SW004-0211MS, VWW06-SW004-0211SD, VWW06-SW005-0211, VWW06-SW006-0211, VWW06-SW007-0211, VWW06-SW007R-0211. The client knew samples were received out of hold. The samples were analyzed as soon as they were logged in to get as close to the holding time as possible.

III. METHODS

Analyses were performed according to PEL Laboratory's Standard Operating Procedures and EPA Method 7196A.

IV. PREPARATION

There is no preparation step for this test.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/04/2011

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: The following samples were analyzed out of hold: VWW06-EB01-020311, VWW06-SW003-0211, VWW06-SW004-0211, VWW06-SW004-0211MS, VWW06-SW004-0211SD, VWW06-SW005-0211, VWW06-SW006-0211, VWW06-SW007-0211, VWW06-SW007R-0211. The client knew samples were received out of hold. The samples were analyzed as soon as they were logged in to get as close to the holding time as possible.

III. METHODS

Analyses were performed according to PEL Laboratory's Standard Operating Procedures and EPA Method 7196A.

IV. PREPARATION

There is no preparation step for this test.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501977

Client: CH2M Hill

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** **03/04/2011**

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

April 18, 2011
SDG# 3501993, PEL; K0204, Mitkem
Vieques Island, Puerto Rico

Dear Ms. Weber,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 3501993/K0204. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, 8081B-Rev. 1.0, October 2006-SOP HW-44, 8082A- Rev 1, October 2006-SOP# HW-45, and ILM05.3-Rev. 13, September 2006-SOP #HW-2) and professional judgment. The SOP for the inorganic parameters (metals) is used but is modified as necessary to reflect the QC requirements of the method and the site SAP. Region II has not developed a validation checklist SOP for the method used to assess hexavalent chromium in this SDG (SW-846 method 7196A). Alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	VOA	SV	Pest	PCB	Metals 6010B	Metals 6020	Hg	Cr(VI)
VVW06-SD003-0211	350199301	soil	X	X	X	X	X	X	X	X
VVW06-SD004-0211	350199304	soil	X	X	X	X	X	X	X	X
VVW06-SD005-0211	350199305	soil	X	X	X	X	X	X	X	X
VVW06-SD006-0211	350199306	soil	X	X	X	X	X	X	X	X
VVW06-SD006P-0211	350199307	soil	X	X	X	X	X	X	X	X
VVW06-SD007-0211	350199308	soil	X	X	X	X	X	X	X	X
VVW06-SD008-0211	350199309	soil	X	X	X	X	X	X	X	X
VVW06-SD009-0211	350199310	soil	X	X	X	X	X	X	X	X
VVW06-SD0010-0211	350199311	soil	X	X	X	X	X	X	X	X
VVW06-SD0011-0211	350199312	soil	X	X	X	X	X	X	X	X
VVW06-SD0011P-0211	350199313	soil	X	X	X	X	X	X	X	X
VVW06-EB01-020411	350199314	water	X	X	X	X	X	X	X	X
VVW06-TB01-020411	350199315	soil	X							
VVW06-SD003-0211 MS	350199301MS	soil	X	X	X	X	X	X	X	X
VVW06-SD003-0211 MSD	350199301MSD	soil	X	X	X	X	X	X	X	X

*Please note – the ID in the Lab ID column is the PEL Lab ID.

The following quality control samples were provided with this SDG: sample VWW06-EB01-020411 - equipment blank; sample VWW06-TB01-020411- trip blank; sample VWW06-SD006P-0211- field duplicate of sample VWW06-SD006-0211 and sample VWW06-SD0011P-0211- field duplicate of sample VWW06-SD0011-0211.

The samples were evaluated based on the following criteria:

• Data Completeness	*
• Sample Condition	
• Technical Holding Times	
• GC/MS Tuning	*
• GC Performance	*
• ICP MS Tuning	*
• Initial/Continuing Calibrations	*
• ICSA/ICSAB Standards	*
• LLQ Standards	*
• Blanks	
• Internal Standards	*
• Surrogate Recoveries	
• Laboratory Control Samples	
• Matrix Spike Recoveries	
• Matrix Duplicate RPDs	
• Serial Dilutions	
• Field Duplicates	
• Identification/Quantitation	
• Reporting Limits	*
• Tentatively Identified Compounds	NA

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. Please note that when a compound or analyte is flagged due to blank contamination the BL qualifier code takes precedence over all other qualifier codes except a code that explains rejected data.

All Fractions

Several samples were received in coolers that were at 9.9 °C – 10.5 °C. All results for these samples were flagged as estimated J/UJ based on the method and the client Sampling and Analysis Plan (SAP) requirement that cooler temperatures be maintained at 4°C +/- 2°C.

All results for one soil sample were qualified as estimated due to high percent moisture content.

VOA

Five samples exhibited low surrogate recoveries that resulted in qualifying all results as estimated. Two samples exhibited high surrogate recoveries; therefore positive results were qualified as estimated.

Two samples duplicate pairs were submitted, qualifications were required due to non-comparable results.

According to the case narrative, a computer problem occurred which prevented the laboratory from reproducing the raw data of the calibration associated with the initial analysis of all field samples. The samples were re-analyzed and both analyses are provided in the data package. However since the validator is required to confirm calculations and the raw data from the initial analysis calibration was not provided for calculations to be completed, the re-analysis was used. Therefore the initial analysis of all field samples was excluded in favor of the reanalysis.

SVOA

Several soil samples were received at the laboratory in coolers at high temperatures; therefore results were qualified as estimated.

Two samples exhibited non-compliant surrogate recoveries that resulted in qualification to the data.

The LCS associated with all the field samples exhibited low recoveries for one compound; therefore results for that compound were qualified as estimated.

Qualifications were added to the sample associated with the matrix spike and matrix spike duplicate due to non-compliant recoveries.

Comparable results were not exhibited in one of the field duplicate pairs which resulted in qualifications to the data.

Pesticides

Three samples required qualification due to low surrogate recoveries and three samples required qualification for high surrogate recoveries.

The MS/MSD pair exhibited several compounds with non-compliant recoveries. Qualifications were required in the native sample only.

One of the field duplicate pairs exhibited one non-compliant RPD. Qualification was required for that compound in the field duplicate pair only.

Some reported positive results required qualification based on column quantitation %Ds greater than 40%.

PCBs

One of the field duplicate pairs exhibited one non-compliant RPD. Qualification was required for that compound in the field duplicate pair only.

Some reported positive results required qualification based on column quantitation %Ds greater than 40%.

Metals

Laboratory blanks exhibited contamination that resulted in qualifications to the sample results.

The submitted MS/MSD pair exhibited recoveries that were non-compliant. Therefore, qualifications to the data were required.

The matrix duplicate results exhibited one non-compliant RPD. Results were qualified as estimated for the non-compliant analyte.

The serial dilution analysis exhibited one non-compliant %D. Results were qualified as estimated for the non-compliant analyte.

One of the field duplicate pairs exhibited non-compliant RPDs. Qualifications were required in the field duplicate pair only.

Hexavalent Chromium

One sample exceeded the required 24-hour holding time; therefore the positive result was qualified as estimated.

Several soil samples were received at the laboratory in coolers at high temperatures; therefore results were qualified as estimated.

Results for one soil sample were qualified as estimated due to high percent moisture content.

Comparable results were not exhibited in one of the field duplicate pairs which resulted in qualifications to the data.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the metals fractions. The low level quantitation standard summary data was not present in the data packages. Both PEL and Mitkem were notified and they submitted responses to the request. Copies of the responses are included in the validation worksheets section of this report.

Sample Condition

All Fractions

The following soil samples contained 50-90% water. All reported results in the sample required qualification as estimated.

Sample ID	% Moisture	Qualifier	Q Code
VWW06-SD009-0211	67.9	J/UJ	%SOL

All Fractions except VOA

Samples VWW06-SD005-0211, VWW06-SD006-0211, VWW06-SD006P-0211, VWW06-SD007-0211, VWW06-SD008-0211, VWW06-SD009-0211, VWW06-SD0010-0211, VWW06-SD0011-0211 and VWW06-SD0011P-0211 were received at the laboratory in two coolers at temperatures of 9.9°C and 10.5°C. Samples were maintained at this temperature for several days as samples were collected on 2/4/11 and received at the laboratory on 2/7/11. Both the method and the client SAP require that samples be stored at 4°C; therefore due to the temperature non-compliance samples were qualified as estimated (J/UJ), qualifier code: OT.

Technical Holding Times

According to chain of custody records, sampling was performed on 2/4/11 and samples were received at PEL on 2/7/11 and at Mitkem on 2/9/11. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

Hexavalent Chromium

Sample VWW06-EB01-020411 exceeded the 24 hour holding time by 2 days; therefore the positive result was qualified as estimated (J), (qualifier code: HT).

Blanks

Metals

Associated blanks exhibited contamination as noted in the following table.

Blank ID	Analyte	Concentration	Action Level
ICB X1_110223A	selenium	0.172J ug/L	LOD

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag
VWW06-SD004-0211, VWW06-SD007-0211, VWW06-SD009-0211	selenium	U at LOD

Surrogates

VOA

The following samples exhibited non-compliant recoveries for the surrogates listed in the table below, qualifications were applied as stated.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VWW06-SD0011-0211RE	4-bromofluorobenzene	79.6	85-120	J/UJ	SSL
VWW06-SD003-0211RE	toluene-d8	83.6	85-115		
	4-bromofluorobenzene	78.8	85-120		
VWW06-SD004-0211RE	toluene-d8	81.0	85-115		
	4-bromofluorobenzene	74.0	85-120		
VWW06-SD006-0211RE	toluene-d8	83.8	85-115		
	4-bromofluorobenzene	75.6	85-120		
VWW06-SD006P-0211RE	4-bromofluorobenzene	134	85-120	J	SSH
VWW06-SD007-0211RE	4-bromofluorobenzene	84.2	85-120	J/UJ	SSL
VWW06-SD009-0211RE	4-bromofluorobenzene	130.0	85-120	J	SSH

SVOA

The following samples exhibited non-compliant recoveries for the surrogates listed in the table below; qualifications were applied as stated.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VWW06-SD006P-0211	p-terphenyl-d14	146	30-125	J	SSH
	2-fluorobiphenyl	163	45-105		
VWW06-SD008-0211	p-terphenyl-d14	29.4	30-125	J/UJ	SSL
	2-fluorobiphenyl	33.5	45-105		

Pesticides

The following samples exhibited non-compliant recoveries for the surrogate listed in the table below; qualifications were applied as noted.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VWW06-SD0010-0211	2,4,5,6-tetrachloro-m-xylene decachlorobiphenyl	49.5 28	70-125 55-130	J/UJ	SSL
VWW06-SD006-0211	2,4,5,6-tetrachloro-m-xylene decachlorobiphenyl	54.6 34.6	70-125 55-130	J/UJ	SSL
VWW06-SD008-0211	2,4,5,6-tetrachloro-m-xylene	62.7	70-125	J/UJ	SSL
VWW06-SD003-0211	2,4,5,6-tetrachloro-m-xylene	150	70-125	J	SSH
VWW06-SD004-0211	2,4,5,6-tetrachloro-m-xylene	141	70-125	J	SSH
VWW06-SD009-0211	2,4,5,6-tetrachloro-m-xylene	135	70-125	J	SSH

Matrix Spike Recoveries

SVOA

The matrix spike and matrix spike duplicate associated with sample VWW06-SD003-0211 exhibited non-compliant recoveries for the compounds listed in the table below, qualifications were applied as stated.

Sample ID	Compound	% MS Rec	% MSD Rec	QC Limits	Qualifier	Q Code
VWW06-SD003-0211	benzo(a)pyrene	117	0	50-110	J/UJ	MSL
	fluoranthene	126	50	55-115		
	benzo(b)fluoranthene	111*	0	45-115		
	benzo(g,h,i)perylene	103*	0	40-125		
	benzo(k)fluoranthene	59.8*	8.9	15-125		
	indeno(1,2,3-cd)pyrene	97.4*	0.5	40-120		

**recovery within criteria, listed for information purposes only- qualification due to zero or below 10 percent recovery in MSD*

Pesticides

The matrix spike and matrix spike duplicate associated with sample VWW06-SD003-0211 exhibited non-compliant recoveries/RPDs as noted in the table below. Qualifications were applied to the native sample only.

Sample ID	Compound	% Rec	RPD	Qualifier	Q Code
VWW06-SD003-0211	delta-BHC	36.4/51.8	36.9	J/UJ	MSL
	aldrin	34.6/33.6			
	heptachlor epoxide	25/27.3			
	alpha-chlordane	394/63.5	143.48.9		
	4,4'-DDE	130/284	34.7	J	MSH

Metals

The matrix spike pair submitted in this SDG exhibited non-compliant %R's for several analytes, requiring qualification in the field samples. A summary of these non-

compliances and affected samples are noted in the following table. Please note that results were not qualified unless both recoveries were non-compliant. Also, criteria did not apply to several analytes due to the abundance of the target analyte in the native sample. Further, results were not rejected unless recoveries were both above 200%.

MS	Analytes	Samples	%R	Q Flag	Q Code
VWW06-SD003-0211	aluminum	all soil samples	128.9/168.1	J+	MSH
	copper		146.2/492.8		
	magnesium		121.9/142.2		
	sodium		154.2/186.3		
	antimony		65.8/58.8	J/UJ	MSL

Matrix Duplicates

Metals

The matrix duplicate submitted in this SDG exhibited a non-compliant RPD for one analyte, requiring qualification in the field samples. A summary of this non-compliance and affected samples are noted in the following table.

MD	Analytes	Samples	%RPD	Q Flag	Q Code
VWW06-SD003-0211	aluminum	all soil samples	55.8	J/UJ	MDP

Serial Dilutions

Metals

The serial dilution submitted in this SDG exhibited a non-compliant %D for one analyte, requiring qualification in the field samples. A summary of this non-compliance and affected samples are noted in the following table.

SD	Analytes	Samples	%D	Q Flag	Q Code
VWW06-SD003-0211	nickel	all soil samples	48	J/UJ	SD

Laboratory Control Sample

SVOA

The LCS associated with all field samples exhibited low recovery for 1-methylnaphtalene at 73.6% (QC limits 77-140%); therefore results for this compound were qualified as estimated (J/UJ), qualifier code: BSL.

Field Duplicate

VOA

Sample VWW06-SD0011-0211RE and duplicate sample VWW06-SD0011P-0211RE did not exhibit comparable results for tetrachloroethene with 200% RPD; therefore results for this compound were qualified as estimated in these samples, qualifier code: FD.

Sample VWW06-SD006-0211RE and duplicate sample VWW06-SD006P-0211RE did not exhibit comparable results for acetone with 200% RPD; therefore results for this compound were qualified as estimated in these samples, qualifier code: FD.

SVOA

Sample VWW06-SD0011-0211 and duplicate sample VWW06-SD0011P-0211 did not exhibit comparable results for phenanthrene with 200% RPD; therefore results for this compound were qualified as estimated in these samples, qualifier code: FD.

Pesticides

Sample VWW06-SD006-0211 and duplicate sample VWW06-SD006P-0211 did not exhibit comparable results for 4, 4'-DDE with 68% RPD; therefore results for this compound were qualified as estimated J in the field duplicate pair only with a qualifier code of FD.

PCBs

Sample VWW06-SD0011-0211 and duplicate sample VWW06-SD0011P-0211 did not exhibit comparable results for AR1254 with 96% RPD; therefore results for this compound were qualified as estimated J in the field duplicate pair only with a qualifier code of FD.

Metals

The field duplicate pair of samples VWW06-SD006-0211/VWW06-SD006P-0211exhibited several analytes with high RPDs (>30% per SAP). A summary of the non-compliance results and affected samples are noted in the following table. Qualifications were applied to the field duplicate pair only.

Field Dup Pair ID	Analyte	RPD	Qualifier	Q Code
VWW06-SD006-0211 VWW06-SD006P-0211	barium	52	J	FD
	copper	61		
	iron	35		
	lead	82		
	mercury	31		
	nickel	46		
	zinc	51		

Hexavalent Chromium

Sample VWW06-SD0011-0211RE and duplicate sample VWW06-SD0011P-0211RE did not exhibit comparable results for hexavalent chromium with 101% RPD; therefore results for this compound were qualified as estimated in these samples, qualifier code: FD.

Identification/Quantitation

VOA

According to the case narrative, a computer problem occurred which prevented the laboratory from reproducing the raw data of the calibration associated with the initial analysis of all field samples. The samples were re-analyzed and both analyses are provided in the data package. However since the validator is required to confirm calculations and the raw data from the initial analysis calibration was not provided for calculations to be completed, the re-analysis was used. Therefore the initial analysis of all field samples was excluded in favor of the reanalysis.

Pesticides

Qualifications were required in the samples due to high (>40%) column quantitation %Ds. Region II guidelines were followed in applying these qualifications. Sample results were flagged as noted in the following table.

Sample ID	Compound	Column Quant %D	Qualifier	Q Code
VWW06-SD03-0211	4,4'-DDT	56.18	J	2C
VWW06-SD0010-0211	4,4'-DDE	53.66	J	
	4,4'-DDT	102.44	U at LOD	
VWW06-SD0011P-0211	4,4'-DDD	70.92	J	

PCBs

Qualifications were required in the samples due to high (>40%) column quantitation %Ds. Region II guidelines were followed in applying these qualifications. Sample results were flagged as noted in the following table.

Sample ID	Compound	Column Quant %D	Qualifier	Q Code
VWW06-SD006P-0211	AR1254	60.47	J	2C
VWW06-SD0010-0211	AR1254	66.67	J	
VWW06-SD0011-0211	AR1254	80	NJ	

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff
President

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SD009-0211RE	all results	+/-	J/UJ	%SOL
VWW06-SD0011-0211RE, VWW06-SD003-0211RE, VWW06-SD004-0211RE, VWW06-SD006-0211RE, VWW06-SD007-0211RE	all results	+/-	J/UJ	SSL
VWW06-SD006P-0211RE, VWW06-SD009-0211RE*	all results	+	J	SSH
VWW06-SD0011-0211RE**, VWW06-SD0011P-0211RE	tetrachloroethene	+/-	J/UJ	FD
VWW06-SD006-0211RE**, VWW06-SD006P-0211RE	acetone	+/-	J/UJ	FD
initial analysis of all field samples	all results	+/-	exclude	RE

**final qualifier due to high moisture content*
***final qualifier due to non-compliant surrogate recoveries*

SVOA

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SD009-0211*	all results	+/-	J/UJ	%SOL
VWW06-SD005-0211, VWW06-SD006-0211, VWW06-SD006P-0211, VWW06-SD007-0211, VWW06-SD008-0211, VWW06-SD009-0211, VWW06-SD0010-0211, VWW06-SD0011-0211, VWW06-SD0011P-0211	all results	+/-	J/UJ	OT
VWW06-SD006P-0211*	all results	+	J	SSH
VWW06-SD008-0211*	all results	+/-	J/UJ	SSL
VWW06-SD003-0211	benzo(a)pyrene fluoranthene benzo(b)fluoranthene benzo(g,h,i)perylene benzo(k)fluoranthene indeno(1,2,3-cd)pyrene	+/-	J/UJ	MSL
all field samples*	1-methylnaphtalene	+/-	J/UJ	BSL
VWW06-SD0011-0211*, VWW06-SD0011P-0211*	phenanthrene	+/-	J/UJ	FD

**final qualifier due to high cooler temperature, qualifier code OT*

Pesticides

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SD009-0211*	all compounds	+/-	J/UJ	%SOL
VWW06-SD005-0211, VWW06-SD006-0211, VWW06-SD006P-0211, VWW06-SD007-0211, VWW06-SD008-0211, VWW06-SD009-0211, VWW06-SD0010-0211, VWW06-SD0011-0211, VWW06-SD0011P-0211	all compounds	+/-	J/UJ	OT
VWW06-SD0010-0211*, VWW06-SD006-0211*, VWW06-SD008-0211*	all compounds	+/-	J/UJ	SSL
VWW06-SD003-0211, VWW06-SD004-0211, VWW06-SD009-0211*	all compounds	+	J	SSH

Summary of Data Qualifications

Pesticides, continued

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SD003-0211	delta-BHC aldrin heptachlor epoxide alpha-chlordane	+/-	J/UJ	MSL
VWW06-SD003-0211**	4,4'-DDE	+	J	MSH
VWW06-SD006-0211*, VWW06-SD006P-0211*	4,4'-DDE	+	J	FD
VWW06-SD03-0211**	4,4'-DDT	+JP	J	2C
VWW06-SD0010-0211*	4,4'-DDE	+P	J	2C
	4,4'-DDT	+JP	U at LOD	2C
VWW06-SD0011P-0211*	4,4'-DDD	+P	J	2C

**final qualifier due to high cooler temperature, qualifier code OT with the exception of 4,,4'-DDT in VWW06-SD0010-0211 – final qualifier code 2C*
***final qualifier due to high surrogate recoveries, qualifier code SSH*

PCBs

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SD009-0211*	all compounds	+/-	J/UJ	%SOL
VWW06-SD005-0211, VWW06-SD006-0211, VWW06-SD006P-0211, VWW06-SD007-0211, VWW06-SD008-0211, VWW06-SD009-0211, VWW06-SD0010-0211, VWW06-SD0011-0211, VWW06-SD0011P-0211	all compounds	+/-	J/UJ	OT
VWW06-SD0011-0211*, VWW06-SD0011P-0211*	AR1254	+	J	FD
VWW06-SD006P-0211*	AR1254	+JP	J	2C
VWW06-SD0010-0211*	AR1254	+P	J	2C
VWW06-SD0011-0211*	AR1254	+P	NJ	2C

**final qualifier due to high cooler temperature, qualifier code OT. Note – AR1254 in VWW06-SD0011-0211 was flagged as NJ with OT as final qualifier code*

Metals

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD009-0211*	all analytes	+/-	J/UJ	%SOL
VWW06-SD005-0211, VWW06-SD006-0211, VWW06-SD006P-0211, VWW06-SD007-0211, VWW06-SD008-0211, VWW06-SD009-0211, VWW06-SD0010-0211, VWW06-SD0011-0211, VWW06-SD0011P-0211	all analytes	+/-	J/UJ	OT
VWW06-SD004-0211, VWW06-SD007-0211, VWW06-SD009-0211	selenium**	+J	U at LOD	MBL
all soil samples*	aluminum copper magnesium sodium	+	J	MSH
all soil samples*	antimony	+/-	J/UJ	MSL
all soil samples*	copper#	+/-	J/UJ	MDP
all soil samples*	nickel	+/-	J/UJ	SD

Summary of Data Qualifications

Metals, continued

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD006-0211*, VWW06-SD006P-0211*	barium copper iron lead mercury nickel zinc	+	J	FD

**final qualifier due to high cooler temperature, qualifier code OT in all samples except VWW06-SD003-0211 & VWW06-SD0040211*
***final qualifier due to blank contamination, qualifier code MBL*
#In samples VWW06-SD003-0211 & VWW06-SD0040211the final qualifier code is MSH for copper.

Hexavalent Chromium

Sample ID	Compound	Results	Q flag	Q Code
VWW06-EB01-020411	hexavalent chromium	+	J	HT
VWW06-SD005-0211, VWW06-SD006-0211, VWW06-SD006P-0211, VWW06-SD007-0211, VWW06-SD008-0211, VWW06-SD009-0211, VWW06-SD0010-0211, VWW06-SD0011-0211, VWW06-SD0011P-0211	hexavalent chromium	+/-	J/UJ	OT
VWW06-SD009-0211*	hexavalent chromium	+/-	J/UJ	%SOL
VWW06-SD0011-0211*, VWW06-SD0011P-0211*	hexavalent chromium	+	J	FD

**final qualifier due to high cooler temperature, qualifier code OT*

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the FB result is less or greater than the RL.
R -	Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.
J -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

General Abbreviations

RL/LOD	reporting limit
PQL	practical quantitation limit
IDL	instrument detection limit
MDL	method detection limit
CRQL/LOQ	contract required quantitation limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301 Lab File ID: 1993-1.D

Sample wt/vol: 4.23 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1423

PercentSolids: 52 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	2.7	U	1.4	2.7	4.5
74-87-3	Chloromethane	1.7	U	0.86	1.7	4.5
75-01-4	Vinyl chloride	2.7	U	1.4	2.7	4.5
74-83-9	Bromomethane	4.5	U	2.7	4.5	4.5
75-00-3	Chloroethane	3.4	U	1.7	3.4	4.5
75-69-4	Trichlorofluoromethane	2	U	1	2	4.5
75-35-4	1,1-Dichloroethene	1.5	U	0.77	1.5	4.5
75-15-0	Carbon disulfide	4	J	3.4	4.5	4.5
75-09-2	Methylene chloride	5.5	U	2.7	5.5	11.4
156-60-5	trans-1,2-Dichloroethene	1.8	U	0.89	1.8	4.5
75-34-3	1,1-Dichloroethane	1.5	U	0.77	1.5	4.5
67-64-1	Acetone	212		3	5.9	22.7
156-59-2	cis-1,2-Dichloroethene	2.8	U	1.4	2.8	4.5
74-97-5	Bromochloromethane	4.1	U	2	4.1	4.5
78-93-3	2-Butanone	25.9		3.2	6.4	22.7
67-66-3	Chloroform	2.4	U	1.2	2.4	4.5
71-55-6	1,1,1-Trichloroethane	1.4	U	0.73	1.4	4.5
56-23-5	Carbon tetrachloride	2.7	U	1.4	2.7	4.5
71-43-2	Benzene	2.3	U	1.1	2.3	4.5
107-06-2	1,2-Dichloroethane	4.5	U	2.3	4.5	11.4
79-01-6	Trichloroethene	2	U	1	2	4.5
78-87-5	1,2-Dichloropropane	2.9	U	1.4	2.9	4.5
75-27-4	Bromodichloromethane	1.4	U	0.73	1.4	4.5
10061-01-5	cis-1,3-Dichloropropene	1.9	U	0.95	1.9	4.5
108-10-1	4-Methyl-2-pentanone	7.3	U	3.6	7.3	22.7
108-88-3	Toluene	1.3	U	0.66	1.3	4.5

exclude RE

180311 1923

Form I

VWW 04/14/11

018

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301 Lab File ID: 1993-1.D

Sample wt/vol: 4.23 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1423

PercentSolids: 52 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	4.5	U	2.3	4.5	4.5
79-00-5	1,1,2-Trichloroethane	3.7	U	1.9	3.7	4.5
127-18-4	Tetrachloroethene	5		2.1	4.2	4.5
591-78-6	2-Hexanone	5.9	U	3	5.9	22.7
124-48-1	Dibromochloromethane	2.1	U	1	2.1	4.5
106-93-4	1,2-Dibromoethane(EDB)	3.7	U	1.9	3.7	4.5
108-90-7	Chlorobenzene	1.6	U	0.8	1.6	4.5
100-41-4	Ethylbenzene	3.1	U	1.6	3.1	4.5
100-42-5	Styrene	1.3	U	0.64	1.3	4.5
75-25-2	Bromoform	2.1	U	1	2.1	4.5
98-82-8	Isopropylbenzene (Cumene)	2.7	U	1.4	2.7	4.5
79-34-5	1,1,2,2-Tetrachloroethane	2.7	U	1.3	2.7	4.5
541-73-1	1,3-Dichlorobenzene	2	U	1	2	11.4
106-46-7	1,4-Dichlorobenzene	3	U	1.5	3	11.4
95-50-1	1,2-Dichlorobenzene	2.5	U	1.3	2.5	11.4
96-12-8	1,2-Dibromo-3-chloropropane	11.4	U	6.4	11.4	11.4
120-82-1	1,2,4-Trichlorobenzene	2.9	U	1.4	2.9	11.4
87-61-6	1,2,3-Trichlorobenzene	2.8	U	1.4	2.8	11.4
1330-20-7	Xylene (total)	3.1	U	1.5	3.1	9.1
1634-04-4	MTBE	2	U	0.98	2	4.5
76-13-1	1,1,2-Trichlorotrifluoroethane	2.9	U	1.4	2.9	4.5
110-82-7	Cyclohexane	4.5	U	2.3	4.5	4.5
79-20-9	Methyl Acetate	9.1	U	4.5	9.1	11.4
108-87-2	Methyl Cyclohexane	2	U	0.98	2	4.5

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD003-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301RE1 Lab File ID: 1993-1.D

Sample wt/vol: 4.54 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1149

PercentSolids: 52 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	2.5 UJ SSL	U	1.3	2.5	4.2
74-87-3	Chloromethane	1.6	U	0.8	1.6	4.2
75-01-4	Vinyl chloride	2.5	U	1.3	2.5	4.2
74-83-9	Bromomethane	4.2	U	2.5	4.2	4.2
75-00-3	Chloroethane	3.1	U	1.6	3.1	4.2
75-69-4	Trichlorofluoromethane	1.9	U	0.93	1.9	4.2
75-35-4	1,1-Dichloroethene	1.4	U	0.72	1.4	4.2
75-15-0	Carbon disulfide	4 J	J	3.2	4.2	4.2
75-09-2	Methylene chloride	5.1 UJ	U	2.5	5.1	10.6
156-60-5	trans-1,2-Dichloroethene	1.6	U	0.82	1.6	4.2
75-34-3	1,1-Dichloroethane	1.4	U	0.72	1.4	4.2
67-64-1	Acetone	80.7 J		2.8	5.5	21.2
156-59-2	cis-1,2-Dichloroethene	2.6 UJ	U	1.3	2.6	4.2
74-97-5	Bromochloromethane	3.8 UJ	U	1.9	3.8	4.2
78-93-3	2-Butanone	23.9 J		3	5.9	21.2
67-66-3	Chloroform	2.3 UJ	U	1.1	2.3	4.2
71-55-6	1,1,1-Trichloroethane	1.4	U	0.68	1.4	4.2
56-23-5	Carbon tetrachloride	2.5	U	1.3	2.5	4.2
71-43-2	Benzene	2.1	U	1	2.1	4.2
107-06-2	1,2-Dichloroethane	4.2	U	2.1	4.2	10.6
79-01-6	Trichloroethene	1.9	U	0.93	1.9	4.2
78-87-5	1,2-Dichloropropane	2.7	U	1.3	2.7	4.2
75-27-4	Bromodichloromethane	1.4	U	0.68	1.4	4.2
10061-01-5	cis-1,3-Dichloropropene	1.8	U	0.89	1.8	4.2
108-10-1	4-Methyl-2-pentanone	6.8	U	3.4	6.8	21.2
108-88-3	Toluene	1.2	U	0.61	1.2	4.2

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD003-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301RE1 Lab File ID: 1993-1.D

Sample wt/vol: 4.54 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1149

PercentSolids: 52 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	4.2 UJ SSL	U	2.1	4.2	4.2
79-00-5	1,1,2-Trichloroethane	3.5 UJ	U	1.7	3.5	4.2
127-18-4	Tetrachloroethene	2.8 J	J	2	3.9	4.2
591-78-6	2-Hexanone	5.5 UJ	U	2.8	5.5	21.2
124-48-1	Dibromochloromethane	1.9	U	0.97	1.9	4.2
106-93-4	1,2-Dibromoethane(EDB)	3.5	U	1.7	3.5	4.2
108-90-7	Chlorobenzene	1.5	U	0.74	1.5	4.2
100-41-4	Ethylbenzene	2.9	U	1.5	2.9	4.2
100-42-5	Styrene	1.2	U	0.59	1.2	4.2
75-25-2	Bromoform	1.9	U	0.97	1.9	4.2
98-82-8	Isopropylbenzene (Cumene)	2.5	U	1.3	2.5	4.2
79-34-5	1,1,2,2-Tetrachloroethane	2.5	U	1.2	2.5	4.2
541-73-1	1,3-Dichlorobenzene	1.9	U	0.95	1.9	10.6
106-46-7	1,4-Dichlorobenzene	2.8	U	1.4	2.8	10.6
95-50-1	1,2-Dichlorobenzene	2.4	U	1.2	2.4	10.6
96-12-8	1,2-Dibromo-3-chloropropane	10.6	U	5.9	10.6	10.6
120-82-1	1,2,4-Trichlorobenzene	2.7	U	1.3	2.7	10.6
87-61-6	1,2,3-Trichlorobenzene	2.6	U	1.3	2.6	10.6
1330-20-7	Xylene (total)	2.9	U	1.4	2.9	8.5
1634-04-4	MTBE	1.8	U	0.91	1.8	4.2
76-13-1	1,1,2-Trichlorotrifluoroethane	2.7	U	1.3	2.7	4.2
110-82-7	Cyclohexane	4.2	U	2.1	4.2	4.2
79-20-9	Methyl Acetate	8.5	U	4.2	8.5	10.6
108-87-2	Methyl Cyclohexane	1.8	U	0.91	1.8	4.2

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304 Lab File ID: 1993-4.D

Sample wt/vol: 5.14 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1448

PercentSolids: 52.7 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	2.2	U	1.1	2.2	3.7
74-87-3	Chloromethane	1.4	U	0.7	1.4	3.7
75-01-4	Vinyl chloride	2.2	U	1.1	2.2	3.7
74-83-9	Bromomethane	3.7	U	2.2	3.7	3.7
75-00-3	Chloroethane	2.7	U	1.4	2.7	3.7
75-69-4	Trichlorofluoromethane	1.6	U	0.81	1.6	3.7
75-35-4	1,1-Dichloroethene	1.2	U	0.63	1.2	3.7
75-15-0	Carbon disulfide	4.4		2.8	3.7	3.7
75-09-2	Methylene chloride	4.4	U	2.2	4.4	9.2
156-60-5	trans-1,2-Dichloroethene	1.4	U	0.72	1.4	3.7
75-34-3	1,1-Dichloroethane	1.2	U	0.63	1.2	3.7
67-64-1	Acetone	62		2.4	4.8	18.4
156-59-2	cis-1,2-Dichloroethene	2.3	U	1.1	2.3	3.7
74-97-5	Bromochloromethane	3.3	U	1.7	3.3	3.7
78-93-3	2-Butanone	16.6	J	2.6	5.2	18.4
67-66-3	Chloroform	2	U	1	2	3.7
71-55-6	1,1,1-Trichloroethane	1.2	U	0.59	1.2	3.7
56-23-5	Carbon tetrachloride	2.2	U	1.1	2.2	3.7
71-43-2	Benzene	1.8	U	0.92	1.8	3.7
107-06-2	1,2-Dichloroethane	3.7	U	1.8	3.7	9.2
79-01-6	Trichloroethene	1.6	U	0.81	1.6	3.7
78-87-5	1,2-Dichloropropane	2.3	U	1.2	2.3	3.7
75-27-4	Bromodichloromethane	1.2	U	0.59	1.2	3.7
10061-01-5	cis-1,3-Dichloropropene	1.6	U	0.78	1.6	3.7
108-10-1	4-Methyl-2-pentanone	5.9	U	3	5.9	18.4
108-88-3	Toluene	1.1	U	0.54	1.1	3.7

exclude RE

160311 1923

Form I

VW 044411

022

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304 Lab File ID: 1993-4.D

Sample wt/vol: 5.14 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1448

PercentSolids: 52.7 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	3.7	U	1.8	3.7	3.7
79-00-5	1,1,2-Trichloroethane	3	U	1.5	3	3.7
127-18-4	Tetrachloroethene	3.9		1.7	3.4	3.7
591-78-6	2-Hexanone	4.8	U	2.4	4.8	18.4
124-48-1	Dibromochloromethane	1.7	U	0.85	1.7	3.7
106-93-4	1,2-Dibromoethane(EDB)	3	U	1.5	3	3.7
108-90-7	Chlorobenzene	1.3	U	0.65	1.3	3.7
100-41-4	Ethylbenzene	2.5	U	1.3	2.5	3.7
100-42-5	Styrene	1	U	0.52	1	3.7
75-25-2	Bromoform	1.7	U	0.85	1.7	3.7
98-82-8	Isopropylbenzene (Cumene)	2.2	U	1.1	2.2	3.7
79-34-5	1,1,2,2-Tetrachloroethane	2.2	U	1.1	2.2	3.7
541-73-1	1,3-Dichlorobenzene	1.7	U	0.83	1.7	9.2
106-46-7	1,4-Dichlorobenzene	2.4	U	1.2	2.4	9.2
95-50-1	1,2-Dichlorobenzene	2.1	U	1	2.1	9.2
96-12-8	1,2-Dibromo-3-chloropropane	9.2	U	5.2	9.2	9.2
120-82-1	1,2,4-Trichlorobenzene	2.3	U	1.2	2.3	9.2
87-61-6	1,2,3-Trichlorobenzene	2.2	U	1.1	2.2	9.2
1330-20-7	Xylene (total)	2.5	U	1.2	2.5	7.4
1634-04-4	MTBE	1.6	U	0.79	1.6	3.7
76-13-1	1,1,2-Trichlorotrifluoroethane	2.3	U	1.2	2.3	3.7
110-82-7	Cyclohexane	3.7	U	1.8	3.7	3.7
79-20-9	Methyl Acetate	7.4	U	3.7	7.4	9.2
108-87-2	Methyl Cyclohexane	1.6	U	0.79	1.6	3.7

exclude RE

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304RE1 Lab File ID: 1993-4.D

Sample wt/vol: 6.04 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1214

PercentSolids: 52.7 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	1.9 UJ SSL	U	0.94	1.9	3.1
74-87-3	Chloromethane	1.2	U	0.6	1.2	3.1
75-01-4	Vinyl chloride	1.9	U	0.94	1.9	3.1
74-83-9	Bromomethane	3.1	U	1.9	3.1	3.1
75-00-3	Chloroethane	2.3	U	1.2	2.3	3.1
75-69-4	Trichlorofluoromethane	1.4	U	0.69	1.4	3.1
75-35-4	1,1-Dichloroethene	1.1	U	0.53	1.1	3.1
75-15-0	Carbon disulfide	3.1	U	2.4	3.1	3.1
75-09-2	Methylene chloride	3.8	U	1.9	3.8	7.8
156-60-5	trans-1,2-Dichloroethene	1.2	U	0.61	1.2	3.1
75-34-3	1,1-Dichloroethane	1.1	U	0.53	1.1	3.1
67-64-1	Acetone	29.6 J		2	4.1	15.7
156-59-2	cis-1,2-Dichloroethene	1.9 UJ	U	0.97	1.9	3.1
74-97-5	Bromochloromethane	2.8	U	1.4	2.8	3.1
78-93-3	2-Butanone	4.4	U	2.2	4.4	15.7
67-66-3	Chloroform	1.7	U	0.85	1.7	3.1
71-55-6	1,1,1-Trichloroethane	1	U	0.5	1	3.1
56-23-5	Carbon tetrachloride	1.9	U	0.94	1.9	3.1
71-43-2	Benzene	1.6	U	0.78	1.6	3.1
107-06-2	1,2-Dichloroethane	3.1	U	1.6	3.1	7.8
79-01-6	Trichloroethene	1.4	U	0.69	1.4	3.1
78-87-5	1,2-Dichloropropane	2	U	0.99	2	3.1
75-27-4	Bromodichloromethane	1	U	0.5	1	3.1
10061-01-5	cis-1,3-Dichloropropene	1.3	U	0.66	1.3	3.1
108-10-1	4-Methyl-2-pentanone	5	U	2.5	5	15.7
108-88-3	Toluene	0.91	U	0.46	0.91	3.1

180311 1923

Form I

VW 04/4/11

024

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304RE1 Lab File ID: 1993-4.D

Sample wt/vol: 6.04 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1214

PercentSolids: 52.7 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	3.1 UJ SSL	U	1.6	3.1	3.1
79-00-5	1,1,2-Trichloroethane	2.6 UJ	U	1.3	2.6	3.1
127-18-4	Tetrachloroethene	2.2 J	J	1.5	2.9	3.1
591-78-6	2-Hexanone	4.1 UJ	U	2	4.1	15.7
124-48-1	Dibromochloromethane	1.4	U	0.72	1.4	3.1
106-93-4	1,2-Dibromoethane(EDB)	2.6	U	1.3	2.6	3.1
108-90-7	Chlorobenzene	1.1	U	0.55	1.1	3.1
100-41-4	Ethylbenzene	2.2	U	1.1	2.2	3.1
100-42-5	Styrene	0.88	U	0.44	0.88	3.1
75-25-2	Bromoform	1.4	U	0.72	1.4	3.1
98-82-8	Isopropylbenzene (Cumene)	1.9	U	0.94	1.9	3.1
79-34-5	1,1,2,2-Tetrachloroethane	1.8	U	0.93	1.8	3.1
541-73-1	1,3-Dichlorobenzene	1.4	U	0.71	1.4	7.8
106-46-7	1,4-Dichlorobenzene	2	U	1	2	7.8
95-50-1	1,2-Dichlorobenzene	1.8	U	0.88	1.8	7.8
96-12-8	1,2-Dibromo-3-chloropropane	7.8	U	4.4	7.8	7.8
120-82-1	1,2,4-Trichlorobenzene	2	U	0.99	2	7.8
87-61-6	1,2,3-Trichlorobenzene	1.9	U	0.96	1.9	7.8
1330-20-7	Xylene (total)	2.1	U	1.1	2.1	6.3
1634-04-4	MTBE	1.4	U	0.68	1.4	3.1
76-13-1	1,1,2-Trichlorotrifluoroethane	2	U	0.99	2	3.1
110-82-7	Cyclohexane	3.1	U	1.6	3.1	3.1
79-20-9	Methyl Acetate	6.3	U	3.1	6.3	7.8
108-87-2	Methyl Cyclohexane	1.4	U	0.68	1.4	3.1

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305 Lab File ID: 1993-5.D

Sample wt/vol: 5.33 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1514

PercentSolids: 60.7 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	1.8	U	0.93	1.8	3.1
74-87-3	Chloromethane	1.2	U	0.59	1.2	3.1
75-01-4	Vinyl chloride	1.8	U	0.93	1.8	3.1
74-83-9	Bromomethane	3.1	U	1.8	3.1	3.1
75-00-3	Chloroethane	2.3	U	1.1	2.3	3.1
75-69-4	Trichlorofluoromethane	1.4	U	0.68	1.4	3.1
75-35-4	1,1-Dichloroethene	1	U	0.52	1	3.1
75-15-0	Carbon disulfide	3.1	U	2.3	3.1	3.1
75-09-2	Methylene chloride	3.7	U	1.8	3.7	7.7
156-60-5	trans-1,2-Dichloroethene	1.2	U	0.6	1.2	3.1
75-34-3	1,1-Dichloroethane	1	U	0.52	1	3.1
67-64-1	Acetone	76		2	4	15.4
156-59-2	cis-1,2-Dichloroethene	1.9	U	0.96	1.9	3.1
74-97-5	Bromochloromethane	2.8	U	1.4	2.8	3.1
78-93-3	2-Butanone	20.7		2.2	4.3	15.4
67-66-3	Chloroform	1.7	U	0.83	1.7	3.1
71-55-6	1,1,1-Trichloroethane	0.99	U	0.49	0.99	3.1
56-23-5	Carbon tetrachloride	1.8	U	0.93	1.8	3.1
71-43-2	Benzene	1.5	U	0.77	1.5	3.1
107-06-2	1,2-Dichloroethane	3.1	U	1.5	3.1	7.7
79-01-6	Trichloroethene	1.4	U	0.68	1.4	3.1
78-87-5	1,2-Dichloropropane	1.9	U	0.97	1.9	3.1
75-27-4	Bromodichloromethane	0.99	U	0.49	0.99	3.1
10061-01-5	cis-1,3-Dichloropropene	1.3	U	0.65	1.3	3.1
108-10-1	4-Methyl-2-pentanone	4.9	U	2.5	4.9	15.4
108-88-3	Toluene	0.9	U	0.45	0.9	3.1

exclude PE

180311 1923

Form I

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305 Lab File ID: 1993-5.D

Sample wt/vol: 5.33 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1514

PercentSolids: 60.7 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	3.1	U	1.5	3.1	3.1
79-00-5	1,1,2-Trichloroethane	2.5	U	1.3	2.5	3.1
127-18-4	Tetrachloroethene	4.7		1.4	2.9	3.1
591-78-6	2-Hexanone	4	U	2	4	15.4
124-48-1	Dibromochloromethane	1.4	U	0.71	1.4	3.1
106-93-4	1,2-Dibromoethane(EDB)	2.5	U	1.3	2.5	3.1
108-90-7	Chlorobenzene	1.1	U	0.54	1.1	3.1
100-41-4	Ethylbenzene	2.1	U	1.1	2.1	3.1
100-42-5	Styrene	0.86	U	0.43	0.86	3.1
75-25-2	Bromoform	1.4	U	0.71	1.4	3.1
98-82-8	Isopropylbenzene (Cumene)	1.8	U	0.93	1.8	3.1
79-34-5	1,1,2,2-Tetrachloroethane	1.8	U	0.91	1.8	3.1
541-73-1	1,3-Dichlorobenzene	1.4	U	0.7	1.4	7.7
106-46-7	1,4-Dichlorobenzene	2	U	1	2	7.7
95-50-1	1,2-Dichlorobenzene	1.7	U	0.86	1.7	7.7
96-12-8	1,2-Dibromo-3-chloropropane	7.7	U	4.3	7.7	7.7
120-82-1	1,2,4-Trichlorobenzene	1.9	U	0.97	1.9	7.7
87-61-6	1,2,3-Trichlorobenzene	1.9	U	0.94	1.9	7.7
1330-20-7	Xylene (total)	2.1	U	1	2.1	6.2
1634-04-4	MTBE	1.3	U	0.66	1.3	3.1
76-13-1	1,1,2-Trichlorotrifluoroethane	1.9	U	0.97	1.9	3.1
110-82-7	Cyclohexane	3.1	U	1.5	3.1	3.1
79-20-9	Methyl Acetate	6.2	U	3.1	6.2	7.7
108-87-2	Methyl Cyclohexane	1.3	U	0.66	1.3	3.1

exclude RE

MM 041411

027

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD005-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305RE1 Lab File ID: 1993-5.D

Sample wt/vol: 5.43 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1508

PercentSolids: 60.7 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	1.8	U	0.91	1.8	3
74-87-3	Chloromethane	1.2	U	0.58	1.2	3
75-01-4	Vinyl chloride	1.8	U	0.91	1.8	3
74-83-9	Bromomethane	3	U	1.8	3	3
75-00-3	Chloroethane	2.2	U	1.1	2.2	3
75-69-4	Trichlorofluoromethane	1.3	U	0.67	1.3	3
75-35-4	1,1-Dichloroethene	1	U	0.52	1	3
75-15-0	Carbon disulfide	3	U	2.3	3	3
75-09-2	Methylene chloride	3.6	U	1.8	3.6	7.6
156-60-5	trans-1,2-Dichloroethene	1.2	U	0.59	1.2	3
75-34-3	1,1-Dichloroethane	1	U	0.52	1	3
67-64-1	Acetone	86.9		2	3.9	15.2
156-59-2	cis-1,2-Dichloroethene	1.9	U	0.94	1.9	3
74-97-5	Bromochloromethane	2.7	U	1.4	2.7	3
78-93-3	2-Butanone	19.5		2.1	4.2	15.2
67-66-3	Chloroform	1.6	U	0.82	1.6	3
71-55-6	1,1,1-Trichloroethane	0.97	U	0.48	0.97	3
56-23-5	Carbon tetrachloride	1.8	U	0.91	1.8	3
71-43-2	Benzene	1.5	U	0.76	1.5	3
107-06-2	1,2-Dichloroethane	3	U	1.5	3	7.6
79-01-6	Trichloroethene	1.3	U	0.67	1.3	3
78-87-5	1,2-Dichloropropane	1.9	U	0.96	1.9	3
75-27-4	Bromodichloromethane	0.97	U	0.48	0.97	3
10061-01-5	cis-1,3-Dichloropropene	1.3	U	0.64	1.3	3
108-10-1	4-Methyl-2-pentanone	4.8	U	2.4	4.8	15.2
108-88-3	Toluene	0.88	U	0.44	0.88	3

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD005-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305RE1 Lab File ID: 1993-5.D

Sample wt/vol: 5.43 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1508

PercentSolids: 60.7 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	3	U	1.5	3	3
79-00-5	1,1,2-Trichloroethane	2.5	U	1.2	2.5	3
127-18-4	Tetrachloroethene	1.8	J	1.4	2.8	3
591-78-6	2-Hexanone	3.9	U	2	3.9	15.2
124-48-1	Dibromochloromethane	1.4	U	0.7	1.4	3
106-93-4	1,2-Dibromoethane(EDB)	2.5	U	1.2	2.5	3
108-90-7	Chlorobenzene	1.1	U	0.53	1.1	3
100-41-4	Ethylbenzene	2.1	U	1	2.1	3
100-42-5	Styrene	0.85	U	0.42	0.85	3
75-25-2	Bromoform	1.4	U	0.7	1.4	3
98-82-8	Isopropylbenzene (Cumene)	1.8	U	0.91	1.8	3
79-34-5	1,1,2,2-Tetrachloroethane	1.8	U	0.9	1.8	3
541-73-1	1,3-Dichlorobenzene	1.4	U	0.68	1.4	7.6
106-46-7	1,4-Dichlorobenzene	2	U	0.99	2	7.6
95-50-1	1,2-Dichlorobenzene	1.7	U	0.85	1.7	7.6
96-12-8	1,2-Dibromo-3-chloropropane	7.6	U	4.2	7.6	7.6
120-82-1	1,2,4-Trichlorobenzene	1.9	U	0.96	1.9	7.6
87-61-6	1,2,3-Trichlorobenzene	1.8	U	0.92	1.8	7.6
1330-20-7	Xylene (total)	2.1	U	1	2.1	6.1
1634-04-4	MTBE	1.3	U	0.65	1.3	3
76-13-1	1,1,2-Trichlorotrifluoroethane	1.9	U	0.96	1.9	3
110-82-7	Cyclohexane	3	U	1.5	3	3
79-20-9	Methyl Acetate	6.1	U	3	6.1	7.6
108-87-2	Methyl Cyclohexane	1.3	U	0.65	1.3	3

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306 Lab File ID: 1993-6.D

Sample wt/vol: 3.83 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1554

PercentSolids: 59.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	2.6	U	1.3	2.6	4.4
74-87-3	Chloromethane	1.7	U	0.84	1.7	4.4
75-01-4	Vinyl chloride	2.6	U	1.3	2.6	4.4
74-83-9	Bromomethane	4.4	U	2.6	4.4	4.4
75-00-3	Chloroethane	3.3	U	1.6	3.3	4.4
75-69-4	Trichlorofluoromethane	1.9	U	0.97	1.9	4.4
75-35-4	1,1-Dichloroethene	1.5	U	0.75	1.5	4.4
75-15-0	Carbon disulfide	3.7	J	3.3	4.4	4.4
75-09-2	Methylene chloride	5.3	U	2.6	5.3	11
156-60-5	trans-1,2-Dichloroethene	1.7	U	0.86	1.7	4.4
75-34-3	1,1-Dichloroethane	1.5	U	0.75	1.5	4.4
67-64-1	Acetone	66		2.9	5.7	22.1
156-59-2	cis-1,2-Dichloroethene	2.7	U	1.4	2.7	4.4
74-97-5	Bromochloromethane	4	U	2	4	4.4
78-93-3	2-Butanone	14.3	J	3.1	6.2	22.1
67-66-3	Chloroform	2.4	U	1.2	2.4	4.4
71-55-6	1,1,1-Trichloroethane	1.4	U	0.71	1.4	4.4
56-23-5	Carbon tetrachloride	2.6	U	1.3	2.6	4.4
71-43-2	Benzene	2.2	U	1.1	2.2	4.4
107-06-2	1,2-Dichloroethane	4.4	U	2.2	4.4	11
79-01-6	Trichloroethene	1.9	U	0.97	1.9	4.4
78-87-5	1,2-Dichloropropane	2.8	U	1.4	2.8	4.4
75-27-4	Bromodichloromethane	1.4	U	0.71	1.4	4.4
10061-01-5	cis-1,3-Dichloropropene	1.8	U	0.93	1.8	4.4
108-10-1	4-Methyl-2-pentanone	7.1	U	3.5	7.1	22.1
108-88-3	Toluene	1.3	U	0.64	1.3	4.4

exclude RE

180311 1923

Form I

044411

030

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306 Lab File ID: 1993-6.D

Sample wt/vol: 3.83 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1554

PercentSolids: 59.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	4.4	U	2.2	4.4	4.4
79-00-5	1,1,2-Trichloroethane	3.6	U	1.8	3.6	4.4
127-18-4	Tetrachloroethene	5.6		2	4.1	4.4
591-78-6	2-Hexanone	5.7	U	2.9	5.7	22.1
124-48-1	Dibromochloromethane	2	U	1	2	4.4
106-93-4	1,2-Dibromoethane(EDB)	3.6	U	1.8	3.6	4.4
108-90-7	Chlorobenzene	1.5	U	0.77	1.5	4.4
100-41-4	Ethylbenzene	3	U	1.5	3	4.4
100-42-5	Styrene	1.2	U	0.62	1.2	4.4
75-25-2	Bromoform	2	U	1	2	4.4
98-82-8	Isopropylbenzene (Cumene)	2.6	U	1.3	2.6	4.4
79-34-5	1,1,2,2-Tetrachloroethane	2.6	U	1.3	2.6	4.4
541-73-1	1,3-Dichlorobenzene	2	U	0.99	2	11
106-46-7	1,4-Dichlorobenzene	2.9	U	1.4	2.9	11
95-50-1	1,2-Dichlorobenzene	2.5	U	1.2	2.5	11
96-12-8	1,2-Dibromo-3-chloropropane	11	U	6.2	11	11
120-82-1	1,2,4-Trichlorobenzene	2.8	U	1.4	2.8	11
87-61-6	1,2,3-Trichlorobenzene	2.7	U	1.3	2.7	11
1330-20-7	Xylene (total)	3	U	1.5	3	8.8
1634-04-4	MTBE	1.9	U	0.95	1.9	4.4
76-13-1	1,1,2-Trichlorotrifluoroethane	2.8	U	1.4	2.8	4.4
110-82-7	Cyclohexane	4.4	U	2.2	4.4	4.4
79-20-9	Methyl Acetate	8.8	U	4.4	8.8	11
108-87-2	Methyl Cyclohexane	1.9	U	0.95	1.9	4.4

exclude RE

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306RE1 Lab File ID: 1993-6.D

Sample wt/vol: 4.46 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1354

PercentSolids: 59.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	2.3 UJ SSL	U	1.1	2.3	3.8
74-87-3	Chloromethane	1.4 UJ	U	0.72	1.4	3.8
75-01-4	Vinyl chloride	2.3	U	1.1	2.3	3.8
74-83-9	Bromomethane	3.8	U	2.3	3.8	3.8
75-00-3	Chloroethane	2.8	U	1.4	2.8	3.8
75-69-4	Trichlorofluoromethane	1.7	U	0.83	1.7	3.8
75-35-4	1,1-Dichloroethene	1.3	U	0.64	1.3	3.8
75-15-0	Carbon disulfide	3.4 J	J	2.8	3.8	3.8
75-09-2	Methylene chloride	4.6 UJ	U	2.3	4.6	9.5
156-60-5	trans-1,2-Dichloroethene	1.5	U	0.74	1.5	3.8
75-34-3	1,1-Dichloroethane	1.3	U	0.64	1.3	3.8
67-64-1	Acetone	49.8 J		2.5	4.9	19
156-59-2	cis-1,2-Dichloroethene	2.4 UJ	U	1.2	2.4	3.8
74-97-5	Bromochloromethane	3.4 UJ	U	1.7	3.4	3.8
78-93-3	2-Butanone	13.4 J	J	2.6	5.3	19
67-66-3	Chloroform	2 UJ	U	1	2	3.8
71-55-6	1,1,1-Trichloroethane	1.2	U	0.61	1.2	3.8
56-23-5	Carbon tetrachloride	2.3	U	1.1	2.3	3.8
71-43-2	Benzene	1.9	U	0.95	1.9	3.8
107-06-2	1,2-Dichloroethane	3.8	U	1.9	3.8	9.5
79-01-6	Trichloroethene	1.7	U	0.83	1.7	3.8
78-87-5	1,2-Dichloropropane	2.4	U	1.2	2.4	3.8
75-27-4	Bromodichloromethane	1.2	U	0.61	1.2	3.8
10061-01-5	cis-1,3-Dichloropropene	1.6	U	0.8	1.6	3.8
108-10-1	4-Methyl-2-pentanone	6.1	U	3	6.1	19
108-88-3	Toluene	1.1	U	0.55	1.1	3.8

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306RE1 Lab File ID: 1993-6.D

Sample wt/vol: 4.46 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1354

PercentSolids: 59.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
10061-02-6	trans-1,3-Dichloropropene	3.8 UJ SSL	U	1.9	3.8	3.8
79-00-5	1,1,2-Trichloroethane	3.1 UJ	U	1.6	3.1	3.8
127-18-4	Tetrachloroethene	2.4 J	J	1.8	3.5	3.8
591-78-6	2-Hexanone	4.9 UJ	U	2.5	4.9	19
124-48-1	Dibromochloromethane	1.7	U	0.87	1.7	3.8
106-93-4	1,2-Dibromoethane(EDB)	3.1	U	1.6	3.1	3.8
108-90-7	Chlorobenzene	1.3	U	0.66	1.3	3.8
100-41-4	Ethylbenzene	2.6	U	1.3	2.6	3.8
100-42-5	Styrene	1.1	U	0.53	1.1	3.8
75-25-2	Bromoform	1.7	U	0.87	1.7	3.8
98-82-8	Isopropylbenzene (Cumene)	2.3	U	1.1	2.3	3.8
79-34-5	1,1,2,2-Tetrachloroethane	2.2	U	1.1	2.2	3.8
541-73-1	1,3-Dichlorobenzene	1.7	U	0.85	1.7	9.5
106-46-7	1,4-Dichlorobenzene	2.5	U	1.2	2.5	9.5
95-50-1	1,2-Dichlorobenzene	2.1	U	1.1	2.1	9.5
96-12-8	1,2-Dibromo-3-chloropropane	9.5	U	5.3	9.5	9.5
120-82-1	1,2,4-Trichlorobenzene	2.4	U	1.2	2.4	9.5
87-61-6	1,2,3-Trichlorobenzene	2.3	U	1.2	2.3	9.5
1330-20-7	Xylene (total)	2.6	U	1.3	2.6	7.6
1634-04-4	MTBE	1.6	U	0.82	1.6	3.8
76-13-1	1,1,2-Trichlorotrifluoroethane	2.4	U	1.2	2.4	3.8
110-82-7	Cyclohexane	3.8	U	1.9	3.8	3.8
79-20-9	Methyl Acetate	7.6	U	3.8	7.6	9.5
108-87-2	Methyl Cyclohexane	1.6	U	0.82	1.6	3.8

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307 Lab File ID: 1993-7.D

Sample wt/vol: 5.77 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1619

PercentSolids: 56.6 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	1.8	U	0.92	1.8	3.1
74-87-3	Chloromethane	1.2	U	0.58	1.2	3.1
75-01-4	Vinyl chloride	1.8	U	0.92	1.8	3.1
74-83-9	Bromomethane	3.1	U	1.8	3.1	3.1
75-00-3	Chloroethane	2.3	U	1.1	2.3	3.1
75-69-4	Trichlorofluoromethane	1.3	U	0.67	1.3	3.1
75-35-4	1,1-Dichloroethene	1	U	0.52	1	3.1
75-15-0	Carbon disulfide	2.5	J	2.3	3.1	3.1
75-09-2	Methylene chloride	3.7	U	1.8	3.7	7.6
156-60-5	trans-1,2-Dichloroethene	1.2	U	0.6	1.2	3.1
75-34-3	1,1-Dichloroethane	1	U	0.52	1	3.1
67-64-1	Acetone	4	U	2	4	15.3
156-59-2	cis-1,2-Dichloroethene	1.9	U	0.95	1.9	3.1
74-97-5	Bromochloromethane	2.8	U	1.4	2.8	3.1
78-93-3	2-Butanone	6.7	J	2.1	4.3	15.3
67-66-3	Chloroform	1.6	U	0.83	1.6	3.1
71-55-6	1,1,1-Trichloroethane	0.98	U	0.49	0.98	3.1
56-23-5	Carbon tetrachloride	1.8	U	0.92	1.8	3.1
71-43-2	Benzene	1.5	U	0.76	1.5	3.1
107-06-2	1,2-Dichloroethane	3.1	U	1.5	3.1	7.6
79-01-6	Trichloroethene	1.3	U	0.67	1.3	3.1
78-87-5	1,2-Dichloropropane	1.9	U	0.96	1.9	3.1
75-27-4	Bromodichloromethane	0.98	U	0.49	0.98	3.1
10061-01-5	cis-1,3-Dichloropropene	1.3	U	0.64	1.3	3.1
108-10-1	4-Methyl-2-pentanone	4.9	U	2.4	4.9	15.3
108-88-3	Toluene	0.89	U	0.44	0.89	3.1

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307 Lab File ID: 1993-7.D

Sample wt/vol: 5.77 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1619

PercentSolids: 56.6 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	3.1	U	1.5	3.1	3.1
79-00-5	1,1,2-Trichloroethane	2.5	U	1.2	2.5	3.1
127-18-4	Tetrachloroethene	4.3		1.4	2.8	3.1
591-78-6	2-Hexanone	4	U	2	4	15.3
124-48-1	Dibromochloromethane	1.4	U	0.7	1.4	3.1
106-93-4	1,2-Dibromoethane(EDB)	2.5	U	1.2	2.5	3.1
108-90-7	Chlorobenzene	1.1	U	0.54	1.1	3.1
100-41-4	Ethylbenzene	2.1	U	1	2.1	3.1
100-42-5	Styrene	0.86	U	0.43	0.86	3.1
75-25-2	Bromoform	1.4	U	0.7	1.4	3.1
98-82-8	Isopropylbenzene (Cumene)	1.8	U	0.92	1.8	3.1
79-34-5	1,1,2,2-Tetrachloroethane	1.8	U	0.9	1.8	3.1
541-73-1	1,3-Dichlorobenzene	1.4	U	0.69	1.4	7.6
106-46-7	1,4-Dichlorobenzene	2	U	1	2	7.6
95-50-1	1,2-Dichlorobenzene	1.7	U	0.86	1.7	7.6
96-12-8	1,2-Dibromo-3-chloropropane	7.6	U	4.3	7.6	7.6
120-82-1	1,2,4-Trichlorobenzene	1.9	U	0.96	1.9	7.6
87-61-6	1,2,3-Trichlorobenzene	1.9	U	0.93	1.9	7.6
1330-20-7	Xylene (total)	2.1	U	1	2.1	6.1
1634-04-4	MTBE	1.3	U	0.66	1.3	3.1
76-13-1	1,1,2-Trichlorotrifluoroethane	1.9	U	0.96	1.9	3.1
110-82-7	Cyclohexane	3.1	U	1.5	3.1	3.1
79-20-9	Methyl Acetate	6.1	U	3.1	6.1	7.6
108-87-2	Methyl Cyclohexane	1.3	U	0.66	1.3	3.1

exclude RE

180311 1923

Form I

VW 04411

035

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006P-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307RE1 Lab File ID: 1993-7.D

Sample wt/vol: 5.35 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1419

PercentSolids: 56.6 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	2	U	0.99	2	3.3
74-87-3	Chloromethane	1.2	U	0.63	1.2	3.3
75-01-4	Vinyl chloride	2	U	0.99	2	3.3
74-83-9	Bromomethane	3.3	U	2	3.3	3.3
75-00-3	Chloroethane	2.4	U	1.2	2.4	3.3
75-69-4	Trichlorofluoromethane	1.4	U	0.73	1.4	3.3
75-35-4	1,1-Dichloroethene	1.1	U	0.56	1.1	3.3
75-15-0	Carbon disulfide	3.3	U	2.5	3.3	3.3
75-09-2	Methylene chloride	4	U	2	4	8.2
156-60-5	trans-1,2-Dichloroethene	1.3	U	0.64	1.3	3.3
75-34-3	1,1-Dichloroethane	1.1	U	0.56	1.1	3.3
67-64-1	Acetone	4.3 UJ FD	U	2.1	4.3	16.5
156-59-2	cis-1,2-Dichloroethene	2	U	1	2	3.3
74-97-5	Bromochloromethane	3	U	1.5	3	3.3
78-93-3	2-Butanone	7.2 J SSH	U	2.3	4.6	16.5
67-66-3	Chloroform	1.8	U	0.89	1.8	3.3
71-55-6	1,1,1-Trichloroethane	1	U	0.53	1	3.3
56-23-5	Carbon tetrachloride	2	U	0.99	2	3.3
71-43-2	Benzene	1.6	U	0.82	1.6	3.3
107-06-2	1,2-Dichloroethane	3.3	U	1.6	3.3	8.2
79-01-6	Trichloroethene	1.4	U	0.73	1.4	3.3
78-87-5	1,2-Dichloropropane	2.1	U	1	2.1	3.3
75-27-4	Bromodichloromethane	1	U	0.53	1	3.3
10061-01-5	cis-1,3-Dichloropropene	1.4	U	0.69	1.4	3.3
108-10-1	4-Methyl-2-pentanone	5.3	U	2.6	5.3	16.5
108-88-3	Toluene	0.96	U	0.48	0.96	3.3

180311 1923

Form I

WW 041411

036

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006P-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307RE1 Lab File ID: 1993-7.D

Sample wt/vol: 5.35 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1419

PercentSolids: 56.6 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	3.3	U	1.6	3.3	3.3
79-00-5	1,1,2-Trichloroethane	2.7	U	1.4	2.7	3.3
127-18-4	Tetrachloroethene	3.1	U	1.5	3.1	3.3
591-78-6	2-Hexanone	4.3	U	2.1	4.3	16.5
124-48-1	Dibromochloromethane	1.5	U	0.76	1.5	3.3
106-93-4	1,2-Dibromoethane(EDB)	2.7	U	1.4	2.7	3.3
108-90-7	Chlorobenzene	1.2	U	0.58	1.2	3.3
100-41-4	Ethylbenzene	2.3	U	1.1	2.3	3.3
100-42-5	Styrene	0.92	U	0.46	0.92	3.3
75-25-2	Bromoform	1.5	U	0.76	1.5	3.3
98-82-8	Isopropylbenzene (Cumene)	2	U	0.99	2	3.3
79-34-5	1,1,2,2-Tetrachloroethane	1.9	U	0.97	1.9	3.3
541-73-1	1,3-Dichlorobenzene	1.5	U	0.74	1.5	8.2
106-46-7	1,4-Dichlorobenzene	2.1	U	1.1	2.1	8.2
95-50-1	1,2-Dichlorobenzene	1.8	U	0.92	1.8	8.2
96-12-8	1,2-Dibromo-3-chloropropane	8.2	U	4.6	8.2	8.2
120-82-1	1,2,4-Trichlorobenzene	2.1	U	1	2.1	8.2
87-61-6	1,2,3-Trichlorobenzene	2	U	1	2	8.2
1330-20-7	Xylene (total)	2.2	U	1.1	2.2	6.6
1634-04-4	MTBE	1.4	U	0.71	1.4	3.3
76-13-1	1,1,2-Trichlorotrifluoroethane	2.1	U	1	2.1	3.3
110-82-7	Cyclohexane	3.3	U	1.6	3.3	3.3
79-20-9	Methyl Acetate	6.6	U	3.3	6.6	8.2
108-87-2	Methyl Cyclohexane	1.4	U	0.71	1.4	3.3

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308 Lab File ID: 1993-8.D

Sample wt/vol: 5.29 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1644

PercentSolids: 50.8 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	2.2	U	1.1	2.2	3.7
74-87-3	Chloromethane	1.4	U	0.71	1.4	3.7
75-01-4	Vinyl chloride	2.2	U	1.1	2.2	3.7
74-83-9	Bromomethane	3.7	U	2.2	3.7	3.7
75-00-3	Chloroethane	2.8	U	1.4	2.8	3.7
75-69-4	Trichlorofluoromethane	1.6	U	0.82	1.6	3.7
75-35-4	1,1-Dichloroethene	1.3	U	0.63	1.3	3.7
75-15-0	Carbon disulfide	3.6	J	2.8	3.7	3.7
75-09-2	Methylene chloride	4.5	U	2.2	4.5	9.3
156-60-5	trans-1,2-Dichloroethene	1.4	U	0.72	1.4	3.7
75-34-3	1,1-Dichloroethane	1.3	U	0.63	1.3	3.7
67-64-1	Acetone	75.8		2.4	4.8	18.6
156-59-2	cis-1,2-Dichloroethene	2.3	U	1.2	2.3	3.7
74-97-5	Bromochloromethane	3.3	U	1.7	3.3	3.7
78-93-3	2-Butanone	5.2	U	2.6	5.2	18.6
67-66-3	Chloroform	2	U	1	2	3.7
71-55-6	1,1,1-Trichloroethane	1.2	U	0.6	1.2	3.7
56-23-5	Carbon tetrachloride	2.2	U	1.1	2.2	3.7
71-43-2	Benzene	1.9	U	0.93	1.9	3.7
107-06-2	1,2-Dichloroethane	3.7	U	1.9	3.7	9.3
79-01-6	Trichloroethene	1.6	U	0.82	1.6	3.7
78-87-5	1,2-Dichloropropane	2.3	U	1.2	2.3	3.7
75-27-4	Bromodichloromethane	1.2	U	0.6	1.2	3.7
10061-01-5	cis-1,3-Dichloropropene	1.6	U	0.78	1.6	3.7
108-10-1	4-Methyl-2-pentanone	6	U	3	6	18.6
108-88-3	Toluene	1.1	U	0.54	1.1	3.7

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308 Lab File ID: 1993-8.D

Sample wt/vol: 5.29 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1644

PercentSolids: 50.8 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	3.7	U	1.9	3.7	3.7
79-00-5	1,1,2-Trichloroethane	3	U	1.5	3	3.7
127-18-4	Tetrachloroethene	2.2	J	1.7	3.5	3.7
591-78-6	2-Hexanone	4.8	U	2.4	4.8	18.6
124-48-1	Dibromochloromethane	1.7	U	0.86	1.7	3.7
106-93-4	1,2-Dibromoethane(EDB)	3	U	1.5	3	3.7
108-90-7	Chlorobenzene	1.3	U	0.65	1.3	3.7
100-41-4	Ethylbenzene	2.6	U	1.3	2.6	3.7
100-42-5	Styrene	1	U	0.52	1	3.7
75-25-2	Bromoform	1.7	U	0.86	1.7	3.7
98-82-8	Isopropylbenzene (Cumene)	2.2	U	1.1	2.2	3.7
79-34-5	1,1,2,2-Tetrachloroethane	2.2	U	1.1	2.2	3.7
541-73-1	1,3-Dichlorobenzene	1.7	U	0.84	1.7	9.3
106-46-7	1,4-Dichlorobenzene	2.4	U	1.2	2.4	9.3
95-50-1	1,2-Dichlorobenzene	2.1	U	1	2.1	9.3
96-12-8	1,2-Dibromo-3-chloropropane	9.3	U	5.2	9.3	9.3
120-82-1	1,2,4-Trichlorobenzene	2.3	U	1.2	2.3	9.3
87-61-6	1,2,3-Trichlorobenzene	2.3	U	1.1	2.3	9.3
1330-20-7	Xylene (total)	2.5	U	1.3	2.5	7.4
1634-04-4	MTBE	1.6	U	0.8	1.6	3.7
76-13-1	1,1,2-Trichlorotrifluoroethane	2.3	U	1.2	2.3	3.7
110-82-7	Cyclohexane	3.7	U	1.9	3.7	3.7
79-20-9	Methyl Acetate	7.4	U	3.7	7.4	9.3
108-87-2	Methyl Cyclohexane	1.6	U	0.8	1.6	3.7

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD007-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308RE1 Lab File ID: 1993-8.D

Sample wt/vol: 4.44 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1443

PercentSolids: 50.8 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	2.7 UJ SSL	U	1.3	2.7	4.4
74-87-3	Chloromethane	1.7	U	0.84	1.7	4.4
75-01-4	Vinyl chloride	2.7	U	1.3	2.7	4.4
74-83-9	Bromomethane	4.4	U	2.7	4.4	4.4
75-00-3	Chloroethane	3.3	U	1.6	3.3	4.4
75-69-4	Trichlorofluoromethane	2	U	0.98	2	4.4
75-35-4	1,1-Dichloroethene	1.5	U	0.75	1.5	4.4
75-15-0	Carbon disulfide	4.4	U	3.3	4.4	4.4
75-09-2	Methylene chloride	5.3	U	2.7	5.3	11.1
156-60-5	trans-1,2-Dichloroethene	1.7	U	0.86	1.7	4.4
75-34-3	1,1-Dichloroethane	1.5	U	0.75	1.5	4.4
67-64-1	Acetone	112 J		2.9	5.8	22.2
156-59-2	cis-1,2-Dichloroethene	2.7 UJ	U	1.4	2.7	4.4
74-97-5	Bromochloromethane	4 UJ	U	2	4	4.4
78-93-3	2-Butanone	5.6 J	J	3.1	6.2	22.2
67-66-3	Chloroform	2.4 UJ	U	1.2	2.4	4.4
71-55-6	1,1,1-Trichloroethane	1.4	U	0.71	1.4	4.4
56-23-5	Carbon tetrachloride	2.7	U	1.3	2.7	4.4
71-43-2	Benzene	2.2	U	1.1	2.2	4.4
107-06-2	1,2-Dichloroethane	4.4	U	2.2	4.4	11.1
79-01-6	Trichloroethene	2	U	0.98	2	4.4
78-87-5	1,2-Dichloropropane	2.8	U	1.4	2.8	4.4
75-27-4	Bromodichloromethane	1.4	U	0.71	1.4	4.4
10061-01-5	cis-1,3-Dichloropropene	1.9	U	0.93	1.9	4.4
108-10-1	4-Methyl-2-pentanone	7.1	U	3.5	7.1	22.2
108-88-3	Toluene	1.3	U	0.64	1.3	4.4

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD007-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308RE1 Lab File ID: 1993-8.D

Sample wt/vol: 4.44 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1443

PercentSolids: 50.8 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
10061-02-6	trans-1,3-Dichloropropene	4.4 UJ SSL	U	2.2	4.4	4.4
79-00-5	1,1,2-Trichloroethane	3.6	U	1.8	3.6	4.4
127-18-4	Tetrachloroethene	4.1	U	2.1	4.1	4.4
591-78-6	2-Hexanone	5.8	U	2.9	5.8	22.2
124-48-1	Dibromochloromethane	2	U	1	2	4.4
106-93-4	1,2-Dibromoethane(EDB)	3.6	U	1.8	3.6	4.4
108-90-7	Chlorobenzene	1.6	U	0.78	1.6	4.4
100-41-4	Ethylbenzene	3	U	1.5	3	4.4
100-42-5	Styrene	1.2	U	0.62	1.2	4.4
75-25-2	Bromoform	2	U	1	2	4.4
98-82-8	Isopropylbenzene (Cumene)	2.7	U	1.3	2.7	4.4
79-34-5	1,1,2,2-Tetrachloroethane	2.6	U	1.3	2.6	4.4
541-73-1	1,3-Dichlorobenzene	2	U	1	2	11.1
106-46-7	1,4-Dichlorobenzene	2.9	U	1.4	2.9	11.1
95-50-1	1,2-Dichlorobenzene	2.5	U	1.2	2.5	11.1
96-12-8	1,2-Dibromo-3-chloropropane	11.1	U	6.2	11.1	11.1
120-82-1	1,2,4-Trichlorobenzene	2.8	U	1.4	2.8	11.1
87-61-6	1,2,3-Trichlorobenzene	2.7	U	1.4	2.7	11.1
1330-20-7	Xylene (total)	3	U	1.5	3	8.9
1634-04-4	MTBE	1.9	U	0.95	1.9	4.4
76-13-1	1,1,2-Trichlorotrifluoroethane	2.8	U	1.4	2.8	4.4
110-82-7	Cyclohexane	4.4	U	2.2	4.4	4.4
79-20-9	Methyl Acetate	8.9	U	4.4	8.9	11.1
108-87-2	Methyl Cyclohexane	1.9	U	0.95	1.9	4.4

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD008-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309 Lab File ID: 1993-9.D

Sample wt/vol: 6.11 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1709

PercentSolids: 78.6 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1.2	U	0.62	1.2	2.1
74-87-3	Chloromethane	0.79	U	0.4	0.79	2.1
75-01-4	Vinyl chloride	1.2	U	0.62	1.2	2.1
74-83-9	Bromomethane	2.1	U	1.2	2.1	2.1
75-00-3	Chloroethane	1.5	U	0.77	1.5	2.1
75-69-4	Trichlorofluoromethane	0.92	U	0.46	0.92	2.1
75-35-4	1,1-Dichloroethene	0.71	U	0.35	0.71	2.1
75-15-0	Carbon disulfide	2.1	U	1.6	2.1	2.1
75-09-2	Methylene chloride	2.5	U	1.2	2.5	5.2
156-60-5	trans-1,2-Dichloroethene	0.81	U	0.41	0.81	2.1
75-34-3	1,1-Dichloroethane	0.71	U	0.35	0.71	2.1
67-64-1	Acetone	2.7	U	1.4	2.7	10.4
156-59-2	cis-1,2-Dichloroethene	1.3	U	0.64	1.3	2.1
74-97-5	Bromochloromethane	1.9	U	0.94	1.9	2.1
78-93-3	2-Butanone	2.9	U	1.4	2.9	10.4
67-66-3	Chloroform	1.1	U	0.56	1.1	2.1
71-55-6	1,1,1-Trichloroethane	0.67	U	0.33	0.67	2.1
56-23-5	Carbon tetrachloride	1.2	U	0.62	1.2	2.1
71-43-2	Benzene	1	U	0.52	1	2.1
107-06-2	1,2-Dichloroethane	2.1	U	1	2.1	5.2
79-01-6	Trichloroethene	0.92	U	0.46	0.92	2.1
78-87-5	1,2-Dichloropropane	1.3	U	0.66	1.3	2.1
75-27-4	Bromodichloromethane	0.67	U	0.33	0.67	2.1
10061-01-5	cis-1,3-Dichloropropene	0.87	U	0.44	0.87	2.1
108-10-1	4-Methyl-2-pentanone	3.3	U	1.7	3.3	10.4
108-88-3	Toluene	0.6	U	0.3	0.6	2.1

exclude RE

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD008-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309 Lab File ID: 1993-9.D

Sample wt/vol: 6.11 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1709

PercentSolids: 78.6 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
10061-02-6	trans-1,3-Dichloropropene	2.1	U	1	2.1	2.1
79-00-5	1,1,2-Trichloroethane	1.7	U	0.85	1.7	2.1
127-18-4	Tetrachloroethene	3.4		0.97	1.9	2.1
591-78-6	2-Hexanone	2.7	U	1.4	2.7	10.4
124-48-1	Dibromochloromethane	0.96	U	0.48	0.96	2.1
106-93-4	1,2-Dibromoethane(EDB)	1.7	U	0.85	1.7	2.1
108-90-7	Chlorobenzene	0.73	U	0.36	0.73	2.1
100-41-4	Ethylbenzene	1.4	U	0.72	1.4	2.1
100-42-5	Styrene	0.58	U	0.29	0.58	2.1
75-25-2	Bromoform	0.96	U	0.48	0.96	2.1
98-82-8	Isopropylbenzene (Cumene)	1.2	U	0.62	1.2	2.1
79-34-5	1,1,2,2-Tetrachloroethane	1.2	U	0.61	1.2	2.1
541-73-1	1,3-Dichlorobenzene	0.94	U	0.47	0.94	5.2
106-46-7	1,4-Dichlorobenzene	1.4	U	0.68	1.4	5.2
95-50-1	1,2-Dichlorobenzene	1.2	U	0.58	1.2	5.2
96-12-8	1,2-Dibromo-3-chloropropane	5.2	U	2.9	5.2	5.2
120-82-1	1,2,4-Trichlorobenzene	1.3	U	0.66	1.3	5.2
87-61-6	1,2,3-Trichlorobenzene	1.3	U	0.64	1.3	5.2
1330-20-7	Xylene (total)	1.4	U	0.71	1.4	4.2
1634-04-4	MTBE	0.9	U	0.45	0.9	2.1
76-13-1	1,1,2-Trichlorotrifluoroethane	1.3	U	0.66	1.3	2.1
110-82-7	Cyclohexane	2.1	U	1	2.1	2.1
79-20-9	Methyl Acetate	4.2	U	2.1	4.2	5.2
108-87-2	Methyl Cyclohexane	0.9	U	0.45	0.9	2.1

exclude RE

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD008-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309RE1 Lab File ID: 1993-9.D

Sample wt/vol: 6.1 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1328

PercentSolids: 78.6 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1.2	U	0.62	1.2	2.1
74-87-3	Chloromethane	0.79	U	0.4	0.79	2.1
75-01-4	Vinyl chloride	1.2	U	0.62	1.2	2.1
74-83-9	Bromomethane	2.1	U	1.2	2.1	2.1
75-00-3	Chloroethane	1.5	U	0.77	1.5	2.1
75-69-4	Trichlorofluoromethane	0.92	U	0.46	0.92	2.1
75-35-4	1,1-Dichloroethene	0.71	U	0.35	0.71	2.1
75-15-0	Carbon disulfide	2.1	U	1.6	2.1	2.1
75-09-2	Methylene chloride	2.5	U	1.2	2.5	5.2
156-60-5	trans-1,2-Dichloroethene	0.81	U	0.41	0.81	2.1
75-34-3	1,1-Dichloroethane	0.71	U	0.35	0.71	2.1
67-64-1	Acetone	2.7	U	1.4	2.7	10.4
156-59-2	cis-1,2-Dichloroethene	1.3	U	0.65	1.3	2.1
74-97-5	Bromochloromethane	1.9	U	0.94	1.9	2.1
78-93-3	2-Butanone	2.9	U	1.4	2.9	10.4
67-66-3	Chloroform	1.1	U	0.56	1.1	2.1
71-55-6	1,1,1-Trichloroethane	0.67	U	0.33	0.67	2.1
56-23-5	Carbon tetrachloride	1.2	U	0.62	1.2	2.1
71-43-2	Benzene	1	U	0.52	1	2.1
107-06-2	1,2-Dichloroethane	2.1	U	1	2.1	5.2
79-01-6	Trichloroethene	0.92	U	0.46	0.92	2.1
78-87-5	1,2-Dichloropropane	1.3	U	0.66	1.3	2.1
75-27-4	Bromodichloromethane	0.67	U	0.33	0.67	2.1
10061-01-5	cis-1,3-Dichloropropene	0.88	U	0.44	0.88	2.1
108-10-1	4-Methyl-2-pentanone	3.3	U	1.7	3.3	10.4
108-88-3	Toluene	0.6	U	0.3	0.6	2.1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD008-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code: PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309RE1 Lab File ID: 1993-9.D

Sample wt/vol: 6.1 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1328

PercentSolids: 78.6 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	2.1	U	1	2.1	2.1
79-00-5	1,1,2-Trichloroethane	1.7	U	0.86	1.7	2.1
127-18-4	Tetrachloroethene	2	J	0.97	1.9	2.1
591-78-6	2-Hexanone	2.7	U	1.4	2.7	10.4
124-48-1	Dibromochloromethane	0.96	U	0.48	0.96	2.1
106-93-4	1,2-Dibromoethane(EDB)	1.7	U	0.86	1.7	2.1
108-90-7	Chlorobenzene	0.73	U	0.36	0.73	2.1
100-41-4	Ethylbenzene	1.4	U	0.72	1.4	2.1
100-42-5	Styrene	0.58	U	0.29	0.58	2.1
75-25-2	Bromoform	0.96	U	0.48	0.96	2.1
98-82-8	Isopropylbenzene (Cumene)	1.2	U	0.62	1.2	2.1
79-34-5	1,1,2,2-Tetrachloroethane	1.2	U	0.62	1.2	2.1
541-73-1	1,3-Dichlorobenzene	0.94	U	0.47	0.94	5.2
106-46-7	1,4-Dichlorobenzene	1.4	U	0.68	1.4	5.2
95-50-1	1,2-Dichlorobenzene	1.2	U	0.58	1.2	5.2
96-12-8	1,2-Dibromo-3-chloropropane	5.2	U	2.9	5.2	5.2
120-82-1	1,2,4-Trichlorobenzene	1.3	U	0.66	1.3	5.2
87-61-6	1,2,3-Trichlorobenzene	1.3	U	0.64	1.3	5.2
1330-20-7	Xylene (total)	1.4	U	0.71	1.4	4.2
1634-04-4	MTBE	0.9	U	0.45	0.9	2.1
76-13-1	1,1,2-Trichlorotrifluoroethane	1.3	U	0.66	1.3	2.1
110-82-7	Cyclohexane	2.1	U	1	2.1	2.1
79-20-9	Methyl Acetate	4.2	U	2.1	4.2	5.2
108-87-2	Methyl Cyclohexane	0.9	U	0.45	0.9	2.1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD009-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310 Lab File ID: 1993-10.D

Sample wt/vol: 4.44 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1734

PercentSolids: 32.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	4.2	U	2.1	4.2	7
74-87-3	Chloromethane	2.7	U	1.3	2.7	7
75-01-4	Vinyl chloride	4.2	U	2.1	4.2	7
74-83-9	Bromomethane	7	U	4.2	7	7
75-00-3	Chloroethane	5.2	U	2.6	5.2	7
75-69-4	Trichlorofluoromethane	3.1	U	1.5	3.1	7
75-35-4	1,1-Dichloroethene	2.4	U	1.2	2.4	7
75-15-0	Carbon disulfide	10.5		5.3	7	7
75-09-2	Methylene chloride	8.4	U	4.2	8.4	17.5
156-60-5	trans-1,2-Dichloroethene	2.7	U	1.4	2.7	7
75-34-3	1,1-Dichloroethane	2.4	U	1.2	2.4	7
67-64-1	Acetone	236		4.6	9.1	35.1
156-59-2	cis-1,2-Dichloroethene	4.4	U	2.2	4.4	7
74-97-5	Bromochloromethane	6.3	U	3.2	6.3	7
78-93-3	2-Butanone	52		4.9	9.8	35.1
67-66-3	Chloroform	3.8	U	1.9	3.8	7
71-55-6	1,1,1-Trichloroethane	2.2	U	1.1	2.2	7
56-23-5	Carbon tetrachloride	4.2	U	2.1	4.2	7
71-43-2	Benzene	3.5	U	1.8	3.5	7
107-06-2	1,2-Dichloroethane	7	U	3.5	7	17.5
79-01-6	Trichloroethene	3.1	U	1.5	3.1	7
78-87-5	1,2-Dichloropropane	4.4	U	2.2	4.4	7
75-27-4	Bromodichloromethane	2.2	U	1.1	2.2	7
10061-01-5	cis-1,3-Dichloropropene	2.9	U	1.5	2.9	7
108-10-1	4-Methyl-2-pentanone	11.2	U	5.6	11.2	35.1
108-88-3	Toluene	2	U	1	2	7

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD009-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310 Lab File ID: 1993-10.D

Sample wt/vol: 4.44 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1734

PercentSolids: 32.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	7	U	3.5	7	7
79-00-5	1,1,2-Trichloroethane	5.7	U	2.9	5.7	7
127-18-4	Tetrachloroethene	5.2	J	3.3	6.5	7
591-78-6	2-Hexanone	9.1	U	4.6	9.1	35.1
124-48-1	Dibromochloromethane	3.2	U	1.6	3.2	7
106-93-4	1,2-Dibromoethane(EDB)	5.7	U	2.9	5.7	7
108-90-7	Chlorobenzene	2.4	U	1.2	2.4	7
100-41-4	Ethylbenzene	4.8	U	2.4	4.8	7
100-42-5	Styrene	2	U	0.98	2	7
75-25-2	Bromoform	3.2	U	1.6	3.2	7
98-82-8	Isopropylbenzene (Cumene)	4.2	U	2.1	4.2	7
79-34-5	1,1,2,2-Tetrachloroethane	4.1	U	2.1	4.1	7
541-73-1	1,3-Dichlorobenzene	3.2	U	1.6	3.2	17.5
106-46-7	1,4-Dichlorobenzene	4.6	U	2.3	4.6	17.5
95-50-1	1,2-Dichlorobenzene	3.9	U	2	3.9	17.5
96-12-8	1,2-Dibromo-3-chloropropane	17.5	U	9.8	17.5	17.5
120-82-1	1,2,4-Trichlorobenzene	4.4	U	2.2	4.4	17.5
87-61-6	1,2,3-Trichlorobenzene	4.3	U	2.1	4.3	17.5
1330-20-7	Xylene (total)	4.8	U	2.4	4.8	14
1634-04-4	MTBE	3	U	1.5	3	7
76-13-1	1,1,2-Trichlorotrifluoroethane	4.4	U	2.2	4.4	7
110-82-7	Cyclohexane	7	U	3.5	7	7
79-20-9	Methyl Acetate	14	U	7	14	17.5
108-87-2	Methyl Cyclohexane	3	U	1.5	3	7

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD009-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310RE1 Lab File ID: 1993-10.D

Sample wt/vol: 4.45 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1600

PercentSolids: 32.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	4.2 UJ %SOL	U	2.1	4.2	7
74-87-3	Chloromethane	2.7	U	1.3	2.7	7
75-01-4	Vinyl chloride	4.2	U	2.1	4.2	7
74-83-9	Bromomethane	7	U	4.2	7	7
75-00-3	Chloroethane	5.2	U	2.6	5.2	7
75-69-4	Trichlorofluoromethane	3.1	U	1.5	3.1	7
75-35-4	1,1-Dichloroethene	2.4 J	U	1.2	2.4	7
75-15-0	Carbon disulfide	13 J		5.2	7	7
75-09-2	Methylene chloride	8.4 UJ	U	4.2	8.4	17.5
156-60-5	trans-1,2-Dichloroethene	2.7	U	1.4	2.7	7
75-34-3	1,1-Dichloroethane	2.4	U	1.2	2.4	7
67-64-1	Acetone	158 J		4.6	9.1	35
156-59-2	cis-1,2-Dichloroethene	4.3 UJ	U	2.2	4.3	7
74-97-5	Bromochloromethane	6.3 UJ	U	3.2	6.3	7
78-93-3	2-Butanone	47.3 J		4.9	9.8	35
67-66-3	Chloroform	3.8 UJ	U	1.9	3.8	7
71-55-6	1,1,1-Trichloroethane	2.2	U	1.1	2.2	7
56-23-5	Carbon tetrachloride	4.2	U	2.1	4.2	7
71-43-2	Benzene	3.5	U	1.8	3.5	7
107-06-2	1,2-Dichloroethane	7	U	3.5	7	17.5
79-01-6	Trichloroethene	3.1	U	1.5	3.1	7
78-87-5	1,2-Dichloropropane	4.4	U	2.2	4.4	7
75-27-4	Bromodichloromethane	2.2	U	1.1	2.2	7
10061-01-5	cis-1,3-Dichloropropene	2.9	U	1.5	2.9	7
108-10-1	4-Methyl-2-pentanone	11.2	U	5.6	11.2	35
108-88-3	Toluene	2	U	1	2	7

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD009-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310RE1 Lab File ID: 1993-10.D

Sample wt/vol: 4.45 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1600

PercentSolids: 32.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	7	UJ %SOL	3.5	7	7
79-00-5	1,1,2-Trichloroethane	5.7	U	2.9	5.7	7
127-18-4	Tetrachloroethene	6.5	U	3.2	6.5	7
591-78-6	2-Hexanone	9.1	U	4.6	9.1	35
124-48-1	Dibromochloromethane	3.2	U	1.6	3.2	7
106-93-4	1,2-Dibromoethane(EDB)	5.7	U	2.9	5.7	7
108-90-7	Chlorobenzene	2.4	U	1.2	2.4	7
100-41-4	Ethylbenzene	4.8	U	2.4	4.8	7
100-42-5	Styrene	2	U	0.98	2	7
75-25-2	Bromoform	3.2	U	1.6	3.2	7
98-82-8	Isopropylbenzene (Cumene)	4.2	U	2.1	4.2	7
79-34-5	1,1,2,2-Tetrachloroethane	4.1	U	2.1	4.1	7
541-73-1	1,3-Dichlorobenzene	3.2	U	1.6	3.2	17.5
106-46-7	1,4-Dichlorobenzene	4.6	U	2.3	4.6	17.5
95-50-1	1,2-Dichlorobenzene	3.9	U	2	3.9	17.5
96-12-8	1,2-Dibromo-3-chloropropane	17.5	U	9.8	17.5	17.5
120-82-1	1,2,4-Trichlorobenzene	4.4	U	2.2	4.4	17.5
87-61-6	1,2,3-Trichlorobenzene	4.3	U	2.1	4.3	17.5
1330-20-7	Xylene (total)	4.8	U	2.4	4.8	14
1634-04-4	MTBE	3	U	1.5	3	7
76-13-1	1,1,2-Trichlorotrifluoroethane	4.4	U	2.2	4.4	7
110-82-7	Cyclohexane	7	U	3.5	7	7
79-20-9	Methyl Acetate	14	U	7	14	17.5
108-87-2	Methyl Cyclohexane	3	U	1.5	3	7

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311 Lab File ID: 1993-11.D

Sample wt/vol: 5.77 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1759

PercentSolids: 61.4 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1.7	U	0.85	1.7	2.8
74-87-3	Chloromethane	1.1	U	0.54	1.1	2.8
75-01-4	Vinyl chloride	1.7	U	0.85	1.7	2.8
74-83-9	Bromomethane	2.8	U	1.7	2.8	2.8
75-00-3	Chloroethane	2.1	U	1	2.1	2.8
75-69-4	Trichlorofluoromethane	1.2	U	0.62	1.2	2.8
75-35-4	1,1-Dichloroethene	0.96	U	0.48	0.96	2.8
75-15-0	Carbon disulfide	2.8	U	2.1	2.8	2.8
75-09-2	Methylene chloride	3.4	U	1.7	3.4	7
156-60-5	trans-1,2-Dichloroethene	1.1	U	0.55	1.1	2.8
75-34-3	1,1-Dichloroethane	0.96	U	0.48	0.96	2.8
67-64-1	Acetone	3.7	U	1.8	3.7	14.1
156-59-2	cis-1,2-Dichloroethene	1.8	U	0.88	1.8	2.8
74-97-5	Bromochloromethane	2.5	U	1.3	2.5	2.8
78-93-3	2-Butanone	13.1	J	2	4	14.1
67-66-3	Chloroform	1.5	U	0.76	1.5	2.8
71-55-6	1,1,1-Trichloroethane	0.9	U	0.45	0.9	2.8
56-23-5	Carbon tetrachloride	1.7	U	0.85	1.7	2.8
71-43-2	Benzene	1.4	U	0.7	1.4	2.8
107-06-2	1,2-Dichloroethane	2.8	U	1.4	2.8	7
79-01-6	Trichloroethene	1.2	U	0.62	1.2	2.8
78-87-5	1,2-Dichloropropane	1.8	U	0.89	1.8	2.8
75-27-4	Bromodichloromethane	0.9	U	0.45	0.9	2.8
10061-01-5	cis-1,3-Dichloropropene	1.2	U	0.59	1.2	2.8
108-10-1	4-Methyl-2-pentanone	4.5	U	2.2	4.5	14.1
108-88-3	Toluene	0.82	U	0.41	0.82	2.8

exclude RE

190311 1923

Form I

VW 04141

050

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311 Lab File ID: 1993-11.D

Sample wt/vol: 5.77 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1759

PercentSolids: 61.4 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	2.8	U	1.4	2.8	2.8
79-00-5	1,1,2-Trichloroethane	2.3	U	1.2	2.3	2.8
127-18-4	Tetrachloroethene	4.2		1.3	2.6	2.8
591-78-6	2-Hexanone	3.7	U	1.8	3.7	14.1
124-48-1	Dibromochloromethane	1.3	U	0.65	1.3	2.8
106-93-4	1,2-Dibromoethane(EDB)	2.3	U	1.2	2.3	2.8
108-90-7	Chlorobenzene	0.99	U	0.49	0.99	2.8
100-41-4	Ethylbenzene	1.9	U	0.97	1.9	2.8
100-42-5	Styrene	0.79	U	0.4	0.79	2.8
75-25-2	Bromoform	1.3	U	0.65	1.3	2.8
98-82-8	Isopropylbenzene (Cumene)	1.7	U	0.85	1.7	2.8
79-34-5	1,1,2,2-Tetrachloroethane	1.7	U	0.83	1.7	2.8
541-73-1	1,3-Dichlorobenzene	1.3	U	0.64	1.3	7
106-46-7	1,4-Dichlorobenzene	1.8	U	0.92	1.8	7
95-50-1	1,2-Dichlorobenzene	1.6	U	0.79	1.6	7
96-12-8	1,2-Dibromo-3-chloropropane	7	U	4	7	7
120-82-1	1,2,4-Trichlorobenzene	1.8	U	0.89	1.8	7
87-61-6	1,2,3-Trichlorobenzene	1.7	U	0.86	1.7	7
1330-20-7	Xylene (total)	1.9	U	0.96	1.9	5.6
1634-04-4	MTBE	1.2	U	0.61	1.2	2.8
76-13-1	1,1,2-Trichlorotrifluoroethane	1.8	U	0.89	1.8	2.8
110-82-7	Cyclohexane	2.8	U	1.4	2.8	2.8
79-20-9	Methyl Acetate	5.6	U	2.8	5.6	7
108-87-2	Methyl Cyclohexane	1.2	U	0.61	1.2	2.8

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0010-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311RE1 Lab File ID: 1993-11.D

Sample wt/vol: 5.74 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1533

PercentSolids: 61.4 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	1.7	U	0.85	1.7	2.8
74-87-3	Chloromethane	1.1	U	0.54	1.1	2.8
75-01-4	Vinyl chloride	1.7	U	0.85	1.7	2.8
74-83-9	Bromomethane	2.8	U	1.7	2.8	2.8
75-00-3	Chloroethane	2.1	U	1	2.1	2.8
75-69-4	Trichlorofluoromethane	1.2	U	0.62	1.2	2.8
75-35-4	1,1-Dichloroethene	0.96	U	0.48	0.96	2.8
75-15-0	Carbon disulfide	2.8	U	2.1	2.8	2.8
75-09-2	Methylene chloride	3.4	U	1.7	3.4	7.1
156-60-5	trans-1,2-Dichloroethene	1.1	U	0.55	1.1	2.8
75-34-3	1,1-Dichloroethane	0.96	U	0.48	0.96	2.8
67-64-1	Acetone	70		1.8	3.7	14.2
156-59-2	cis-1,2-Dichloroethene	1.8	U	0.88	1.8	2.8
74-97-5	Bromochloromethane	2.6	U	1.3	2.6	2.8
78-93-3	2-Butanone	13.9	J	2	4	14.2
67-66-3	Chloroform	1.5	U	0.77	1.5	2.8
71-55-6	1,1,1-Trichloroethane	0.91	U	0.45	0.91	2.8
56-23-5	Carbon tetrachloride	1.7	U	0.85	1.7	2.8
71-43-2	Benzene	1.4	U	0.71	1.4	2.8
107-06-2	1,2-Dichloroethane	2.8	U	1.4	2.8	7.1
79-01-6	Trichloroethene	1.2	U	0.62	1.2	2.8
78-87-5	1,2-Dichloropropane	1.8	U	0.89	1.8	2.8
75-27-4	Bromodichloromethane	0.91	U	0.45	0.91	2.8
10061-01-5	cis-1,3-Dichloropropene	1.2	U	0.6	1.2	2.8
108-10-1	4-Methyl-2-pentanone	4.5	U	2.3	4.5	14.2
108-88-3	Toluene	0.82	U	0.41	0.82	2.8

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0010-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311RE1 Lab File ID: 1993-11.D

Sample wt/vol: 5.74 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1533

PercentSolids: 61.4 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	2.8	U	1.4	2.8	2.8
79-00-5	1,1,2-Trichloroethane	2.3	U	1.2	2.3	2.8
127-18-4	Tetrachloroethene	1.6	J	1.3	2.6	2.8
591-78-6	2-Hexanone	3.7	U	1.8	3.7	14.2
124-48-1	Dibromochloromethane	1.3	U	0.65	1.3	2.8
106-93-4	1,2-Dibromoethane(EDB)	2.3	U	1.2	2.3	2.8
108-90-7	Chlorobenzene	0.99	U	0.5	0.99	2.8
100-41-4	Ethylbenzene	2	U	0.98	2	2.8
100-42-5	Styrene	0.79	U	0.4	0.79	2.8
75-25-2	Bromoform	1.3	U	0.65	1.3	2.8
98-82-8	Isopropylbenzene (Cumene)	1.7	U	0.85	1.7	2.8
79-34-5	1,1,2,2-Tetrachloroethane	1.7	U	0.84	1.7	2.8
541-73-1	1,3-Dichlorobenzene	1.3	U	0.64	1.3	7.1
106-46-7	1,4-Dichlorobenzene	1.8	U	0.92	1.8	7.1
95-50-1	1,2-Dichlorobenzene	1.6	U	0.79	1.6	7.1
96-12-8	1,2-Dibromo-3-chloropropane	7.1	U	4	7.1	7.1
120-82-1	1,2,4-Trichlorobenzene	1.8	U	0.89	1.8	7.1
87-61-6	1,2,3-Trichlorobenzene	1.7	U	0.86	1.7	7.1
1330-20-7	Xylene (total)	1.9	U	0.96	1.9	5.7
1634-04-4	MTBE	1.2	U	0.61	1.2	2.8
76-13-1	1,1,2-Trichlorotrifluoroethane	1.8	U	0.89	1.8	2.8
110-82-7	Cyclohexane	2.8	U	1.4	2.8	2.8
79-20-9	Methyl Acetate	5.7	U	2.8	5.7	7.1
108-87-2	Methyl Cyclohexane	1.2	U	0.61	1.2	2.8

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312 Lab File ID: 1993-12.D

Sample wt/vol: 3.93 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1824

PercentSolids: 91.9 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	1.7	U	0.83	1.7	2.8
74-87-3	Chloromethane	1	U	0.53	1	2.8
75-01-4	Vinyl chloride	1.7	U	0.83	1.7	2.8
74-83-9	Bromomethane	2.8	U	1.7	2.8	2.8
75-00-3	Chloroethane	2	U	1	2	2.8
75-69-4	Trichlorofluoromethane	1.2	U	0.61	1.2	2.8
75-35-4	1,1-Dichloroethene	0.94	U	0.47	0.94	2.8
75-15-0	Carbon disulfide	2.8	U	2.1	2.8	2.8
75-09-2	Methylene chloride	3.3	U	1.7	3.3	6.9
156-60-5	trans-1,2-Dichloroethene	1.1	U	0.54	1.1	2.8
75-34-3	1,1-Dichloroethane	0.94	U	0.47	0.94	2.8
67-64-1	Acetone	3.6	U	1.8	3.6	13.8
156-59-2	cis-1,2-Dichloroethene	1.7	U	0.86	1.7	2.8
74-97-5	Bromochloromethane	2.5	U	1.2	2.5	2.8
78-93-3	2-Butanone	3.9	U	1.9	3.9	13.8
67-66-3	Chloroform	1.5	U	0.75	1.5	2.8
71-55-6	1,1,1-Trichloroethane	0.89	U	0.44	0.89	2.8
56-23-5	Carbon tetrachloride	1.7	U	0.83	1.7	2.8
71-43-2	Benzene	1.4	U	0.69	1.4	2.8
107-06-2	1,2-Dichloroethane	2.8	U	1.4	2.8	6.9
79-01-6	Trichloroethene	1.2	U	0.61	1.2	2.8
78-87-5	1,2-Dichloropropane	1.7	U	0.87	1.7	2.8
75-27-4	Bromodichloromethane	0.89	U	0.44	0.89	2.8
10061-01-5	cis-1,3-Dichloropropene	1.2	U	0.58	1.2	2.8
108-10-1	4-Methyl-2-pentanone	4.4	U	2.2	4.4	13.8
108-88-3	Toluene	0.8	U	0.4	0.8	2.8

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312 Lab File ID: 1993-12.D

Sample wt/vol: 3.93 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1824

PercentSolids: 91.9 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	2.8	U	1.4	2.8	2.8
79-00-5	1,1,2-Trichloroethane	2.3	U	1.1	2.3	2.8
127-18-4	Tetrachloroethene	2.7	J	1.3	2.6	2.8
591-78-6	2-Hexanone	3.6	U	1.8	3.6	13.8
124-48-1	Dibromochloromethane	1.3	U	0.64	1.3	2.8
106-93-4	1,2-Dibromoethane(EDB)	2.3	U	1.1	2.3	2.8
108-90-7	Chlorobenzene	0.97	U	0.48	0.97	2.8
100-41-4	Ethylbenzene	1.9	U	0.96	1.9	2.8
100-42-5	Styrene	0.78	U	0.39	0.78	2.8
75-25-2	Bromoform	1.3	U	0.64	1.3	2.8
98-82-8	Isopropylbenzene (Cumene)	1.7	U	0.83	1.7	2.8
79-34-5	1,1,2,2-Tetrachloroethane	1.6	U	0.82	1.6	2.8
541-73-1	1,3-Dichlorobenzene	1.2	U	0.62	1.2	6.9
106-46-7	1,4-Dichlorobenzene	1.8	U	0.9	1.8	6.9
95-50-1	1,2-Dichlorobenzene	1.6	U	0.78	1.6	6.9
96-12-8	1,2-Dibromo-3-chloropropane	6.9	U	3.9	6.9	6.9
120-82-1	1,2,4-Trichlorobenzene	1.7	U	0.87	1.7	6.9
87-61-6	1,2,3-Trichlorobenzene	1.7	U	0.84	1.7	6.9
1330-20-7	Xylene (total)	1.9	U	0.94	1.9	5.5
1634-04-4	MTBE	1.2	U	0.6	1.2	2.8
76-13-1	1,1,2-Trichlorotrifluoroethane	1.7	U	0.87	1.7	2.8
110-82-7	Cyclohexane	2.8	U	1.4	2.8	2.8
79-20-9	Methyl Acetate	5.5	U	2.8	5.5	6.9
108-87-2	Methyl Cyclohexane	1.2	U	0.6	1.2	2.8

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code: PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312RE1 Lab File ID: 1993-12.D

Sample wt/vol: 5.85 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1238

PercentSolids: 91.9 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1.1 UJ SSL	U	0.56	1.1	1.9
74-87-3	Chloromethane	0.71	U	0.35	0.71	1.9
75-01-4	Vinyl chloride	1.1	U	0.56	1.1	1.9
74-83-9	Bromomethane	1.9	U	1.1	1.9	1.9
75-00-3	Chloroethane	1.4	U	0.69	1.4	1.9
75-69-4	Trichlorofluoromethane	0.82	U	0.41	0.82	1.9
75-35-4	1,1-Dichloroethene	0.63	U	0.32	0.63	1.9
75-15-0	Carbon disulfide	1.9	U	1.4	1.9	1.9
75-09-2	Methylene chloride	2.2	U	1.1	2.2	4.6
156-60-5	trans-1,2-Dichloroethene	0.72	U	0.36	0.72	1.9
75-34-3	1,1-Dichloroethane	0.63	U	0.32	0.63	1.9
67-64-1	Acetone	4.6 J	J	1.2	2.4	9.3
156-59-2	cis-1,2-Dichloroethene	1.2 UJ	U	0.58	1.2	1.9
74-97-5	Bromochloromethane	1.7	U	0.84	1.7	1.9
78-93-3	2-Butanone	2.6	U	1.3	2.6	9.3
67-66-3	Chloroform	1	U	0.5	1	1.9
71-55-6	1,1,1-Trichloroethane	0.6	U	0.3	0.6	1.9
56-23-5	Carbon tetrachloride	1.1	U	0.56	1.1	1.9
71-43-2	Benzene	0.93	U	0.46	0.93	1.9
107-06-2	1,2-Dichloroethane	1.9	U	0.93	1.9	4.6
79-01-6	Trichloroethene	0.82	U	0.41	0.82	1.9
78-87-5	1,2-Dichloropropane	1.2	U	0.58	1.2	1.9
75-27-4	Bromodichloromethane	0.6	U	0.3	0.6	1.9
10061-01-5	cis-1,3-Dichloropropene	0.78	U	0.39	0.78	1.9
108-10-1	4-Methyl-2-pentanone	3	U	1.5	3	9.3
108-88-3	Toluene	0.54	U	0.27	0.54	1.9

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312RE1 Lab File ID: 1993-12.D

Sample wt/vol: 5.85 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1238

PercentSolids: 91.9 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	1.9 UJ SSV	U	0.93	1.9	1.9
79-00-5	1,1,2-Trichloroethane	1.5	U	0.76	1.5	1.9
127-18-4	Tetrachloroethene	1.7	U	0.86	1.7	1.9
591-78-6	2-Hexanone	2.4	U	1.2	2.4	9.3
124-48-1	Dibromochloromethane	0.86	U	0.43	0.86	1.9
106-93-4	1,2-Dibromoethane(EDB)	1.5	U	0.76	1.5	1.9
108-90-7	Chlorobenzene	0.65	U	0.32	0.65	1.9
100-41-4	Ethylbenzene	1.3	U	0.64	1.3	1.9
100-42-5	Styrene	0.52	U	0.26	0.52	1.9
75-25-2	Bromoform	0.86	U	0.43	0.86	1.9
98-82-8	Isopropylbenzene (Cumene)	1.1	U	0.56	1.1	1.9
79-34-5	1,1,2,2-Tetrachloroethane	1.1	U	0.55	1.1	1.9
541-73-1	1,3-Dichlorobenzene	0.84	U	0.42	0.84	4.6
106-46-7	1,4-Dichlorobenzene	1.2	U	0.6	1.2	4.6
95-50-1	1,2-Dichlorobenzene	1	U	0.52	1	4.6
96-12-8	1,2-Dibromo-3-chloropropane	4.6	U	2.6	4.6	4.6
120-82-1	1,2,4-Trichlorobenzene	1.2	U	0.58	1.2	4.6
87-61-6	1,2,3-Trichlorobenzene	1.1	U	0.57	1.1	4.6
1330-20-7	Xylene (total)	1.3	U	0.63	1.3	3.7
1634-04-4	MTBE	0.8	U	0.4	0.8	1.9
76-13-1	1,1,2-Trichlorotrifluoroethane	1.2	U	0.58	1.2	1.9
110-82-7	Cyclohexane	1.9	U	0.93	1.9	1.9
79-20-9	Methyl Acetate	3.7	U	1.9	3.7	4.6
108-87-2	Methyl Cyclohexane	0.8	U	0.4	0.8	1.9

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313 Lab File ID: 1993-13.D

Sample wt/vol: 5.72 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1849

PercentSolids: 92 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1.1	U	0.57	1.1	1.9
74-87-3	Chloromethane	0.72	U	0.36	0.72	1.9
75-01-4	Vinyl chloride	1.1	U	0.57	1.1	1.9
74-83-9	Bromomethane	1.9	U	1.1	1.9	1.9
75-00-3	Chloroethane	1.4	U	0.7	1.4	1.9
75-69-4	Trichlorofluoromethane	0.84	U	0.42	0.84	1.9
75-35-4	1,1-Dichloroethene	0.65	U	0.32	0.65	1.9
75-15-0	Carbon disulfide	1.9	U	1.4	1.9	1.9
75-09-2	Methylene chloride	2.3	U	1.1	2.3	4.8
156-60-5	trans-1,2-Dichloroethene	0.74	U	0.37	0.74	1.9
75-34-3	1,1-Dichloroethane	0.65	U	0.32	0.65	1.9
67-64-1	Acetone	2.5	U	1.2	2.5	9.5
156-59-2	cis-1,2-Dichloroethene	1.2	U	0.59	1.2	1.9
74-97-5	Bromochloromethane	1.7	U	0.86	1.7	1.9
78-93-3	2-Butanone	2.7	U	1.3	2.7	9.5
67-66-3	Chloroform	1	U	0.51	1	1.9
71-55-6	1,1,1-Trichloroethane	0.61	U	0.3	0.61	1.9
56-23-5	Carbon tetrachloride	1.1	U	0.57	1.1	1.9
71-43-2	Benzene	0.95	U	0.48	0.95	1.9
107-06-2	1,2-Dichloroethane	1.9	U	0.95	1.9	4.8
79-01-6	Trichloroethene	0.84	U	0.42	0.84	1.9
78-87-5	1,2-Dichloropropane	1.2	U	0.6	1.2	1.9
75-27-4	Bromodichloromethane	0.61	U	0.3	0.61	1.9
10061-01-5	cis-1,3-Dichloropropene	0.8	U	0.4	0.8	1.9
108-10-1	4-Methyl-2-pentanone	3	U	1.5	3	9.5
108-88-3	Toluene	0.55	U	0.28	0.55	1.9

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313 Lab File ID: 1993-13.D

Sample wt/vol: 5.72 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1849

PercentSolids: 92 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
10061-02-6	trans-1,3-Dichloropropene	1.9	U	0.95	1.9	1.9
79-00-5	1,1,2-Trichloroethane	1.6	U	0.78	1.6	1.9
127-18-4	Tetrachloroethene	2.6		0.88	1.8	1.9
591-78-6	2-Hexanone	2.5	U	1.2	2.5	9.5
124-48-1	Dibromochloromethane	0.87	U	0.44	0.87	1.9
106-93-4	1,2-Dibromoethane(EDB)	1.6	U	0.78	1.6	1.9
108-90-7	Chlorobenzene	0.66	U	0.33	0.66	1.9
100-41-4	Ethylbenzene	1.3	U	0.66	1.3	1.9
100-42-5	Styrene	0.28	J	0.27	0.53	1.9
75-25-2	Bromoform	0.87	U	0.44	0.87	1.9
98-82-8	Isopropylbenzene (Cumene)	1.1	U	0.57	1.1	1.9
79-34-5	1,1,2,2-Tetrachloroethane	1.1	U	0.56	1.1	1.9
541-73-1	1,3-Dichlorobenzene	0.86	U	0.43	0.86	4.8
106-46-7	1,4-Dichlorobenzene	1.2	U	0.62	1.2	4.8
95-50-1	1,2-Dichlorobenzene	1.1	U	0.53	1.1	4.8
96-12-8	1,2-Dibromo-3-chloropropane	4.8	U	2.7	4.8	4.8
120-82-1	1,2,4-Trichlorobenzene	1.2	U	0.6	1.2	4.8
87-61-6	1,2,3-Trichlorobenzene	1.2	U	0.58	1.2	4.8
1330-20-7	Xylene (total)	1.3	U	0.65	1.3	3.8
1634-04-4	MTBE	0.82	U	0.41	0.82	1.9
76-13-1	1,1,2-Trichlorotrifluoroethane	1.2	U	0.6	1.2	1.9
110-82-7	Cyclohexane	1.9	U	0.95	1.9	1.9
79-20-9	Methyl Acetate	3.8	U	1.9	3.8	4.8
108-87-2	Methyl Cyclohexane	0.82	U	0.41	0.82	1.9

exclude RE

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011P-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313RE1 Lab File ID: 1993-13.D

Sample wt/vol: 5.64 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1303

PercentSolids: 92 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	1.2	U	0.58	1.2	1.9
74-87-3	Chloromethane	0.73	U	0.37	0.73	1.9
75-01-4	Vinyl chloride	1.2	U	0.58	1.2	1.9
74-83-9	Bromomethane	1.9	U	1.2	1.9	1.9
75-00-3	Chloroethane	1.4	U	0.71	1.4	1.9
75-69-4	Trichlorofluoromethane	0.85	U	0.42	0.85	1.9
75-35-4	1,1-Dichloroethene	0.66	U	0.33	0.66	1.9
75-15-0	Carbon disulfide	1.9	U	1.4	1.9	1.9
75-09-2	Methylene chloride	2.3	U	1.2	2.3	4.8
156-60-5	trans-1,2-Dichloroethene	0.75	U	0.38	0.75	1.9
75-34-3	1,1-Dichloroethane	0.66	U	0.33	0.66	1.9
67-64-1	Acetone	2.5	U	1.2	2.5	9.6
156-59-2	cis-1,2-Dichloroethene	1.2	U	0.6	1.2	1.9
74-97-5	Bromochloromethane	1.7	U	0.87	1.7	1.9
78-93-3	2-Butanone	2.7	U	1.3	2.7	9.6
67-66-3	Chloroform	1	U	0.52	1	1.9
71-55-6	1,1,1-Trichloroethane	0.62	U	0.31	0.62	1.9
56-23-5	Carbon tetrachloride	1.2	U	0.58	1.2	1.9
71-43-2	Benzene	0.96	U	0.48	0.96	1.9
107-06-2	1,2-Dichloroethane	1.9	U	0.96	1.9	4.8
79-01-6	Trichloroethene	0.85	U	0.42	0.85	1.9
78-87-5	1,2-Dichloropropane	1.2	U	0.61	1.2	1.9
75-27-4	Bromodichloromethane	0.62	U	0.31	0.62	1.9
10061-01-5	cis-1,3-Dichloropropene	0.81	U	0.4	0.81	1.9
108-10-1	4-Methyl-2-pentanone	3.1	U	1.5	3.1	9.6
108-88-3	Toluene	0.56	U	0.28	0.56	1.9

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011P-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313RE1 Lab File ID: 1993-13.D

Sample wt/vol: 5.64 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1303

PercentSolids: 92 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	1.9	U	0.96	1.9	1.9
79-00-5	1,1,2-Trichloroethane	1.6	U	0.79	1.6	1.9
127-18-4	Tetrachloroethene	2	J FD	0.9	1.8	1.9
591-78-6	2-Hexanone	2.5	U	1.2	2.5	9.6
124-48-1	Dibromochloromethane	0.89	U	0.44	0.89	1.9
106-93-4	1,2-Dibromoethane(EDB)	1.6	U	0.79	1.6	1.9
108-90-7	Chlorobenzene	0.67	U	0.34	0.67	1.9
100-41-4	Ethylbenzene	1.3	U	0.66	1.3	1.9
100-42-5	Styrene	0.54	U	0.27	0.54	1.9
75-25-2	Bromoform	0.89	U	0.44	0.89	1.9
98-82-8	Isopropylbenzene (Cumene)	1.2	U	0.58	1.2	1.9
79-34-5	1,1,2,2-Tetrachloroethane	1.1	U	0.57	1.1	1.9
541-73-1	1,3-Dichlorobenzene	0.87	U	0.43	0.87	4.8
106-46-7	1,4-Dichlorobenzene	1.2	U	0.63	1.2	4.8
95-50-1	1,2-Dichlorobenzene	1.1	U	0.54	1.1	4.8
96-12-8	1,2-Dibromo-3-chloropropane	4.8	U	2.7	4.8	4.8
120-82-1	1,2,4-Trichlorobenzene	1.2	U	0.61	1.2	4.8
87-61-6	1,2,3-Trichlorobenzene	1.2	U	0.59	1.2	4.8
1330-20-7	Xylene (total)	1.3	U	0.66	1.3	3.8
1634-04-4	MTBE	0.83	U	0.41	0.83	1.9
76-13-1	1,1,2-Trichlorotrifluoroethane	1.2	U	0.61	1.2	1.9
110-82-7	Cyclohexane	1.9	U	0.96	1.9	1.9
79-20-9	Methyl Acetate	3.8	U	1.9	3.8	4.8
108-87-2	Methyl Cyclohexane	0.83	U	0.41	0.83	1.9

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020411

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199314 Lab File ID: 99314.D

Sample wt/vol: 5 Units: ML Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1253

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020411

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199314 Lab File ID: 99314.D

Sample wt/vol: 5 Units: ML Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1253

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-020411

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199315 Lab File ID: 99315.D

Sample wt/vol: 5 Units: ML Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1315

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	0.87	J	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-020411

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199315 Lab File ID: 99315.D

Sample wt/vol: 5 Units: ML Date Received: 02/07/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1315

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301 Lab File ID: 99301.D

Sample wt/vol: 25.01 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0217

PercentSolids: 52 decanted : Dilution Factor: 5

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	20.4 UJ BSL	~~U~~	10.2	20.4	25.6
91-57-6	2-Methylnaphthalene	20.4	U	10.2	20.4	25.6
83-32-9	Acenaphthene	20.4	U	10.2	20.4	25.6
208-96-8	Acenaphthylene	20.4	U	10.2	20.4	25.6
120-12-7	Anthracene	20.4	U	10.2	20.4	25.6
56-55-3	Benzo(a)anthracene	39.7		10.8	21.5	25.6
50-32-8	Benzo(a)pyrene	77.8 J MSL		13.8	25.6	25.6
205-99-2	Benzo(b)fluoranthene	124 J		14.6	25.6	25.6
191-24-2	Benzo(g,h,i)perylene	60 J		23.8	25.6	25.6
207-08-9	Benzo(k)fluoranthene	39.8 J		16.1	25.6	25.6
218-01-9	Chrysene	49.5		10	20	25.6
53-70-3	Dibenzo(a,h)anthracene	25.6	U	20	25.6	25.6
206-44-0	Fluoranthene	49 J MSL		10.2	20.4	25.6
86-73-7	Fluorene	20.4	U	10.2	20.4	25.6
193-39-5	Indeno(1,2,3-cd)pyrene	50.5 J MSL		23.1	25.6	25.6
91-20-3	Naphthalene	20.4	U	10.2	20.4	25.6
85-01-8	Phenanthrene	27		10.2	20.4	25.6
129-00-0	Pyrene	67.4		10.2	20.4	25.6

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code: PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304 Lab File ID: 99304.D

Sample wt/vol: 25.79 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0344

PercentSolids: 52.7 decanted : Dilution Factor: 5

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	19.6	UJ BSL U	9.8	19.6	24.5
91-57-6	2-Methylnaphthalene	19.6	U	9.8	19.6	24.5
83-32-9	Acenaphthene	11.9	J	9.8	19.6	24.5
208-96-8	Acenaphthylene	19.6	U	9.8	19.6	24.5
120-12-7	Anthracene	28.2		9.8	19.6	24.5
56-55-3	Benzo(a)anthracene	66.7		10.3	20.6	24.5
50-32-8	Benzo(a)pyrene	65.1		13.2	24.5	24.5
205-99-2	Benzo(b)fluoranthene	87.4		14	24.5	24.5
191-24-2	Benzo(g,h,i)perylene	38.8		22.8	24.5	24.5
207-08-9	Benzo(k)fluoranthene	31.5		15.4	24.5	24.5
218-01-9	Chrysene	63.1		9.6	19.1	24.5
53-70-3	Dibenzo(a,h)anthracene	24.5	U	19.1	24.5	24.5
206-44-0	Fluoranthene	91.7		9.8	19.6	24.5
86-73-7	Fluorene	11.6	J	9.8	19.6	24.5
193-39-5	Indeno(1,2,3-cd)pyrene	34.9		22.1	24.5	24.5
91-20-3	Naphthalene	19.6	U	9.8	19.6	24.5
85-01-8	Phenanthrene	111		9.8	19.6	24.5
129-00-0	Pyrene	125		9.8	19.6	24.5

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305 Lab File ID: 99305.D

Sample wt/vol: 25.79 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0413

PercentSolids: 60.7 decanted : Dilution Factor: 5

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	17 UJ DT	U	8.5	17	21.3
91-57-6	2-Methylnaphthalene	17	U	8.5	17	21.3
83-32-9	Acenaphthene	17	U	8.5	17	21.3
208-96-8	Acenaphthylene	17	U	8.5	17	21.3
120-12-7	Anthracene	17	U	8.5	17	21.3
56-55-3	Benzo(a)anthracene	22.6 J		8.9	17.9	21.3
50-32-8	Benzo(a)pyrene	24.5		11.5	21.3	21.3
205-99-2	Benzo(b)fluoranthene	40.5		12.1	21.3	21.3
191-24-2	Benzo(g,h,i)perylene	21.3 UJ	U	19.8	21.3	21.3
207-08-9	Benzo(k)fluoranthene	16.2 J	J	13.4	21.3	21.3
218-01-9	Chrysene	21.1	J	8.3	16.6	21.3
53-70-3	Dibenzo(a,h)anthracene	21.3 UJ	U	16.6	21.3	21.3
206-44-0	Fluoranthene	29.5 J		8.5	17	21.3
86-73-7	Fluorene	17 UJ	U	8.5	17	21.3
193-39-5	Indeno(1,2,3-cd)pyrene	21.3	U	19.2	21.3	21.3
91-20-3	Naphthalene	17	U	8.5	17	21.3
85-01-8	Phenanthrene	9.1 J	J	8.5	17	21.3
129-00-0	Pyrene	31.9 J		8.5	17	21.3

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306 Lab File ID: 99306.D

Sample wt/vol: 25.01 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0442

PercentSolids: 59.1 decanted : Dilution Factor: 5

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	18 UJ OT	U	9	18	22.5
91-57-6	2-Methylnaphthalene	18	U	9	18	22.5
83-32-9	Acenaphthene	18	U	9	18	22.5
208-96-8	Acenaphthylene	18	U	9	18	22.5
120-12-7	Anthracene	9.4 J	J	9	18	22.5
56-55-3	Benzo(a)anthracene	59.9		9.5	18.9	22.5
50-32-8	Benzo(a)pyrene	62.5		12.2	22.5	22.5
205-99-2	Benzo(b)fluoranthene	96.1		12.8	22.5	22.5
191-24-2	Benzo(g,h,i)perylene	32.1		21	22.5	22.5
207-08-9	Benzo(k)fluoranthene	37.8		14.2	22.5	22.5
218-01-9	Chrysene	54.1		8.8	17.6	22.5
53-70-3	Dibenzo(a,h)anthracene	22.5 UJ	U	17.6	22.5	22.5
206-44-0	Fluoranthene	72.9 J		9	18	22.5
86-73-7	Fluorene	18 UJ	U	9	18	22.5
193-39-5	Indeno(1,2,3-cd)pyrene	33.7 J		20.3	22.5	22.5
91-20-3	Naphthalene	18 UJ	U	9	18	22.5
85-01-8	Phenanthrene	9.8 J	J	9	18	22.5
129-00-0	Pyrene	63.6 J		9	18	22.5

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307 Lab File ID: 99307.D

Sample wt/vol: 25.79 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0511

PercentSolids: 56.6 decanted : Dilution Factor: 10

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	36.4 UJ OT	U	18.2	36.4	45.6
91-57-6	2-Methylnaphthalene	36.4	U	18.2	36.4	45.6
83-32-9	Acenaphthene	36.4	U	18.2	36.4	45.6
208-96-8	Acenaphthylene	20 J	J	18.2	36.4	45.6
120-12-7	Anthracene	18.8	J	18.2	36.4	45.6
56-55-3	Benzo(a)anthracene	102		19.2	38.4	45.6
50-32-8	Benzo(a)pyrene	110		24.7	45.6	45.6
205-99-2	Benzo(b)fluoranthene	160		26	45.6	45.6
191-24-2	Benzo(g,h,i)perylene	62.2		42.5	45.6	45.6
207-08-9	Benzo(k)fluoranthene	63.4		28.8	45.6	45.6
218-01-9	Chrysene	92.4		17.8	35.6	45.6
53-70-3	Dibenzo(a,h)anthracene	45.6 UJ	U	35.6	45.6	45.6
206-44-0	Fluoranthene	122		18.2	36.4	45.6
86-73-7	Fluorene	36.4 UJ	U	18.2	36.4	45.6
193-39-5	Indeno(1,2,3-cd)pyrene	61.4		41.1	45.6	45.6
91-20-3	Naphthalene	36.4 UJ	U	18.2	36.4	45.6
85-01-8	Phenanthrene	36.4 UJ	U	18.2	36.4	45.6
129-00-0	Pyrene	106		18.2	36.4	45.6

1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308 Lab File ID: 99308.D

Sample wt/vol: 25.76 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0540

PercentSolids: 50.8 decanted : Dilution Factor: 1

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
90-12-0	1-Methylnaphthalene	4.1 UJ DT	U	2	4.1	5.1
91-57-6	2-Methylnaphthalene	4.1	U	2	4.1	5.1
83-32-9	Acenaphthene	4.1	U	2	4.1	5.1
208-96-8	Acenaphthylene	4.1	U	2	4.1	5.1
120-12-7	Anthracene	4.1	U	2	4.1	5.1
56-55-3	Benzo(a)anthracene	4.7 J	J	2.1	4.3	5.1
50-32-8	Benzo(a)pyrene	6.7		2.8	5.1	5.1
205-99-2	Benzo(b)fluoranthene	10.7		2.9	5.1	5.1
191-24-2	Benzo(g,h,i)perylene	5.1 UJ	U	4.7	5.1	5.1
207-08-9	Benzo(k)fluoranthene	4.2 J	J	3.2	5.1	5.1
218-01-9	Chrysene	6.8 J		2	4	5.1
53-70-3	Dibenzo(a,h)anthracene	5.1 UJ	U	4	5.1	5.1
206-44-0	Fluoranthene	8.5 J		2	4.1	5.1
86-73-7	Fluorene	4.1 UJ	U	2	4.1	5.1
193-39-5	Indeno(1,2,3-cd)pyrene	5.1	U	4.6	5.1	5.1
91-20-3	Naphthalene	4.1	U	2	4.1	5.1
85-01-8	Phenanthrene	4.1	U	2	4.1	5.1
129-00-0	Pyrene	7.3 J		2	4.1	5.1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD008-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309 Lab File ID: 99309.D

Sample wt/vol: 25.99 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0609

PercentSolids: 78.6 decanted : Dilution Factor: 1

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
90-12-0	1-Methylnaphthalene	2.6 UJ OT	U	1.3	2.6	3.3
91-57-6	2-Methylnaphthalene	2.6	U	1.3	2.6	3.3
83-32-9	Acenaphthene	2.6	U	1.3	2.6	3.3
208-96-8	Acenaphthylene	2.6	U	1.3	2.6	3.3
120-12-7	Anthracene	2.6	U	1.3	2.6	3.3
56-55-3	Benzo(a)anthracene	2.7	U	1.4	2.7	3.3
50-32-8	Benzo(a)pyrene	3.3	U	1.8	3.3	3.3
205-99-2	Benzo(b)fluoranthene	3.3	U	1.9	3.3	3.3
191-24-2	Benzo(g,h,i)perylene	3.3	U	3	3.3	3.3
207-08-9	Benzo(k)fluoranthene	3.3	U	2	3.3	3.3
218-01-9	Chrysene	2.5	U	1.3	2.5	3.3
53-70-3	Dibenzo(a,h)anthracene	3.3	U	2.5	3.3	3.3
206-44-0	Fluoranthene	2.6	U	1.3	2.6	3.3
86-73-7	Fluorene	2.6	U	1.3	2.6	3.3
193-39-5	Indeno(1,2,3-cd)pyrene	3.3	U	2.9	3.3	3.3
91-20-3	Naphthalene	2.6	U	1.3	2.6	3.3
85-01-8	Phenanthrene	2.6	U	1.3	2.6	3.3
129-00-0	Pyrene	2.6	U	1.3	2.6	3.3

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD009-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310 Lab File ID: 99310.D

Sample wt/vol: 25.01 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0638

PercentSolids: 32.1 decanted : Dilution Factor: 5

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	33.1 UJ OT	U	16.6	33.1	41.5
91-57-6	2-Methylnaphthalene	33.1	U	16.6	33.1	41.5
83-32-9	Acenaphthene	33.1	U	16.6	33.1	41.5
208-96-8	Acenaphthylene	33.1	U	16.6	33.1	41.5
120-12-7	Anthracene	33.1	U	16.6	33.1	41.5
56-55-3	Benzo(a)anthracene	63.2 J		17.4	34.9	41.5
50-32-8	Benzo(a)pyrene	96.7		22.4	41.5	41.5
205-99-2	Benzo(b)fluoranthene	155		23.7	41.5	41.5
191-24-2	Benzo(g,h,i)perylene	58.8		38.6	41.5	41.5
207-08-9	Benzo(k)fluoranthene	59.7		26.2	41.5	41.5
218-01-9	Chrysene	86.3		16.2	32.4	41.5
53-70-3	Dibenzo(a,h)anthracene	41.5 UJ	U	32.4	41.5	41.5
206-44-0	Fluoranthene	92.6 J		16.6	33.1	41.5
86-73-7	Fluorene	33.1 UJ	U	16.6	33.1	41.5
193-39-5	Indeno(1,2,3-cd)pyrene	55.5 J		37.4	41.5	41.5
91-20-3	Naphthalene	33.1 UJ	U	16.6	33.1	41.5
85-01-8	Phenanthrene	26 J	J	16.6	33.1	41.5
129-00-0	Pyrene	108 J		16.6	33.1	41.5

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311 Lab File ID: 99311.D

Sample wt/vol: 25.41 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0707

PercentSolids: 61.4 decanted : Dilution Factor: 5

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	17 UJ OT	U	8.5	17	21.3
91-57-6	2-Methylnaphthalene	17	U	8.5	17	21.3
83-32-9	Acenaphthene	17	U	8.5	17	21.3
208-96-8	Acenaphthylene	17	U	8.5	17	21.3
120-12-7	Anthracene	17	U	8.5	17	21.3
56-55-3	Benzo(a)anthracene	20.2 J	J	9	17.9	21.3
50-32-8	Benzo(a)pyrene	25.2		11.5	21.3	21.3
205-99-2	Benzo(b)fluoranthene	36.1		12.2	21.3	21.3
191-24-2	Benzo(g,h,i)perylene	21.3 UJ	U	19.9	21.3	21.3
207-08-9	Benzo(k)fluoranthene	15.1 J	J	13.4	21.3	21.3
218-01-9	Chrysene	18.2 J	J	8.3	16.7	21.3
53-70-3	Dibenzo(a,h)anthracene	21.3 UJ	U	16.7	21.3	21.3
206-44-0	Fluoranthene	25.2		8.5	17	21.3
86-73-7	Fluorene	17 UJ	U	8.5	17	21.3
193-39-5	Indeno(1,2,3-cd)pyrene	21.3	U	19.2	21.3	21.3
91-20-3	Naphthalene	17	U	8.5	17	21.3
85-01-8	Phenanthrene	8.7 J	J	8.5	17	21.3
129-00-0	Pyrene	32.8 J		8.5	17	21.3

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312 Lab File ID: 99312.D

Sample wt/vol: 25.01 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0736

PercentSolids: 91.9 decanted : Dilution Factor: 5

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	11.6 UJ QT	U	5.8	11.6	14.5
91-57-6	2-Methylnaphthalene	11.6	U	5.8	11.6	14.5
83-32-9	Acenaphthene	11.6	U	5.8	11.6	14.5
208-96-8	Acenaphthylene	11.6	U	5.8	11.6	14.5
120-12-7	Anthracene	11.6	U	5.8	11.6	14.5
56-55-3	Benzo(a)anthracene	30.6 J		6.1	12.2	14.5
50-32-8	Benzo(a)pyrene	29.1		7.8	14.5	14.5
205-99-2	Benzo(b)fluoranthene	41.2		8.3	14.5	14.5
191-24-2	Benzo(g,h,i)perylene	17.2		13.5	14.5	14.5
207-08-9	Benzo(k)fluoranthene	15.2		9.1	14.5	14.5
218-01-9	Chrysene	26.5		5.6	11.3	14.5
53-70-3	Dibenzo(a,h)anthracene	14.5 UJ	U	11.3	14.5	14.5
206-44-0	Fluoranthene	43.6 J		5.8	11.6	14.5
86-73-7	Fluorene	11.6 UJ	U	5.8	11.6	14.5
193-39-5	Indeno(1,2,3-cd)pyrene	16.8 J		13	14.5	14.5
91-20-3	Naphthalene	11.6 UJ	U	5.8	11.6	14.5
85-01-8	Phenanthrene	17.5 J		5.8	11.6	14.5
129-00-0	Pyrene	38.8 J		5.8	11.6	14.5

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313 Lab File ID: 99313.D

Sample wt/vol: 25.51 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 03/10/11 Time: 0805

PercentSolids: 92 decanted : Dilution Factor: 5

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	11.3 UJ OT	U	5.7	11.3	14.2
91-57-6	2-Methylnaphthalene	11.3	U	5.7	11.3	14.2
83-32-9	Acenaphthene	11.3	U	5.7	11.3	14.2
208-96-8	Acenaphthylene	11.3	U	5.7	11.3	14.2
120-12-7	Anthracene	11.3	U	5.7	11.3	14.2
56-55-3	Benzo(a)anthracene	12.3 J	J	6	11.9	14.2
50-32-8	Benzo(a)pyrene	20.4		7.7	14.2	14.2
205-99-2	Benzo(b)fluoranthene	29.7		8.1	14.2	14.2
191-24-2	Benzo(g,h,i)perylene	13.6	J	13.2	14.2	14.2
207-08-9	Benzo(k)fluoranthene	11.7	J	8.9	14.2	14.2
218-01-9	Chrysene	16.3		5.5	11.1	14.2
53-70-3	Dibenzo(a,h)anthracene	14.2 UJ	U	11.1	14.2	14.2
206-44-0	Fluoranthene	13.9 J	J	5.7	11.3	14.2
86-73-7	Fluorene	11.3 UJ	U	5.7	11.3	14.2
193-39-5	Indeno(1,2,3-cd)pyrene	13.3 J	J	12.8	14.2	14.2
91-20-3	Naphthalene	11.3 UJ	U	5.7	11.3	14.2
85-01-8	Phenanthrene	11.3 UJ	U	5.7	11.3	14.2
129-00-0	Pyrene	13.4 J	J	5.7	11.3	14.2

1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020411

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199314 Lab File ID: 99314.D

Sample wt/vol: 960 Units: ML Date Received: 02/07/11

Concentrated Extract Volume: 1 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1416

PercentSolids: 0 decanted : (Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	0.042	U	0.021	0.042	0.052
91-57-6	2-Methylnaphthalene	0.042	U	0.021	0.042	0.052
83-32-9	Acenaphthene	0.042	U	0.021	0.042	0.052
208-96-8	Acenaphthylene	0.042	U	0.021	0.042	0.052
120-12-7	Anthracene	0.042	U	0.021	0.042	0.052
56-55-3	Benzo(a)anthracene	0.042	U	0.021	0.042	0.052
50-32-8	Benzo(a)pyrene	0.042	U	0.021	0.042	0.052
205-99-2	Benzo(b)fluoranthene	0.042	U	0.021	0.042	0.052
191-24-2	Benzo(g,h,i)perylene	0.042	U	0.021	0.042	0.052
207-08-9	Benzo(k)fluoranthene	0.042	U	0.021	0.042	0.052
218-01-9	Chrysene	0.042	U	0.021	0.042	0.052
53-70-3	Dibenz(a,h)anthracene	0.042	U	0.021	0.042	0.052
206-44-0	Fluoranthene	0.042	U	0.021	0.042	0.052
86-73-7	Fluorene	0.042	U	0.021	0.042	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	U	0.021	0.042	0.052
91-20-3	Naphthalene	0.042	U	0.021	0.042	0.052
85-01-8	Phenanthrene	0.042	U	0.021	0.042	0.052
129-00-0	Pyrene	0.042	U	0.021	0.042	0.052

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301 Lab File ID: 93-01D2.D

Sample wt/vol: 25.02 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1158

PercentSolids: 52 decanted : Dilution Factor: 2

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	4.6	U	3	4.6	4.6
319-85-7	beta-BHC	0.92	U	0.46	0.92	4.6
319-86-8	delta-BHC	1.7	UJ MSL ~~U~~	0.86	1.7	4.6
58-89-9	gamma-BHC (Lindane)	1.2	U	0.61	1.2	4.6
76-44-8	Heptachlor	1.2	U	0.61	1.2	4.6
309-00-2	Aldrin	0.92	UJ MSL ~~U~~	0.46	0.92	4.6
1024-57-3	Heptachlor epoxide	0.92	UJ MSL ~~U~~	0.46	0.92	4.6
959-98-8	Endosulfan I	1.4	U	0.68	1.4	4.6
60-57-1	Dieldrin	0.98	U	0.49	0.98	4.6
72-55-9	4,4'-DDE	94	J SSH	0.83	1.7	4.6
72-20-8	Endrin	1.6	U	0.8	1.6	4.6
33213-65-9	Endosulfan II	1.8	U	0.89	1.8	4.6
72-54-8	4,4'-DDD	59	J SSH	1.6	3.1	4.6
1031-07-8	Endosulfan sulfate	1.2	U	0.61	1.2	4.6
50-29-3	4,4'-DDT	3.2	J SSH ~~JP~~	1.2	2.3	4.6
72-43-5	Methoxychlor	1.7	U	0.83	1.7	4.6
7421-93-4	Endrin aldehyde	2.2	U	1.1	2.2	4.6
5103-74-2	gamma-Chlordane	1	U	0.52	1	4.6
5103-71-9	alpha-Chlordane	0.98	UJ MSL ~~U~~	0.49	0.98	4.6
53494-70-5	Endrin ketone	1.3	U	0.64	1.3	4.6
8001-35-2	Toxaphene	150	U	100	150	150

Results reported on Primary Column, if RPD >40% results flagged accordingly.

JMC 4/12/11

180311 1924

Form I

U76

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304 Lab File ID: 93-04D2.D

Sample wt/vol: 25.43 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1252

PercentSolids: 52.7 decanted : Dilution Factor: 2

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	4.5	U	2.9	4.5	4.5
319-85-7	beta-BHC	0.9	U	0.45	0.9	4.5
319-86-8	delta-BHC	1.7	U	0.84	1.7	4.5
58-89-9	gamma-BHC (Lindane)	1.2	U	0.6	1.2	4.5
76-44-8	Heptachlor	1.2	U	0.6	1.2	4.5
309-00-2	Aldrin	0.9	U	0.45	0.9	4.5
1024-57-3	Heptachlor epoxide	0.9	U	0.45	0.9	4.5
959-98-8	Endosulfan I	1.3	U	0.66	1.3	4.5
60-57-1	Dieldrin	0.96	U	0.48	0.96	4.5
72-55-9	4,4'-DDE	28 J SSH		0.8	1.6	4.5
72-20-8	Endrin	1.6	U	0.78	1.6	4.5
33213-65-9	Endosulfan II	1.7	U	0.86	1.7	4.5
72-54-8	4,4'-DDD	14 J SSH		1.5	3	4.5
1031-07-8	Endosulfan sulfate	1.2	U	0.6	1.2	4.5
50-29-3	4,4'-DDT	2.3	U	1.1	2.3	4.5
72-43-5	Methoxychlor	1.6	U	0.8	1.6	4.5
7421-93-4	Endrin aldehyde	2.1	U	1.1	2.1	4.5
5103-74-2	gamma-Chlordane	1	U	0.51	1	4.5
5103-71-9	alpha-Chlordane	0.96	U	0.48	0.96	4.5
53494-70-5	Endrin ketone	1.2	U	0.63	1.2	4.5
8001-35-2	Toxaphene	150	U	99	150	150

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305 Lab File ID: 93-05D2.D

Sample wt/vol: 25.55 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1854

PercentSolids: 60.7 decanted : Dilution Factor: 2

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	3.9	UJ	2.5	3.9	3.9
319-85-7	beta-BHC	0.77	U	0.39	0.77	3.9
319-86-8	delta-BHC	1.4	U	0.72	1.4	3.9
58-89-9	gamma-BHC (Lindane)	1	U	0.52	1	3.9
76-44-8	Heptachlor	1	U	0.52	1	3.9
309-00-2	Aldrin	0.77	U	0.39	0.77	3.9
1024-57-3	Heptachlor epoxide	0.77	U	0.39	0.77	3.9
959-98-8	Endosulfan I	1.1	U	0.57	1.1	3.9
60-57-1	Dieldrin	0.82	U	0.41	0.82	3.9
72-55-9	4,4'-DDE	9.7	J	0.7	1.4	3.9
72-20-8	Endrin	1.3	UJ	0.67	1.3	3.9
33213-65-9	Endosulfan II	1.5	U	0.75	1.5	3.9
72-54-8	4,4'-DDD	4.6	J	1.3	2.6	3.9
1031-07-8	Endosulfan sulfate	1	UJ	0.52	1	3.9
50-29-3	4,4'-DDT	2	U	0.98	2	3.9
72-43-5	Methoxychlor	1.4	U	0.7	1.4	3.9
7421-93-4	Endrin aldehyde	1.8	U	0.93	1.8	3.9
5103-74-2	gamma-Chlordane	0.88	U	0.44	0.88	3.9
5103-71-9	alpha-Chlordane	0.82	U	0.41	0.82	3.9
53494-70-5	Endrin ketone	1.1	U	0.54	1.1	3.9
8001-35-2	Toxaphene	130	U	86	130	130

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306 Lab File ID: 93-06D2.D

Sample wt/vol: 25.34 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1912

PercentSolids: 59.1 decanted : Dilution Factor: 2

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	4	U	2.6	4	4
319-85-7	beta-BHC	0.8	U	0.4	0.8	4
319-86-8	delta-BHC	1.5	U	0.75	1.5	4
58-89-9	gamma-BHC (Lindane)	1.1	U	0.53	1.1	4
76-44-8	Heptachlor	1.1	U	0.53	1.1	4
309-00-2	Aldrin	0.8	U	0.4	0.8	4
1024-57-3	Heptachlor epoxide	0.8	U	0.4	0.8	4
959-98-8	Endosulfan I	1.2	U	0.59	1.2	4
60-57-1	Dieldrin	0.85	U	0.43	0.85	4
72-55-9	4,4'-DDE	2.9	J	0.72	1.4	4
72-20-8	Endrin	1.4	U	0.69	1.4	4
33213-65-9	Endosulfan II	1.5	U	0.77	1.5	4
72-54-8	4,4'-DDD	2.7	U	1.4	2.7	4
1031-07-8	Endosulfan sulfate	1.1	U	0.53	1.1	4
50-29-3	4,4'-DDT	2	U	1	2	4
72-43-5	Methoxychlor	1.4	U	0.72	1.4	4
7421-93-4	Endrin aldehyde	1.9	U	0.96	1.9	4
5103-74-2	gamma-Chlordane	0.91	U	0.45	0.91	4
5103-71-9	alpha-Chlordane	0.85	U	0.43	0.85	4
53494-70-5	Endrin ketone	1.1	U	0.56	1.1	4
8001-35-2	Toxaphene	130	U	89	130	130

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307 Lab File ID: 93-07D2.D

Sample wt/vol: 25.37 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1930

PercentSolids: 56.6 decanted : Dilution Factor: 2

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	4.2 UJ OT	U	2.7	4.2	4.2
319-85-7	beta-BHC	0.84	U	0.42	0.84	4.2
319-86-8	delta-BHC	1.6	U	0.78	1.6	4.2
58-89-9	gamma-BHC (Lindane)	1.1	U	0.56	1.1	4.2
76-44-8	Heptachlor	1.1	U	0.56	1.1	4.2
309-00-2	Aldrin	0.84	U	0.42	0.84	4.2
1024-57-3	Heptachlor epoxide	0.84	U	0.42	0.84	4.2
959-98-8	Endosulfan I	1.2	U	0.61	1.2	4.2
60-57-1	Dieldrin	0.89 J	U	0.44	0.89	4.2
72-55-9	4,4'-DDE	5.9 J		0.75	1.5	4.2
72-20-8	Endrin	1.4 UJ	U	0.72	1.4	4.2
33213-65-9	Endosulfan II	1.6	U	0.81	1.6	4.2
72-54-8	4,4'-DDD	2.8 J OT	J	1.4	2.8	4.2
1031-07-8	Endosulfan sulfate	1.1 UJ	U	0.56	1.1	4.2
50-29-3	4,4'-DDT	2.1	U	1	2.1	4.2
72-43-5	Methoxychlor	1.5	U	0.75	1.5	4.2
7421-93-4	Endrin aldehyde	2	U	1	2	4.2
5103-74-2	gamma-Chlordane	0.95	U	0.47	0.95	4.2
5103-71-9	alpha-Chlordane	0.89	U	0.44	0.89	4.2
53494-70-5	Endrin ketone	1.2	U	0.58	1.2	4.2
8001-35-2	Toxaphene	140	U	93	140	140

Results reported on Primary Column, if RPD >40% results flagged accordingly.

4/13/11

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308 Lab File ID: 93-08D2.D

Sample wt/vol: 25.34 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 1947

PercentSolids: 50.8 decanted : Dilution Factor: 2

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	4.7 UJ OT	U	3	4.7	4.7
319-85-7	beta-BHC	0.93	U	0.47	0.93	4.7
319-86-8	delta-BHC	1.7	U	0.87	1.7	4.7
58-89-9	gamma-BHC (Lindane)	1.2	U	0.62	1.2	4.7
76-44-8	Heptachlor	1.2	U	0.62	1.2	4.7
309-00-2	Aldrin	0.93	U	0.47	0.93	4.7
1024-57-3	Heptachlor epoxide	0.93	U	0.47	0.93	4.7
959-98-8	Endosulfan I	1.4	U	0.68	1.4	4.7
60-57-1	Dieldrin	0.99	U	0.5	0.99	4.7
72-55-9	4,4'-DDE	1.7	U	0.84	1.7	4.7
72-20-8	Endrin	1.6	U	0.81	1.6	4.7
33213-65-9	Endosulfan II	1.8	U	0.9	1.8	4.7
72-54-8	4,4'-DDD	3.2	U	1.6	3.2	4.7
1031-07-8	Endosulfan sulfate	1.2	U	0.62	1.2	4.7
50-29-3	4,4'-DDT	2.4	U	1.2	2.4	4.7
72-43-5	Methoxychlor	1.7	U	0.84	1.7	4.7
7421-93-4	Endrin aldehyde	2.2	U	1.1	2.2	4.7
5103-74-2	gamma-Chlordane	1	U	0.53	1	4.7
5103-71-9	alpha-Chlordane	0.99	U	0.5	0.99	4.7
53494-70-5	Endrin ketone	1.3	U	0.65	1.3	4.7
8001-35-2	Toxaphene	160	U	100	160	160

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD008-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309 Lab File ID: 93-09.D

Sample wt/vol: 25.32 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 2005

PercentSolids: 78.6 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	1.5 UJ OT	U	0.96	1.5	1.5
319-85-7	beta-BHC	0.3	U	0.15	0.3	1.5
319-86-8	delta-BHC	0.56	U	0.28	0.56	1.5
58-89-9	gamma-BHC (Lindane)	0.4	U	0.2	0.4	1.5
76-44-8	Heptachlor	0.4	U	0.2	0.4	1.5
309-00-2	Aldrin	0.3	U	0.15	0.3	1.5
1024-57-3	Heptachlor epoxide	0.3	U	0.15	0.3	1.5
959-98-8	Endosulfan I	0.44	U	0.22	0.44	1.5
60-57-1	Dieldrin	0.32	U	0.16	0.32	1.5
72-55-9	4,4'-DDE	0.54	U	0.27	0.54	1.5
72-20-8	Endrin	0.52	U	0.26	0.52	1.5
33213-65-9	Endosulfan II	0.58	U	0.29	0.58	1.5
72-54-8	4,4'-DDD	1	U	0.51	1	1.5
1031-07-8	Endosulfan sulfate	0.4	U	0.2	0.4	1.5
50-29-3	4,4'-DDT	0.76	U	0.38	0.76	1.5
72-43-5	Methoxychlor	0.54	U	0.27	0.54	1.5
7421-93-4	Endrin aldehyde	0.72	U	0.36	0.72	1.5
5103-74-2	gamma-Chlordane	0.34	U	0.17	0.34	1.5
5103-71-9	alpha-Chlordane	0.32	U	0.16	0.32	1.5
53494-70-5	Endrin ketone	0.42	U	0.21	0.42	1.5
8001-35-2	Toxaphene	50	U	33	50	50

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD009-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310 Lab File ID: 93-10D2.D

Sample wt/vol: 25.28 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 2023

PercentSolids: 32.1 decanted : Dilution Factor: 2

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	7.4	U	4.7	7.4	7.4
319-85-7	beta-BHC	1.5	U	0.74	1.5	7.4
319-86-8	delta-BHC	2.8	U	1.4	2.8	7.4
58-89-9	gamma-BHC (Lindane)	2	U	0.98	2	7.4
76-44-8	Heptachlor	2	U	0.98	2	7.4
309-00-2	Aldrin	1.5	U	0.74	1.5	7.4
1024-57-3	Heptachlor epoxide	1.5	U	0.74	1.5	7.4
959-98-8	Endosulfan I	2.2	U	1.1	2.2	7.4
60-57-1	Dieldrin	1.6	U	0.79	1.6	7.4
72-55-9	4,4'-DDE	66		1.3	2.7	7.4
72-20-8	Endrin	2.6	U	1.3	2.6	7.4
33213-65-9	Endosulfan II	2.8	U	1.4	2.8	7.4
72-54-8	4,4'-DDD	34		2.5	5	7.4
1031-07-8	Endosulfan sulfate	2	U	0.98	2	7.4
50-29-3	4,4'-DDT	3.7	U	1.9	3.7	7.4
72-43-5	Methoxychlor	2.7	U	1.3	2.7	7.4
7421-93-4	Endrin aldehyde	3.5	U	1.8	3.5	7.4
5103-74-2	gamma-Chlordane	1.7	U	0.84	1.7	7.4
5103-71-9	alpha-Chlordane	1.6	U	0.79	1.6	7.4
53494-70-5	Endrin ketone	2.1	U	1	2.1	7.4
8001-35-2	Toxaphene	250	U	160	250	250

X1 cort JAC 41611

Results reported on Primary Column, if RPD >40% results flagged accordingly.

JAC 41211

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311 Lab File ID: 93-11D2.D

Sample wt/vol: 25.31 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 2040

PercentSolids: 61.4 decanted : Dilution Factor: 2

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	3.9 UJ 0T	U	2.5	3.9	3.9
319-85-7	beta-BHC	0.77	U	0.39	0.77	3.9
319-86-8	delta-BHC	1.4	U	0.72	1.4	3.9
58-89-9	gamma-BHC (Lindane)	1	U	0.51	1	3.9
76-44-8	Heptachlor	1	U	0.51	1	3.9
309-00-2	Aldrin	0.77	U	0.39	0.77	3.9
1024-57-3	Heptachlor epoxide	0.77	U	0.39	0.77	3.9
959-98-8	Endosulfan I	1.1	U	0.57	1.1	3.9
60-57-1	Dieldrin	0.82	U	0.41	0.82	3.9
72-55-9	4,4'-DDE	7.5	P	0.69	1.4	3.9
72-20-8	Endrin	1.3 UJ	U	0.67	1.3	3.9
33213-65-9	Endosulfan II	1.5 J	U	0.75	1.5	3.9
72-54-8	4,4'-DDD	5.4		1.3	2.6	3.9
1031-07-8	Endosulfan sulfate	1 UJ	U	0.51	1	3.9
50-29-3	4,4'-DDT	2 + UJ 2C	JP	0.98	2	3.9
72-43-5	Methoxychlor	1.4 UJ 0T	U	0.69	1.4	3.9
7421-93-4	Endrin aldehyde	1.8	U	0.93	1.8	3.9
5103-74-2	gamma-Chlordane	0.88	U	0.44	0.88	3.9
5103-71-9	alpha-Chlordane	0.82	U	0.41	0.82	3.9
53494-70-5	Endrin ketone	1.1	U	0.54	1.1	3.9
8001-35-2	Toxaphene	130	U	86	130	130

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312 Lab File ID: 93-12.D

Sample wt/vol: 25.55 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 2058

PercentSolids: 91.9 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	1.3 UJ OT	U	0.82	1.3	1.3
319-85-7	beta-BHC	0.26	U	0.13	0.26	1.3
319-86-8	delta-BHC	0.48	U	0.24	0.48	1.3
58-89-9	gamma-BHC (Lindane)	0.34	U	0.17	0.34	1.3
76-44-8	Heptachlor	0.34	U	0.17	0.34	1.3
309-00-2	Aldrin	0.26	U	0.13	0.26	1.3
1024-57-3	Heptachlor epoxide	0.26	U	0.13	0.26	1.3
959-98-8	Endosulfan I	0.37	U	0.19	0.37	1.3
60-57-1	Dieldrin	0.27	U	0.14	0.27	1.3
72-55-9	4,4'-DDE	14		0.23	0.46	1.3
72-20-8	Endrin	0.44 UJ	U	0.22	0.44	1.3
33213-65-9	Endosulfan II	0.49	U	0.25	0.49	1.3
72-54-8	4,4'-DDD	1.4		0.43	0.87	1.3
1031-07-8	Endosulfan sulfate	0.34 UJ	U	0.17	0.34	1.3
50-29-3	4,4'-DDT	7		0.32	0.65	1.3
72-43-5	Methoxychlor	0.46 UJ	U	0.23	0.46	1.3
7421-93-4	Endrin aldehyde	0.61	U	0.31	0.61	1.3
5103-74-2	gamma-Chlordane	0.29	U	0.14	0.29	1.3
5103-71-9	alpha-Chlordane	0.27	U	0.14	0.27	1.3
53494-70-5	Endrin ketone	0.36	U	0.18	0.36	1.3
8001-35-2	Toxaphene	42	U	28	42	42

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313 Lab File ID: 93-13.D

Sample wt/vol: 25.05 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 2116

PercentSolids: 92 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	1.3	U	0.83	1.3	1.3
319-85-7	beta-BHC	0.26	U	0.13	0.26	1.3
319-86-8	delta-BHC	0.48	U	0.24	0.48	1.3
58-89-9	gamma-BHC (Lindane)	0.35	U	0.17	0.35	1.3
76-44-8	Heptachlor	0.35	U	0.17	0.35	1.3
309-00-2	Aldrin	0.26	U	0.13	0.26	1.3
1024-57-3	Heptachlor epoxide	0.26	U	0.13	0.26	1.3
959-98-8	Endosulfan I	0.38	U	0.19	0.38	1.3
60-57-1	Dieldrin	0.28	U	0.14	0.28	1.3
72-55-9	4,4'-DDE	16		0.23	0.47	1.3
72-20-8	Endrin	0.45	U	0.22	0.45	1.3
33213-65-9	Endosulfan II	0.5	U	0.25	0.5	1.3
72-54-8	4,4'-DDD	1.7	P	0.44	0.88	1.3
1031-07-8	Endosulfan sulfate	0.35	U	0.17	0.35	1.3
50-29-3	4,4'-DDT	5.9		0.33	0.66	1.3
72-43-5	Methoxychlor	0.47	U	0.23	0.47	1.3
7421-93-4	Endrin aldehyde	0.62	U	0.31	0.62	1.3
5103-74-2	gamma-Chlordane	0.3	U	0.15	0.3	1.3
5103-71-9	alpha-Chlordane	0.28	U	0.14	0.28	1.3
53494-70-5	Endrin ketone	0.36	U	0.18	0.36	1.3
8001-35-2	Toxaphene	43	U	29	43	43

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020411

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199314 Lab File ID: 993-14.D

Sample wt/vol: 960 Units: ML Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0245

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0017	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.009	U	0.0045	0.009	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.004	0.0079	0.052
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0017	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.52

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301 Lab File ID: 993-01.D

Sample wt/vol: 25.02 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1007

PercentSolids: 52 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	40	U	20	40	46
11096-82-5	Aroclor-1260	19	U	9.4	19	46
11104-28-2	Aroclor-1221	37	U	18	37	46
11141-16-5	Aroclor-1232	46	U	31	46	46
53469-21-9	Aroclor-1242	34	U	17	34	46
12672-29-6	Aroclor-1248	34	U	17	34	46
11097-69-1	Aroclor-1254	29	U	15	29	46

JAC 4/21/11

Results reported on Primary Column, If RPD >40% results flagged accordingly.

1

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304 Lab File ID: 93-04.D

Sample wt/vol: 25.43 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1359

PercentSolids: 52.7 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	39	U	19	39	45
11096-82-5	Aroclor-1260	18	U	9.1	18	45
11104-28-2	Aroclor-1221	36	U	18	36	45
11141-16-5	Aroclor-1232	45	U	30	45	45
53469-21-9	Aroclor-1242	33	U	16	33	45
12672-29-6	Aroclor-1248	33	U	16	33	45
11097-69-1	Aroclor-1254	160		14	28	45

4/21/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD005-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305 Lab File ID: 93-05.D

Sample wt/vol: 25.55 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1414

PercentSolids: 60.7 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	34 UJ OT	U	17	34	39
11096-82-5	Aroclor-1260	16	U	7.9	16	39
11104-28-2	Aroclor-1221	31	U	15	31	39
11141-16-5	Aroclor-1232	39	U	26	39	39
53469-21-9	Aroclor-1242	28	U	14	28	39
12672-29-6	Aroclor-1248	28	U	14	28	39
11097-69-1	Aroclor-1254	32 J	J	12	24	39

JMC 4/21

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306 Lab File ID: 93-06.D

Sample wt/vol: 25.34 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1429

PercentSolids: 59.1 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	35 UJ OT	U	17	35	40
11096-82-5	Aroclor-1260	16	U	8.1	16	40
11104-28-2	Aroclor-1221	32	U	16	32	40
11141-16-5	Aroclor-1232	40	U	27	40	40
53469-21-9	Aroclor-1242	29	U	15	29	40
12672-29-6	Aroclor-1248	29	U	15	29	40
11097-69-1	Aroclor-1254	25	U	13	25	40

JC 4/21/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307 Lab File ID: 93-07.D

Sample wt/vol: 25.37 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1444

PercentSolids: 56.6 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	36	UJ	18	36	42
11096-82-5	Aroclor-1260	17	U	8.5	17	42
11104-28-2	Aroclor-1221	33	U	17	33	42
11141-16-5	Aroclor-1232	42	U	28	42	42
53469-21-9	Aroclor-1242	31	U	15	31	42
12672-29-6	Aroclor-1248	31	U	15	31	42
11097-69-1	Aroclor-1254	30	J	13	26	42

DT

JP

JJC 41211

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD007-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308 Lab File ID: 993-08.D

Sample wt/vol: 25.34 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1223

PercentSolids: 50.8 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	40 UJ OT	U	20	40	47
11096-82-5	Aroclor-1260	19	U	9.5	19	47
11104-28-2	Aroclor-1221	37	U	19	37	47
11141-16-5	Aroclor-1232	47	U	31	47	47
53469-21-9	Aroclor-1242	34	U	17	34	47
12672-29-6	Aroclor-1248	34	U	17	34	47
11097-69-1	Aroclor-1254	30	U	15	30	47

JMC 4/21

Results reported on Primary Column, If RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD008-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309 Lab File ID: 993-09.D

Sample wt/vol: 25.32 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1238

PercentSolids: 78.6 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	26	UJ DT U	13	26	30
11096-82-5	Aroclor-1260	12	U	6.1	12	30
11104-28-2	Aroclor-1221	24	U	12	24	30
11141-16-5	Aroclor-1232	30	U	20	30	30
53469-21-9	Aroclor-1242	22	U	11	22	30
12672-29-6	Aroclor-1248	22	U	11	22	30
11097-69-1	Aroclor-1254	19	U	9.5	19	30

JMC 4/12/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD009-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310 Lab File ID: 93-10.D

Sample wt/vol: 25.28 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1459

PercentSolids: 32.1 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
12674-11-2	Aroclor-1016	64 WJ OT	U	32	64	74
11096-82-5	Aroclor-1260	30	U	15	30	74
11104-28-2	Aroclor-1221	59	U	30	59	74
11141-16-5	Aroclor-1232	74	U	49	74	74
53469-21-9	Aroclor-1242	54	U	27	54	74
12672-29-6	Aroclor-1248	54	U	27	54	74
11097-69-1	Aroclor-1254	260 J		23	47	74

JJC 41211

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311 Lab File ID: 93-11.D

Sample wt/vol: 25.31 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1514

PercentSolids: 61.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
12674-11-2	Aroclor-1016	33 UJ OT	U	17	33	39
11096-82-5	Aroclor-1260	16	U	7.8	16	39
11104-28-2	Aroclor-1221	31	U	15	31	39
11141-16-5	Aroclor-1232	39	U	26	39	39
53469-21-9	Aroclor-1242	28	U	14	28	39
12672-29-6	Aroclor-1248	28	U	14	28	39
11097-69-1	Aroclor-1254	48 J	P	12	24	39

JMC 4/12/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312 Lab File ID: 93-12.D

Sample wt/vol: 25.55 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1529

PercentSolids: 91.9 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	22 UJ DT	U	11	22	26
11096-82-5	Aroclor-1260	10	U	5.2	10	26
11104-28-2	Aroclor-1221	20	U	10	20	26
11141-16-5	Aroclor-1232	26	U	17	26	26
53469-21-9	Aroclor-1242	19	U	9.4	19	26
12672-29-6	Aroclor-1248	19	U	9.4	19	26
11097-69-1	Aroclor-1254	42 NJ	P	8.1	16	26

JMC 4/12/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313 Lab File ID: 93-13.D

Sample wt/vol: 25.05 Units: G Date Received: 02/07/11

Concentrated Extract Volume: 10 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1630

PercentSolids: 92 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	22 UJ OT	U	11	22	26
11096-82-5	Aroclor-1260	10	U	5.3	10	26
11104-28-2	Aroclor-1221	21	U	10	21	26
11141-16-5	Aroclor-1232	26	U	17	26	26
53469-21-9	Aroclor-1242	19	U	9.5	19	26
12672-29-6	Aroclor-1248	19	U	9.5	19	26
11097-69-1	Aroclor-1254	120 J		8.2	16	26

JMC 4/12/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020411

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199314 Lab File ID: 993-14.D

Sample wt/vol: 970 Units: ML Date Received: 02/07/11

Concentrated Extract Volume: 2 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1509

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

JAC 41211

Results reported on Primary Column, if RPD >40% results flagged accordingly.

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 52 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	8980000		J N MSH	P	19400	38900	102000
7440-36-0	Antimony	4910	U	UJ N MSL	P	2450	4910	10200
7440-39-3	Barium	25800			P	1640	3270	5110
7440-41-7	Beryllium	3270	U		P	1640	3270	5110
7440-43-9	Cadmium	1980	J		P	511	1020	5110
7440-70-2	Calcium	114000000			P	33800	67500	102000
7440-48-4	Cobalt	5140			P	511	1020	5110
7440-50-8	Copper	138000		J N MSH	P	1640	3270	5110
7439-89-6	Iron	26700000			P	6140	12300	51100
7439-92-1	Lead	442000			P	3480	6960	8180
7439-95-4	Magnesium	6430000		J N MSH	P	29700	59300	102000
7439-96-5	Manganese	294000			P	1640	3270	5110
7439-97-6	Mercury	88			CV	4.29	8.57	23.2
7440-02-0	Nickel	10200		J NE SD	P	1640	3270	5110
7440-09-7	Potassium	1760000			P	51100	102000	511000
7440-22-4	Silver	3270	U		P	1640	3270	5110
7440-23-5	Sodium	12600000		J N MSH	P	102000	204000	307000
7440-28-0	Thallium	6960	U		P	3480	6960	10200
7440-62-2	Vanadium	38600		N	P	1640	3270	5110
7440-66-6	Zinc	440000			P	3380	6750	10200

JAC 4/8/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1925

102

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 52.7 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	7820000		J MSH	P	18800	37600	98800
7440-36-0	Antimony	4740	V	UJ MSL	P	2370	4740	9880
7440-39-3	Barium	15100			P	1580	3160	4940
7440-41-7	Beryllium	3160	U		P	1580	3160	4940
7440-43-9	Cadmium	1750	J		P	494	988	4940
7440-70-2	Calcium	94400000			P	32600	65200	98800
7440-48-4	Cobalt	4130	J		P	494	988	4940
7440-50-8	Copper	73400		J MSH	P	1580	3160	4940
7439-89-6	Iron	18800000			P	5930	11800	49400
7439-92-1	Lead	185000			P	3360	6720	7910
7439-95-4	Magnesium	5390000		J MSH	P	28700	57300	98800
7439-96-5	Manganese	245000			P	1580	3160	4940
7439-97-6	Mercury	64.2			CV	3.55	7.11	19.2
7440-02-0	Nickel	6410		J SD	P	1580	3160	4940
7440-09-7	Potassium	1700000			P	49400	98800	494000
7440-22-4	Silver	3160	U		P	1580	3160	4940
7440-23-5	Sodium	12600000		J MSH	P	98800	198000	296000
7440-28-0	Thallium	6720	U		P	3360	6720	9880
7440-62-2	Vanadium	32600			P	1580	3160	4940
7440-66-6	Zinc	262000			P	3260	6520	9880

AC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1925

105

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 60.7 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	10700000		J OT	P	16400	32800	86200
7440-36-0	Antimony	4140	U	UJ	P	2070	4140	8620
7440-39-3	Barium	18500		J	P	1380	2760	4310
7440-41-7	Beryllium	2760	U	UJ	P	1380	2760	4310
7440-43-9	Cadmium	4140	U	J	P	431	862	4310
7440-70-2	Calcium	87100000			P	28500	56900	86200
7440-48-4	Cobalt	7890			P	431	862	4310
7440-50-8	Copper	71500			P	1380	2760	4310
7439-89-6	Iron	26400000			P	5180	10400	43100
7439-92-1	Lead	157000			P	2930	5860	6900
7439-95-4	Magnesium	7660000			P	25000	50000	86200
7439-96-5	Manganese	266000			P	1380	2760	4310
7439-97-6	Mercury	44.6			CV	3.51	7.02	19
7440-02-0	Nickel	11400			P	1380	2760	4310
7440-09-7	Potassium	1940000			P	43100	86200	431000
7440-22-4	Silver	2760	U	UJ	P	1380	2760	4310
7440-23-5	Sodium	9270000		J	P	86200	172000	259000
7440-28-0	Thallium	5170	U		P	2930	5860	8620
7440-62-2	Vanadium	59700			P	1380	2760	4310
7440-66-6	Zinc	237000			P	2850	5690	8620

JMC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

160311 1925

104

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 59.1 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	7030000		J OT	P	17100	34200	90100
7440-36-0	Antimony	3880	U	J	P	2160	4320	9010
7440-39-3	Barium	13300		J	P	1440	2880	4500
7440-41-7	Beryllium	2880	U	UJ	P	1440	2880	4500
7440-43-9	Cadmium	1650	U	J	P	450	901	4500
7440-70-2	Calcium	140000000		J	P	29700	59500	90100
7440-48-4	Cobalt	3100	U	J	P	450	901	4500
7440-50-8	Copper	54100		J	P	1440	2880	4500
7439-89-6	Iron	17100000		J	P	5400	10800	45000
7439-92-1	Lead	93000		J	P	3060	6130	7210
7439-95-4	Magnesium	7720000		J	P	26100	52200	90100
7439-96-5	Manganese	123000		J	P	1440	2880	4500
7439-97-6	Mercury	28.8		J	CV	3.14	6.28	17
7440-02-0	Nickel	8360		J	P	1440	2880	4500
7440-09-7	Potassium	1360000		J	P	45000	90100	450000
7440-22-4	Silver	2880	U	UJ	P	1440	2880	4500
7440-23-5	Sodium	10300000		J	P	90100	180000	270000
7440-28-0	Thallium	6130	U	UJ	P	3060	6130	9010
7440-62-2	Vanadium	26700		J	P	1440	2880	4500
7440-66-6	Zinc	206000		J	P	2970	5950	9010

JAC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1925

105

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 56.6 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	5720000		J DT	P	19200	38400	101000
7440-36-0	Antimony	4850	U	UJ	P	2420	4850	10100
7440-39-3	Barium	9730		J	P	1620	3230	5050
7440-41-7	Beryllium	3230	U	UJ	P	1620	3230	5050
7440-43-9	Cadmium	1000	U	J	P	505	1010	5050
7440-70-2	Calcium	106000000			P	33300	66600	101000
7440-48-4	Cobalt	3120	U		P	505	1010	5050
7440-50-8	Copper	46700			P	1620	3230	5050
7439-89-6	Iron	16500000			P	6060	12100	50500
7439-92-1	Lead	79300			P	3430	6860	8080
7439-95-4	Magnesium	4390000			P	29300	58600	101000
7439-96-5	Manganese	116000			P	1620	3230	5050
7439-97-6	Mercury	33.6			CV	3.95	7.9	21.3
7440-02-0	Nickel	5540			P	1620	3230	5050
7440-09-7	Potassium	1210000			P	50500	101000	505000
7440-22-4	Silver	3230	U	UJ	P	1620	3230	5050
7440-23-5	Sodium	9700000		J	P	101000	202000	303000
7440-28-0	Thallium	6860	U	UJ	P	3430	6860	10100
7440-62-2	Vanadium	21500		J	P	1620	3230	5050
7440-66-6	Zinc	162000		J	P	3330	6660	10100

JHC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

M0311 1925

106

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 50.8 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	5460000		J DT	P	21100	42200	111000
7440-36-0	Antimony	5330	U	UJ	P	2670	5330	11100
7440-39-3	Barium	7390		J	P	1780	3550	5550
7440-41-7	Beryllium	3550	U	UJ	P	1780	3550	5550
7440-43-9	Cadmium	903	J	J	P	555	1110	5550
7440-70-2	Calcium	93800000			P	36600	73300	111000
7440-48-4	Cobalt	1770	J		P	555	1110	5550
7440-50-8	Copper	13600			P	1780	3550	5550
7439-89-6	Iron	6750000			P	6660	13300	55500
7439-92-1	Lead	11800			P	3780	7550	8890
7439-95-4	Magnesium	3580000			P	32200	64400	111000
7439-96-5	Manganese	60100			P	1780	3550	5550
7439-97-6	Mercury	20.5	J		CV	4.14	8.28	22.4
7440-02-0	Nickel	3550	U	UJ	P	1780	3550	5550
7440-09-7	Potassium	1380000		J	P	55500	111000	555000
7440-22-4	Silver	3550	U	UJ	P	1780	3550	5550
7440-23-5	Sodium	12400000		J	P	111000	222000	333000
7440-28-0	Thallium	7550	U	UJ	P	3780	7550	11100
7440-62-2	Vanadium	17600		J	P	1780	3550	5550
7440-66-6	Zinc	25400		J	P	3660	7330	11100

JMC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

160311 1025

107

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD008-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 78.6 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	2120000		J OT	P	16900	33800	89000
7440-36-0	Antimony	4270	U	UJ	P	2140	4270	8900
7440-39-3	Barium	10300		J	P	1420	2850	4450
7440-41-7	Beryllium	2850	U	UJ	P	1420	2850	4450
7440-43-9	Cadmium	775	J	J	P	445	890	4450
7440-70-2	Calcium	105000000			P	29400	58700	89000
7440-48-4	Cobalt	925	J		P	445	890	4450
7440-50-8	Copper	5080			P	1420	2850	4450
7439-89-6	Iron	3310000			P	5340	10700	44500
7439-92-1	Lead	6800	J		P	3020	6050	7120
7439-95-4	Magnesium	3110000			P	25800	51600	89000
7439-96-5	Manganese	89400			P	1420	2850	4450
7439-97-6	Mercury	7.42	J		CV	2.48	4.96	13.4
7440-02-0	Nickel	2850	U	UJ	P	1420	2850	4450
7440-09-7	Potassium	699000		J	P	44500	89000	445000
7440-22-4	Silver	2850	U	UJ	P	1420	2850	4450
7440-23-5	Sodium	10900000		J	P	89000	178000	267000
7440-28-0	Thallium	6050	U	UJ	P	3020	6050	8900
7440-62-2	Vanadium	9580		J	P	1420	2850	4450
7440-66-6	Zinc	11000		J	P	2940	5870	8900

JMC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1925

106

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD009-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 32.1 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	14400000		J OT	P	29700	59500	156000
7440-36-0	Antimony	7510	U	UJ	P	3760	7510	15600
7440-39-3	Barium	33800		J	P	2500	5010	7830
7440-41-7	Beryllium	5010	U	UJ	P	2500	5010	7830
7440-43-9	Cadmium	5690		J	P	783	1560	7830
7440-70-2	Calcium	72900000			P	51700	103000	156000
7440-48-4	Cobalt	9000			P	783	1560	7830
7440-50-8	Copper	204000			P	2500	5010	7830
7439-89-6	Iron	45900000			P	9390	18800	78300
7439-92-1	Lead	612000			P	5320	10600	12500
7439-95-4	Magnesium	11900000			P	45400	90800	156000
7439-96-5	Manganese	356000			P	2500	5010	7830
7439-97-6	Mercury	129			CV	6.52	13	35.2
7440-02-0	Nickel	19100			P	2500	5010	7830
7440-09-7	Potassium	3450000			P	78300	156000	783000
7440-22-4	Silver	5010	U	UJ	P	2500	5010	7830
7440-23-5	Sodium	27800000		J	P	156000	313000	470000
7440-28-0	Thallium	10600	U	UJ	P	5320	10600	15600
7440-62-2	Vanadium	66100		J	P	2500	5010	7830
7440-66-6	Zinc	849000		J	P	5170	10300	15600

JAC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1925

105

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 61.4 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	6030000		J	P	16200	32400	85400
7440-36-0	Antimony	4100	B	UJ	P	2050	4100	8540
7440-39-3	Barium	14800		J	P	1360	2730	4270
7440-41-7	Beryllium	2730	B	UJ	P	1360	2730	4270
7440-43-9	Cadmium	1620	B	J	P	427	854	4270
7440-70-2	Calcium	110000000			P	28200	56300	85400
7440-48-4	Cobalt	3810	B		P	427	854	4270
7440-50-8	Copper	56900			P	1360	2730	4270
7439-89-6	Iron	18600000			P	5120	10200	42700
7439-92-1	Lead	134000			P	2900	5800	6830
7439-95-4	Magnesium	4100000			P	24800	49500	85400
7439-96-5	Manganese	164000			P	1360	2730	4270
7439-97-6	Mercury	55.4			CV	3.38	6.77	18.3
7440-02-0	Nickel	6660			P	1360	2730	4270
7440-09-7	Potassium	1170000			P	42700	85400	427000
7440-22-4	Silver	2730	B	UJ	P	1360	2730	4270
7440-23-5	Sodium	8010000		J	P	85400	171000	256000
7440-28-0	Thallium	5800	B	UJ	P	2900	5800	8540
7440-62-2	Vanadium	29800		J	P	1360	2730	4270
7440-66-6	Zinc	164000		J	P	2820	5630	8540

JMC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1925

116

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD0011-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 91.9 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	5400000		J OT	P	15400	30800	81000
7440-36-0	Antimony	3890	U	UJ	P	1940	3890	8100
7440-39-3	Barium	49800		J	P	1300	2590	4050
7440-41-7	Beryllium	2590	U	UJ	P	1300	2590	4050
7440-43-9	Cadmium	500	J	J	P	405	810	4050
7440-70-2	Calcium	107000000			P	26700	53400	81000
7440-48-4	Cobalt	3400	J		P	405	810	4050
7440-50-8	Copper	57600			P	1300	2590	4050
7439-89-6	Iron	11200000			P	4860	9720	40500
7439-92-1	Lead	12100			P	2750	5500	6480
7439-95-4	Magnesium	5280000			P	23500	47000	81000
7439-96-5	Manganese	229000			P	1300	2590	4050
7439-97-6	Mercury	8.97	J		CV	3.7	7.4	20
7440-02-0	Nickel	3030	J		P	1300	2590	4050
7440-09-7	Potassium	847000			P	40500	81000	405000
7440-22-4	Silver	2590	U	UJ	P	1300	2590	4050
7440-23-5	Sodium	5390000		J	P	81000	162000	243000
7440-28-0	Thallium	5500	U	UJ	P	2750	5500	8100
7440-62-2	Vanadium	32700		J	P	1300	2590	4050
7440-66-6	Zinc	56900		J	P	2670	5340	8100

4/8/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1925

111

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD0011P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 92 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	5610000		J	P	17400	34900	91800
7440-36-0	Antimony	4410	U	UJ	P	2200	4410	9180
7440-39-3	Barium	48600		J	P	1470	2940	4590
7440-41-7	Beryllium	2940	U	UJ	P	1470	2940	4590
7440-43-9	Cadmium	918	U	UJ	P	459	918	4590
7440-70-2	Calcium	99200000		J	P	30300	60600	91800
7440-48-4	Cobalt	4050	U	J	P	459	918	4590
7440-50-8	Copper	72000			P	1470	2940	4590
7439-89-6	Iron	11900000			P	5510	11000	45900
7439-92-1	Lead	12700			P	3120	6240	7340
7439-95-4	Magnesium	5380000			P	26600	53200	91800
7439-96-5	Manganese	247000			P	1470	2940	4590
7439-97-6	Mercury	10.6	U		CV	2.87	5.74	15.5
7440-02-0	Nickel	3560	U		P	1470	2940	4590
7440-09-7	Potassium	874000			P	45900	91800	459000
7440-22-4	Silver	2940	U	UJ	P	1470	2940	4590
7440-23-5	Sodium	5020000		J	P	91800	184000	275000
7440-28-0	Thallium	6240	U	UJ	P	3120	6240	9180
7440-62-2	Vanadium	35000		J	P	1470	2940	4590
7440-66-6	Zinc	58000		J	P	3030	6060	9180

4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1925

112

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020411

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199314

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	18.6	U		P	9.3	18.6	100
7440-39-3	Barium	0.44	U		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	78	U		P	39	78	100
7439-89-6	Iron	20.1	J		P	5.5	11	40
7439-95-4	Magnesium	19.6	U		P	9.8	19.6	100
7439-96-5	Manganese	0.7	U		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.86	U		P	0.93	1.86	4.1
7440-09-7	Potassium	143	U		P	71.7	143	500
7782-49-2	Selenium	8.2	U		P	4.1	8.2	9
7440-23-5	Sodium	300	U		P	180	300	300
7440-28-0	Thallium	8.8	U		P	4.4	8.8	10
7440-62-2	Vanadium	0.88	U		P	0.44	0.88	9
7440-66-6	Zinc	8	U		P	4	8	20

JC 4811

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1925

115

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-EB01-020411

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): WATER Lab Sample ID: K0204-12

Level (low/med): MED Date Received: 02/07/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.61	~~B~~ J		MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.5	U		MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	0.29	~~B~~ J		MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.024	~~B~~ J		MS	0.024	0.20	1.0
7440-50-8	Copper	0.5	U		MS	0.23	0.50	5.0
7439-92-1	Lead	0.18	~~B~~ J		MS	0.068	0.20	1.0
7440-22-4	Silver	0.05	U		MS	0.022	0.050	1.0

JAC 4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.: VWW06-SD0010-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-09

Level (low/med): MED Date Received: 02/07/2011

% Solids: 61.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	4.4		J OT	MS	0.42	0.57	0.57
7440-47-3	Chromium	19.3		J	MS	0.16	0.57	1.1
7782-49-2	Selenium	0.57	~~B~~	UJ	MS	0.17	0.57	2.9

JLC 4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD0011-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-10

Level (low/med): MED Date Received: 02/07/2011

% Solids: 92.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	1.2		J OT	MS	0.40	0.54	0.54
7440-47-3	Chromium	6.5		J	MS	0.15	0.54	1.1
7782-49-2	Selenium	0.54	~~B~~	UJ ↓	MS	0.16	0.54	2.7

JMC 4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.: VWW06-SD0011P-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-11

Level (low/med): MED Date Received: 02/07/2011

% Solids: 92.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	0.96		J OT	MS	0.32	0.43	0.43
7440-47-3	Chromium	6.6		J	MS	0.12	0.43	0.86
7782-49-2	Selenium	0.43		UJ	MS	0.13	0.43	2.1

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD003-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-01

Level (low/med): MED Date Received: 02/07/2011

% Solids: 52.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	3.9			MS	0.69	0.93	0.93
7440-47-3	Chromium	16.7			MS	0.26	0.93	1.9
7782-49-2	Selenium	0.93	U		MS	0.28	0.93	4.7

JMC 4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD004-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-02

Level (low/med): MED Date Received: 02/07/2011

% Solids: 53.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	2.4			MS	0.68	0.92	0.92
7440-47-3	Chromium	12.2			MS	0.26	0.92	1.8
7782-49-2	Selenium	0.92 ~~0.33~~		U MBL	MS	0.28	0.92	4.6

JAC 4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD005-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-03

Level (low/med): MED Date Received: 02/07/2011

% Solids: 61.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	2.2		J OT	MS	0.45	0.61	0.61
7440-47-3	Chromium	12.5		J	MS	0.17	0.61	1.2
7782-49-2	Selenium	0.61	U	UJ	MS	0.18	0.61	3.1

4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD006-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-04

Level (low/med): MED Date Received: 02/07/2011

% Solids: 59.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	4.0		J OT	MS	0.46	0.62	0.62
7440-47-3	Chromium	14.3		J	MS	0.17	0.62	1.2
7782-49-2	Selenium	0.62	~~B~~	W	MS	0.19	0.62	3.1

JAC 4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD006P-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-05

Level (low/med): MED Date Received: 02/07/2011

% Solids: 57.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	4.8		J OT	MS	0.46	0.63	0.63
7440-47-3	Chromium	14.2		J	MS	0.18	0.63	1.3
7782-49-2	Selenium	0.63	~~U~~	UJ	MS	0.19	0.63	3.1

4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD007-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-06

Level (low/med): MED Date Received: 02/07/2011

% Solids: 51.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	1.2		J OT	MS	0.62	0.84	0.84
7440-47-3	Chromium	5.9		J ↓	MS	0.23	0.84	1.7
7782-49-2	Selenium	0.84 ~~0.27~~		~~B~~ UJ MBL	MS	0.25	0.84	4.2

JMC 4811

Comments:

ISM_002 FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD008-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-07

Level (low/med): MED Date Received: 02/07/2011

% Solids: 79.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	1.2		J OT	MS	0.34	0.47	0.47
7440-47-3	Chromium	3.3		J	MS	0.13	0.47	0.93
7782-49-2	Selenium	0.47	~~U~~	UJ	MS	0.14	0.47	2.3

4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD009-0211

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Matrix (soil/water): SOIL Lab Sample ID: K0204-08

Level (low/med): MED Date Received: 02/07/2011

% Solids: 32.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	7.8		J OT	MS	1.0	1.4	1.4
7440-47-3	Chromium	37.0		J ↓	MS	0.39	1.4	2.8
7782-49-2	Selenium	1.4 ~~0.57~~	~~B~~	UJ MBL	MS	0.42	1.4	7.0

JMC 4811

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199301

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 52 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	5280			SP	478	956	1910

VM 041411

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

126

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199304

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 52.7 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	891	U		SP	445	891	1780

VW 040411

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

127

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199305

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 60.7 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	836	~~U~~		SP	418	836	1670

U5,0T

VM 04/4/1

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

128

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199306

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 59.1 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	988	J		SP	412	823	1650

J, OT

WM 040411

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

125

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199307

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 56.6 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	2990			SP	434	869	1740

J,0T

VM 04/14/11

Color Before: Clarity Before: Texture :

Color After : Clarity After: Artifacts:

Comments:

040411 932

136

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199308

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 50.8 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	6430			SP	467	934	1870

JDT

WW 040411

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

131

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD008-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199309

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 78.6 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	1840			SP	295	590	1180

JDT

WW 04411

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

132

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD009-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199310

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 32.1 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	12000			SP	793	1580	3170

IDT

VWW 040411

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

135

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199311

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 61.4 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	1920			SP	387	775	1550

JDT

UW 04411

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

134

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD0011-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199312

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 91.9 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	1740			SP	271	542	1080

J/DT

WW 02/16/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 S32

135

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD0011P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Lab Sample ID: 350199313

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 92 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	2380			SP	260	521	1040

J,0T

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 932

136

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020411

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: WATER Lab Sample ID: 350199314

Level:(low/med) LOW Date Received: 2/7/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.008	J		SP	0.0035	0.007	0.01

J/HT

Color Before: Clarity Before: Texture :

Color After : Clarity After: Artifacts:

Comments:

040411 932

137

PEL

A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3501993

Page 1 of 2

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni / WDC
15010 Conference Center Dr
Suite 205
Chantilly, VA 20151
703-376-5111, michael.zamboni@ch2m.com
Project Mgr.: Bill Hannah / WBC

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 402244. F1. SW. 06 CTO 11
Site Name: SLWMU 6
Location: Ucaques, State: PR
Sampler(s): D. Ballam, J. Martin

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9=_____ 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: VOCs	PAHs	PEST/PCB	Metals	WCHEM	WCHEM(sulfide)	Grain size	AVSSEM
-01-02-03	VWW06-SD003-0211	2/4/11	1025		SO	9	2	14		✓	✓	✓	✓	✓	✓	✓	✓
-04	VWW06-SD004-0211	2/4/11	1105		SO	3	2	6		✓	—	✓	✓	✓	✓	✓	✓
-05	VWW06-SD005-0211		0930		SO	3	2	6		✓	✓	✓	✓	✓	J	✓	✓
-06	VWW06-SD006-0211		0825		SO	3	2	6		✓	✓	✓	✓	✓	✓	✓	✓
-07	VWW06-SD006P-0211		0825			3		4		✓	✓	✓	✓				
-08	VWW06-SD007-0211		0900			3	2	6		✓	✓	✓	✓	✓	✓	✓	✓
-09	VWW06-SD008-0211		0800			3	2	6		✓	J	✓	J	J	J	✓	✓
-10	VWW06-SD009-0211		1000			3	2	7		✓	✓	✓	✓	✓	✓	✓	✓
-11	VWW06-SD010-0211		0945			3	2	6		✓	✓	✓	✓	✓	✓	✓	✓
-12	VWW06-SD011-0211		0735			3	2	6		✓	✓	✓	✓	✓	✓	✓	✓

MS/MSD

☐ E-mail to PFC 8260, 6010
EDD Format _____

Relinquished by:	Received by:	Date:	Time:
		2-7-11	850

Condition upon receipt: ☒ Iced ☐ Ambient ☒ °C 1.1, 10.5, 9.9

3501993

1044

PEL

A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3501993

Page 1 of 2

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni / WDC
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
703-376-5111, michael.zamboni@ch2m.com
Project Mgr.: Bill Hasenach, VBO

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 402422.F1.SW.06
Site Name: SWMU 6
Location: Vieques State: PR
Sampler(s): D. Ballam, J. Martin

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8=$NaHSO_4$ 9=_____ 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	NB 2-7-11	Analyses: VOCs	PAHs	PEST/PCB	Metals	WCHEM	WCHEM (SW846)	grain size	AUSSEM
-13	VWSW06-SD011R-0211	2/4/11	0735		SO	3		4			X	✓	✓	✓				
-14	VWAE-EB01-020411	2/4/11	0630		AQ	3	5		6		✓	✓	✓	✓				
-15	VWAE-TB01-020411	2/4/11	0045		AQ	3					✓							

☐ E-mail to _____
EDD Format _____

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

Relinquished by:	Received by:	Date:	Time:
		2-7-11	850

QA/QC Reporting Level
☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____
State specific reporting standards: _____

3501993

135

1045

FedEx. International Air Waybill
Express

1 From

Date 02/04/11 Sender's FedEx Account Number

Sender's Name Jake Crostic Phone 757 671 6280

Company CH2M Hill

Address Garcia y Camp

Address BIDG 4525

City Vieques State/Province PR

Country USA ZIP/Postal Code 00765

2 To

Recipient's Name John Heyman Phone 813-888-9507

Company PEL Labs - Sample Recovery

Address 8905 Benjamin Rd Dept/Floor

Address Suite A

City Tampa State/Province FL

Country USA ZIP/Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g., GST/RFC/VAT/IN/EIN/ABN, or as locally required.

3 Shipment Information ☐ For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 ☒ lbs ☐ kg DIM L / W / H ☐ in ☐ cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
samples		USA	0

Has EEI/SED been filed in AES? For U.S. Export Only: Check One
☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.
☐ No EEI/SED required, enter exemption number:
☐ Yes – Enter AES proof of filing citation:
If other than NLR, enter License Exception:

Total Declared Value For Carriage

Total Value for Customs (Specify Currency)

4 Express Package Service — Packages up to 150 lbs. / 68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 ☐ FedEx Intl. Priority 6 ☐ FedEx Intl. First — Available to select locations. Higher rates apply.
☐ ____ 3 ☐ FedEx Intl. Economy — FedEx Envelope and FedEx Pak rate not available.

5 Packaging — *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☐ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube
1 ☒ Other cooler PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling
1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery — Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:* — Enter FedEx Acct. No. or Credit Card No. below.
1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check/Cheque
FedEx Acct. No. 186718208 Total Declared Value
Credit Card Exp. Date Specify Currency

7b Payment *Bill duties and taxes to:* — ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance. Enter FedEx Acct. No. below.
1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash/Check/Cheque
FedEx Acct. No. 186718208

8 Your Internal Billing Reference — First 24 characters will appear on invoice.
402244. FW.SW.06

9 Required Signature
Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.
Sender's Signature:
This is not authorization to deliver this shipment without a recipient signature.
Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.
Recipient's Signature:

FedEx Tracking Number 8628 2125 7954 0402

Origin Station ID MMA Destination Station ID TPA JRSA Routing TPA Handling Units Total Volume (cm)
Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☒ Drop Box 4 ☐ World Service Center 5 ☐ Station Forms Attached: ☐
Base Charges FedEx Exp. # 21457 Declared Val. Chrg. Addl. Chrg. # Date Time COD/CPA Credit Card Auth. Del. Courier Emp. # Date

Non-Negotiable International Air Waybill

PART 1 Rev. Dat ©1994-2 PRINTE Form ID No.

140

Express

1 From

Date 02/04/11 Sender's FedEx Account Number

Sender's Name JAKE Crosta Phone 757 671 6286

Company CH2M Hill

Address Camp Garcia

Address BLDG 4325

City Vieques State Province PR

Country USA ZIP Postal Code 00765

2 To

Recipient's Name John Heyman Phone 813-888-9507

Company PCL Labs - Sample Receiving

Address 8405 Benjamin Rd

Dept/Floor

Address Suite A

City Tampa State Province FL

Country USA ZIP Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g. GST/RFC/VAT/IN/EIN/ABN, or as locally required.

3 Shipment Information

☐ For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 ☒ lbs. ☐ kg DIM L / W / H ☐ in. ☐ cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
sample		USA	0
			0

Has EEI/SED been filed in AES? For U.S. Export Only: Check One
☒ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.
☐ No EEI/SED required, enter exemption number:
If other than NLR, enter License Exception:
☐ Yes – Enter AES proof of filing citation:

Total Declared Value for Carriage

Total Value for Customs (Specify Currency)

4 Express Package Service — Packages up to 150 lbs./68 kg
For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

☒ FedEx Intl. Priority
6 ☐ FedEx Intl. First — Available to select locations. Higher rates apply.
☐
3 ☐ FedEx Intl. Economy — FedEx Envelope and FedEx Pak rate not available.

5 Packaging
*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☐ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube
1 ☒ Other cooler PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling
1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery — Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:*
Enter FedEx Acct. No. or Credit Card No. below.
1 ☐ Sender (Acct. No. in Section 1 will be billed.) 2 ☐ Recipient 3 ☒ Third Party 4 ☐ Credit Card 5 ☐ Cash Check/Cheque
1867 18208
FedEx Acct. No. [redacted]
Total Transportation
Credit Card Exp. Date
Specify Currency

7b Payment *Bill duties and taxes to:*
ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.
Enter FedEx Acct. No. below.
1 ☐ Sender (Acct. No. in Section 1 will be billed.) 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash Check/Cheque
FedEx Acct. No. 186718208

8 Your Internal Billing Reference — First 24 characters will appear on invoice.
402244 F1.SW.06

9 Required Signature
Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

FedEx Tracking Number 8607 5366 7853 0402

Origin Station ID NNN Destination Station ID TPAA URSA Routing TPA Handling Units Total Value
Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☒ Drop Box 4 ☐ World Service Center 5 ☐ Station Forms Attached:
Base Charges Declared Val. Chrg. Audit Other ODA/OPA Credit Card Auth.
FedEx Emp. # Emp. # Date 2/4/11 Time Del. Courier Emp. # Date

Non-Negotiable International Air Waybill

PACKAGE LABEL 8607 5366 7853
COMMERCIAL INVOICE LABEL
DELIVERY RECORD LABEL 8607 5366 7853
DELIVERY REATTEMPT LABEL 8607 5366 7853

141

PACKAGE LABEL

1 From

Date 02/07/11 Sender's FedEx Account Number

Sender's Name Jake Crosby Phone 757 61 6286

Company CH2M Hill

Address Camp Garcia

Address BLDG 4525

City Vieques State/Province PR

Country USA ZIP/Postal Code 00765

2 To

Recipient's Name John Heyman Phone 813-828-9507

Company PEL Labs - Sample Receiving

Address 8405 Benjamen Rd Dept/Floor

Address Suite A

City Tampa State/Province FL

Country USA ZIP/Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g. GST/RFC/VAT/IN/EIN/ABN, or as locally required.

3 Shipment Information

For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1

Total Weight 50 lbs kg DIM L / W / H

Commodity Description *DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs *REQUIRED
samples		USA	0
			0

Has EEI/SED been filed in AES? For U.S. Export Only! Check One

☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

☐ No EEI/SED required, enter exemption number:

☐ Yes – Enter AES proof of filing citation:

Total Declared Value for Carriage

If other than NLR, enter License Exception:

Total Value for Customs (Specify Currency) 0

4 Express Package Service

Packages up to 150 lbs./68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 ☐ FedEx Intl. Priority 6 ☐ FedEx Intl. First* Available to select locations. Higher rates apply.

☐ 3 ☐ FedEx Intl. Economy FedEx Envelope and FedEx Pak rate not available.

5 Packaging

*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☐ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube

1 ☐ Other cooler PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling

1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery
Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:*

Enter FedEx Acct. No. or Credit Card No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 4 ☐ Credit Card 5 ☐ Cash Check/Cheque

FedEx Acct. No. 186718208

Credit Card Exp. Date

Total Transportation

Specify Currency

7b Payment *Bill duties and taxes to:*

All shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash Check/Cheque

FedEx Acct. No. 186718208

8 Your Internal Billing Reference

First 24 characters will appear on invoice.

402244. FW. SW. 06

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

FedEx Tracking Number 8607 5366 7864 0402

Origin Station ID | Destination Station ID | USSA Boarding | Handling Units | Total Volume (cm)

Received At: 1 ☐ Reg. Stop 2 ☒ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station

Forms Attached: ☐

Base Charges | Declared Val. for Carr. | Other | C.O.D./D/P | Credit Card Auth.

Pickup Emp. # | Auth Emp # | Date | Time | Del. Courier Emp. # | Date | Time

Non-Negotiable International Air Waybill

52

PART 158 Rev. Date ©1994–20 PRINTED

Form ID No.

142

PEL, a Division of Spectrum Analytical, Inc.

pH LOG SHEET

Work Order # _____ By NA

Client / Project Name _____ Date 2-7-11

PEL Sample Number	H_2SO_4 (pH<2)		HNO_3 (pH<2) 6010		NaOH (pH>12)		ZnAC/NaOH (pH>9)		HCl (pH<2)		Other _____ pH _____	
	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH
01												
02												
03												
04												
05												
06												
07												
08												
09												
10												
11												
12												
13												
14			2	<2					3	<2		
15									3	<2		
16												
17												
18												
19												
20												

3501993

W:\Login\Forms\pH LOG SHEET REV 4.doc

1051

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	3501993	**Req:**	90619
Client:	CH2M Hill	**Project:**	CTO-083 / CTO-111 SWMU 6
Level:	4	**Date Rec'd:**	2/7/2011 8:50:00 AM
Rec'd via:	Fed-Ex	**Due Date:**	2/21/2011

Sample Verification

Samples/Cooler Secure?	Yes	**All Samples on COC accounted For?**	Yes
Temperature of Samples(Celsius)	1.1C-10.5C	**All Samples Rec'd Intact?**	Yes
pH Verified?	Yes	**Sample Vol. Sufficient For Analysis**	Yes
pH WNL?	Yes	**Samples Rec'd W/I Hold Time?**	Yes
Soil Origin (Domestic/Foreign):	Foreign	**Are All Samples to be Analyzed?**	Yes
Site Location/Project on COC?	Yes	**Correct Sample Containers?**	Yes
Client Project # on COC?	Yes	**COC Comments written on COC?**	Yes
Project Mgr. Indicated on COC?	Yes	**Samplers Initials on COC?**	Yes
COC relinquished/Dated by Client?	Yes	**Sample Date/Time Indicated?**	Yes
COC Received/Dated by PEL?	Yes	**TAT Requested:**	STD
Specific Subcontract Indicated?	No	**Client Requests Verbal Results?**	No
Samples Received By	Fed-Ex	**Client Requests Faxed Results?**	No
PEL to Conduct ALL Analyses?	No	**Specific tests noted on COC**	
Radioactivity Check?	No		
COC Present?	Yes		

PEER REVIEW _____

Client: CH2M Hill

WONo: 3501993 Profile Name: Vieques Profile #: 90619

MATRIX S

Sample #	Bottle	Parameter		Check	Received	Date
01	007	6010	Metals	In	Nicole Labus	2/7/2011 6:03:52 PM
01	007	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:15 AM
01	007	6010	Metals	In	Gerson Galvis	2/8/2011 12:57:47 PM
01	007	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:52 PM
01	007	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:03 AM
01	007	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:16 PM
01	007	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:52 PM
01	007	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:09 AM
01	007	7471	Mercury	In	Gerson Galvis	2/9/2011 11:34:59 AM
01	006	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:08 PM
01	006	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:42 AM
01	006	8081	Pesticides	In	Frank Colosi	2/8/2011 4:52:19 PM
01	006	8082	PCB	In	Nicole Labus	2/7/2011 6:02:08 PM
01	006	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:42 AM
01	006	8082	PCB	In	Frank Colosi	2/8/2011 4:52:19 PM
01	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:35 PM
01	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:37 PM
01	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:37 PM
01	009	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:17:51 AM
01	011	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:46 AM
01	001	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:45 PM
01	006	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:42 AM
01	006	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:52:19 PM
01	006	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
01	006	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:32 AM
01	006	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:49:46 PM
01	007	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:52 PM

01	007	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:32 AM
01	007	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:57:49 PM
01	001	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
01	001	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:18:50 AM
01	001	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/24/2011 9:06:23 AM
02	001	6010	Metals	In	Nicole Labus	2/7/2011 6:03:50 PM
02	001	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:20 AM
02	001	6010	Metals	In	Gerson Galvis	2/8/2011 12:57:53 PM
02	001	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:50 PM
02	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:07 AM
02	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:13 PM
02	001	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:50 PM
02	001	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:12 AM
02	001	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:02 AM
02	004	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:04 PM
02	004	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:40 AM
02	004	8081	Pesticides	In	Frank Colosi	2/8/2011 4:52:28 PM
02	004	8082	PCB	In	Nicole Labus	2/7/2011 6:02:04 PM
02	004	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:40 AM
02	004	8082	PCB	In	Frank Colosi	2/8/2011 4:52:28 PM
02	005	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:37 PM
02	007	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:38 PM
02	006	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:38 PM
02	007	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:18:10 AM
02	006	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:02:02 AM
02	003	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:47 PM
02	004	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:40 AM
02	004	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:52:28 PM
02	001	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:50 PM
02	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:35 AM

WONo: 3501993 Profile Name: Vieques Profile #: 90619

02	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:57:53 PM
03	004	6010	Metals	In	Nicole Labus	2/7/2011 6:03:34 PM
03	004	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:23 AM
03	004	6010	Metals	In	Gerson Galvis	2/8/2011 12:57:55 PM
03	004	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:35 PM
03	004	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:10 AM
03	004	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:09 PM
03	004	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:34 PM
03	004	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:17 AM
03	004	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:04 AM
03	001	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:06 PM
03	001	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:43 AM
03	001	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:58 PM
03	001	8082	PCB	In	Nicole Labus	2/7/2011 6:02:06 PM
03	001	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:43 AM
03	001	8082	PCB	In	Frank Colosi	2/8/2011 4:51:58 PM
03	007	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:38 PM
03	005	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:39 PM
03	006	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:40 PM
03	006	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:18:11 AM
03	005	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:02:06 AM
03	003	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:38 PM
03	001	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:43 AM
03	001	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:58 PM
03	004	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:37 PM
03	004	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:36 AM
03	004	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:57:55 PM
04	002	6010	Metals	In	Nicole Labus	2/7/2011 6:03:54 PM
04	002	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:27 AM
04	002	6010	Metals	In	Gerson Galvis	2/8/2011 12:57:57 PM

04	002	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:54 PM
04	002	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:12 AM
04	002	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:42 PM
04	002	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:54 PM
04	002	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:21 AM
04	002	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:05 AM
04	006	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:13 PM
04	006	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:45 AM
04	006	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:56 PM
04	006	8082	PCB	In	Nicole Labus	2/7/2011 6:02:13 PM
04	006	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:45 AM
04	006	8082	PCB	In	Frank Colosi	2/8/2011 4:51:56 PM
04	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:40 PM
04	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:41 PM
04	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:41 PM
04	010	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:17:53 AM
04	009	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:48 AM
04	008	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:42 PM
04	006	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:45 AM
04	006	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:56 PM
04	006	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
04	006	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:35 AM
04	006	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:49:49 PM
04	002	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:54 PM
04	002	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:38 AM
04	002	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:57:57 PM
04	008	SM4500-NH3-G	Ammonia	In	Sample Receipt	2/14/2011 1:50:00 PM
04	008	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:18:20 AM
04	008	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/24/2011 9:06:33 AM
05	006	6010	Metals	In	Nicole Labus	2/7/2011 6:03:45 PM

05	006	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:31 AM
05	006	6010	Metals	In	Gerson Galvis	2/8/2011 12:57:58 PM
05	006	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:45 PM
05	006	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:14 AM
05	006	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:19 PM
05	006	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:45 PM
05	006	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:24 AM
05	006	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:06 AM
05	002	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:00 PM
05	002	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:54 AM
05	002	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:53 PM
05	002	8082	PCB	In	Nicole Labus	2/7/2011 6:02:01 PM
05	002	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:54 AM
05	002	8082	PCB	In	Frank Colosi	2/8/2011 4:51:53 PM
05	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:42 PM
05	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:43 PM
05	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:43 PM
05	011	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:17:55 AM
05	010	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:49 AM
05	003	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:51 PM
05	002	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:54 AM
05	002	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:53 PM
05	002	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
05	002	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:37 AM
05	002	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:49:51 PM
05	006	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:45 PM
05	006	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:39 AM
05	006	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:57:58 PM
05	003	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
05	003	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:18:28 AM

05	003	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/24/2011 9:06:41 AM
06	005	6010	Metals	In	Nicole Labus	2/7/2011 6:04:03 PM
06	005	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:35 AM
06	005	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:00 PM
06	005	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:04:03 PM
06	005	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:17 AM
06	005	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:32 PM
06	005	7471	Mercury	In	Nicole Labus	2/7/2011 6:04:03 PM
06	005	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:28 AM
06	005	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:08 AM
06	002	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:15 PM
06	002	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:50:00 AM
06	002	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:52 PM
06	002	8082	PCB	In	Nicole Labus	2/7/2011 6:02:15 PM
06	002	8082	PCB	Out	Frank Colosi	2/8/2011 8:50:00 AM
06	002	8082	PCB	In	Frank Colosi	2/8/2011 4:51:52 PM
06	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:44 PM
06	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:44 PM
06	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:44 PM
06	011	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:17:56 AM
06	010	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:50 AM
06	001	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:52 PM
06	002	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:50:00 AM
06	002	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:52 PM
06	002	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
06	002	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:39 AM
06	002	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:49:53 PM
06	005	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:04:03 PM
06	005	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:41 AM
06	005	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:00 PM

06	001	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
06	001	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:18:33 AM
06	001	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:32:10 AM
07	001	6010	Metals	In	Nicole Labus	2/7/2011 6:03:58 PM
07	001	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:39 AM
07	001	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:01 PM
07	001	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:58 PM
07	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:19 AM
07	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:39 PM
07	001	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:58 PM
07	001	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:32 AM
07	001	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:10 AM
07	004	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:10 PM
07	004	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:56 AM
07	004	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:38 PM
07	004	8082	PCB	In	Nicole Labus	2/7/2011 6:02:10 PM
07	004	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:56 AM
07	004	8082	PCB	In	Frank Colosi	2/8/2011 4:51:38 PM
07	006	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:46 PM
07	005	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:46 PM
07	007	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:46 PM
07	006	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:17:57 AM
07	005	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:51 AM
07	003	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:30 PM
07	004	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:56 AM
07	004	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:38 PM
07	001	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:58 PM
07	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:44 AM
07	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:01 PM
08	002	6010	Metals	In	Nicole Labus	2/7/2011 6:03:56 PM

08	002	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:42 AM
08	002	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:03 PM
08	002	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:56 PM
08	002	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:21 AM
08	002	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:54 PM
08	002	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:56 PM
08	002	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:35 AM
08	002	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:11 AM
08	006	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:16 PM
08	006	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:53 AM
08	006	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:40 PM
08	006	8082	PCB	In	Nicole Labus	2/7/2011 6:02:16 PM
08	006	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:53 AM
08	006	8082	PCB	In	Frank Colosi	2/8/2011 4:51:40 PM
08	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:47 PM
08	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:47 PM
08	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:48 PM
08	011	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:17:59 AM
08	010	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:52 AM
08	008	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:48 PM
08	006	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:53 AM
08	006	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:40 PM
08	006	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
08	006	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:41 AM
08	006	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:49:55 PM
08	002	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:56 PM
08	002	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:45 AM
08	002	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:03 PM
08	008	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
08	008	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:17:53 AM

08	008	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:32:09 AM
09	001	6010	Metals	In	Nicole Labus	2/7/2011 6:03:48 PM
09	001	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:46 AM
09	001	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:04 PM
09	001	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:48 PM
09	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:23 AM
09	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:50 PM
09	001	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:48 PM
09	001	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:40 AM
09	001	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:13 AM
09	008	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:18 PM
09	008	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:49 AM
09	008	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:42 PM
09	008	8082	PCB	In	Nicole Labus	2/7/2011 6:02:18 PM
09	008	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:49 AM
09	008	8082	PCB	In	Frank Colosi	2/8/2011 4:51:42 PM
09	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:49 PM
09	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:49 PM
09	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:49 PM
09	011	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:18:01 AM
09	010	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:54 AM
09	007	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:49 PM
09	008	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:49 AM
09	008	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:42 PM
09	008	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
09	008	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:42 AM
09	008	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:49:57 PM
09	001	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:48 PM
09	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:46 AM
09	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:04 PM

09	007	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
09	007	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:18:16 AM
09	007	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:32:07 AM
10	001	6010	Metals	In	Nicole Labus	2/7/2011 6:04:00 PM
10	006	6010	Metals	In	Nicole Labus	2/7/2011 6:04:01 PM
10	001	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:50 AM
10	006	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:54 AM
10	001	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:06 PM
10	006	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:10 PM
10	001	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:04:00 PM
10	006	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:04:01 PM
10	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:26 AM
10	006	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:30 AM
10	006	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:45 PM
10	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:56 PM
10	001	7471	Mercury	In	Nicole Labus	2/7/2011 6:04:00 PM
10	006	7471	Mercury	In	Nicole Labus	2/7/2011 6:04:01 PM
10	001	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:43 AM
10	001	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:15 AM
10	007	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:19 PM
10	007	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:47 AM
10	007	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:45 PM
10	007	8082	PCB	In	Nicole Labus	2/7/2011 6:02:19 PM
10	007	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:47 AM
10	007	8082	PCB	In	Frank Colosi	2/8/2011 4:51:45 PM
10	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:50 PM
10	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:50 PM
10	012	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:50 PM
10	010	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:18:02 AM
10	012	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:56 AM

10	009	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:59:00 PM
10	007	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:47 AM
10	007	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:45 PM
10	007	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
10	007	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:44 AM
10	007	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:49:58 PM
10	001	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:04:00 PM
10	006	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:04:01 PM
10	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:48 AM
10	006	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:50 AM
10	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:06 PM
10	006	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:10 PM
10	009	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
10	009	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:18:10 AM
10	009	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:32:05 AM
11	007	6010	Metals	In	Nicole Labus	2/7/2011 6:03:43 PM
11	007	6010	Metals	Out	Gerson Galvis	2/8/2011 5:54:58 AM
11	007	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:08 PM
11	007	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:43 PM
11	007	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:31 AM
11	007	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:47 PM
11	007	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:43 PM
11	007	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:47 AM
11	007	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:17 AM
11	008	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:22 PM
11	008	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:57 AM
11	008	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:47 PM
11	008	8082	PCB	In	Nicole Labus	2/7/2011 6:02:22 PM
11	008	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:57 AM
11	008	8082	PCB	In	Frank Colosi	2/8/2011 4:51:47 PM

11	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:51 PM
11	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:51 PM
11	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:52 PM
11	009	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:18:04 AM
11	011	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:58 AM
11	005	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:56 PM
11	008	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:57 AM
11	008	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:47 PM
11	008	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
11	008	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:46 AM
11	008	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:50:00 PM
11	007	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:43 PM
11	007	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:51 AM
11	007	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:08 PM
11	005	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
11	005	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:18:39 AM
11	005	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:32:03 AM
12	005	6010	Metals	In	Nicole Labus	2/7/2011 6:03:41 PM
12	005	6010	Metals	Out	Gerson Galvis	2/8/2011 5:55:02 AM
12	005	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:12 PM
12	005	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:03:41 PM
12	005	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:35 AM
12	005	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 1:59:58 PM
12	005	7471	Mercury	In	Nicole Labus	2/7/2011 6:03:41 PM
12	005	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:51 AM
12	005	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:20 AM
12	003	8081	Pesticides	In	Nicole Labus	2/7/2011 6:02:23 PM
12	003	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:51 AM
12	003	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:49 PM
12	003	8082	PCB	In	Nicole Labus	2/7/2011 6:02:23 PM

12	003	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:51 AM
12	003	8082	PCB	In	Frank Colosi	2/8/2011 4:51:49 PM
12	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:53 PM
12	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:53 PM
12	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:56 PM
12	011	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:18:06 AM
12	010	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:01:59 AM
12	002	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:58 PM
12	003	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:51 AM
12	003	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:49 PM
12	003	9045	Corosivity - pH	In	Nicole Labus	2/7/2011 11:50:00 AM
12	003	9045	Corosivity - pH	Out	Gerson Galvis	2/11/2011 7:18:47 AM
12	003	9045	Corosivity - pH	In	Gerson Galvis	2/11/2011 12:50:02 PM
12	005	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:03:41 PM
12	005	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:54 AM
12	005	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:12 PM
12	002	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
12	002	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:17:42 AM
12	002	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:32:01 AM
13	002	6010	Metals	In	Nicole Labus	2/7/2011 6:04:05 PM
13	002	6010	Metals	Out	Gerson Galvis	2/8/2011 5:55:06 AM
13	002	6010	Metals	In	Gerson Galvis	2/8/2011 12:58:14 PM
13	002	7196A	Hex Chrom	In	Nicole Labus	2/7/2011 6:04:05 PM
13	002	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 7:19:38 AM
13	002	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:01 PM
13	002	7471	Mercury	In	Nicole Labus	2/7/2011 6:04:05 PM
13	002	7471	Mercury	Out	Gerson Galvis	2/9/2011 9:59:55 AM
13	002	7471	Mercury	In	Gerson Galvis	2/9/2011 11:35:22 AM
13	001	8081	Pesticides	In	Nicole Labus	2/7/2011 6:01:37 PM
13	001	8081	Pesticides	Out	Frank Colosi	2/8/2011 8:49:37 AM

13	001	8081	Pesticides	In	Frank Colosi	2/8/2011 4:51:36 PM
13	001	8082	PCB	In	Nicole Labus	2/7/2011 6:01:38 PM
13	001	8082	PCB	Out	Frank Colosi	2/8/2011 8:49:37 AM
13	001	8082	PCB	In	Frank Colosi	2/8/2011 4:51:35 PM
13	007	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:57 PM
13	006	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:57 PM
13	005	8260	Volatile Organic Compounds	In	Nicole Labus	2/7/2011 6:13:57 PM
13	006	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/9/2011 11:18:08 AM
13	005	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 9:02:01 AM
13	004	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/7/2011 5:58:54 PM
13	001	8270_SIM	GCMS semivolatile SIM	Out	Frank Colosi	2/8/2011 8:49:36 AM
13	001	8270_SIM	GCMS semivolatile SIM	In	Frank Colosi	2/8/2011 4:51:35 PM
13	002	Dry Weight	Dry Weight	In	Nicole Labus	2/7/2011 6:04:05 PM
13	002	Dry Weight	Dry Weight	Out	Gerson Galvis	2/8/2011 5:53:55 AM
13	002	Dry Weight	Dry Weight	In	Gerson Galvis	2/8/2011 12:58:14 PM
13	004	SM4500-NH3-G	Ammonia	In	Nicole Labus	2/14/2011 1:50:00 PM
13	004	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:18:44 AM
13	004	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:31:58 AM

WONo: 3501993 Profile Name: Vieques Profile #: 90619

MATRIX W

Sample #	Bottle	Parameter		Check	Received	Date
14	007	6010	Metals	In	Russell Stallone	2/7/2011 5:56:36 PM
14	007	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:28 PM
14	007	6010	Metals	In	Gerson Galvis	2/8/2011 1:23:40 PM
14	010	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/7/2011 12:00:41 PM
14	010	7196A	Hex Chrom	In	Russell Stallone	2/7/2011 5:56:43 PM
14	010	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 7:58:28 AM
14	007	7470	Mercury	In	Russell Stallone	2/7/2011 5:56:49 PM
14	007	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:42:56 AM
14	007	7470	Mercury	In	Gerson Galvis	2/9/2011 1:19:56 PM
14	005	8081	Pesticides	In	Russell Stallone	2/7/2011 5:57:01 PM
14	004	8081	Pesticides	In	Russell Stallone	2/7/2011 5:57:39 PM
14	005	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:25:58 AM
14	001	8082L	PCB	In	Russell Stallone	2/7/2011 5:57:23 PM
14	004	8082L	PCB	In	Russell Stallone	2/7/2011 5:57:39 PM
14	001	8082L	PCB	Consumed	Devon Thompson	2/9/2011 8:27:14 AM
14	011	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:13:32 AM
14	011	8260	Volatile Organic Compounds	In	Nicole Labus	2/23/2011 6:23:13 PM
14	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/23/2011 6:23:17 PM
14	003	8260	Volatile Organic Compounds	In	Nicole Labus	2/23/2011 6:23:17 PM
14	006	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/7/2011 5:57:31 PM
14	002	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/7/2011 5:57:49 PM
14	002	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/8/2011 8:16:15 AM
14	004	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/8/2011 11:01:16 AM
15	001	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:13:36 AM
15	003	8260	Volatile Organic Compounds	In	Nicole Labus	2/23/2011 6:23:19 PM
15	002	8260	Volatile Organic Compounds	In	Nicole Labus	2/23/2011 6:23:19 PM
15	001	8260	Volatile Organic Compounds	In	Nicole Labus	2/23/2011 6:23:20 PM

Addendum

Letter of Acceptance

Customer Name: CH2M Hill

Date and Time Received: 2/7/2011 8:50:00 AM

Date to be Reported: 3/1/2011

Laboratory Submission Number/SDG: 3501993

Get Detailed Analyte List here: www.pelab.com/webdms/Default.asp?LoaSDG=3501993

Project: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Samples: The submission consisted of 15 samples, including QC, with sample identification shown in the attached data tables.

Tests: The Samples will be analyzed for EPA methods: 6010, 6020OL, 7196A, 7470, 7471, 8081, 8082, 8082L, 8260, 8270_SIM, 9031OL, 9045, ASTM D422_OL, AVS-SEM-ICP_OL, LYDKHN_OL, ORP.

Sample Custody/COC discrepancies:

None.

Notes:

Samples received on 5FEB11 and 7FEB11, client notified. Samples for 6020, Lloyd Khan TOC, 9031 Sulfide, and AVS-SEM analysis will be performed by Mitkem. Samples for Grain Size analysis will be performed by Faulkner.

Distribution of Report to:

CH2M Hill
Attn: Michael Zamboni
(W): 703.376.5301

Note: Submitted material will be retained for 30 days unless otherwise requested by client or consumed in analysis. PEL letters and reports are for the exclusive use of the client to whom they are addressed. Our letters and reports apply to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar materials

Log-in Report

Level: 4 **Total of:** 180 **analyses on** 21 **samples (including QC)** *10-Feb-11*

Report/SDG #: 3501993

Date: 2/10/2011 7:38:40 A

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD003-0211	350199301		S	2/4/2011 10:25:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD003-0211MS	350199302		S	2/4/2011 10:25:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
Dry Weight	Dry Weight	Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD003-0211SD	350199303		S	2/4/2011 10:25:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
Dry Weight	Dry Weight	Dry Weight

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD004-0211	350199304		S	2/4/2011 11:05:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD005-0211	350199305		S	2/4/2011 9:30:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD006-0211	350199306		S	2/4/2011 8:25:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD006P-0211	350199307		S	2/4/2011 8:25:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
Dry Weight	Dry Weight	Dry Weight

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD007-0211	350199308		S	2/4/2011 9:00:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD008-0211	350199309		S	2/4/2011 8:00:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD009-0211	350199310		S	2/4/2011 10:00:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD0010-0211	350199311		S	2/4/2011 9:45:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD0011-0211	350199312		S	2/4/2011 7:35:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD0011P-0211	350199313		S	2/4/2011 7:35:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
Dry Weight	Dry Weight	Dry Weight

11

Report/SDG #: 3501993

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWAE-EB01-020411	350199314		W	2/4/2011 6:30:00 AM	2/7/2011 8:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7470	Mercury	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWAE-TB01-020411	350199315		W	2/4/2011 8:45:00 AM	2/7/2011 8:50:00 AM

Method		
8260	Volatile Organic Compounds	8260

John Heyman [PEL]

From: Michael.Zamboni@CH2M.com
Sent: Monday, February 07, 2011 12:25 PM
To: John Heyman [PEL]; Kevin Dunham [PEL]
Cc: Edward Lawler [Mitkem]; John.Swenfurth@CH2M.com; John.Martin@CH2M.com; dataqual@charter.net; Michael.Zamboni@CH2M.com
Subject: RE: Samples

Just FYI, everyone,

The data validator confirmed that this temperature exceedance will result in usable data (either J/UJ-qualification or no qualification) for SVOC, PEST/PCB, and METAL.

Thanks,
Mike Z.
-----Original Message-----
From: Zamboni, Michael/WDC
Sent: Monday, February 07, 2011 12:11 PM
To: John Heyman [PEL]; Kevin Dunham [PEL]
Cc: Edward Lawler [Mitkem]; Swenfurth, John/TPA; Martin, John/GNV; dataqual@charter.net; Zamboni, Michael/WDC
Subject: RE: Samples

No problem and that is the way it should be, of course! In that case, please do analyze the trip blank because it is as representative as it's supposed to be.

Thanks,
Mike Z.

-----Original Message-----
From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 07, 2011 12:03 PM
To: Zamboni, Michael/WDC; Kevin Dunham [PEL]
Cc: Edward Lawler [Mitkem]; Swenfurth, John/TPA; Martin, John/GNV; dataqual@charter.net
Subject: RE: Samples

Mike:
I apologize for the incorrect information on the 8260 waters. I have verified with our login department that the 8260 vials for the Trip Blank, VWAE-TB01-020411; and the 8260 vials for the Equipment Blank,
VWAE-EB01-020411 were received with the cooler on Saturday.
We are running the hex-chrome sample today.
I will include a copy of this email correspondence in the final report.
Please contact me with any questions or concerns.
Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634
813-888-9507 ext 228

-----Original Message-----
From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Monday, February 07, 2011 11:06 AM
To: John Heyman [PEL]; Kevin Dunham [PEL]
Cc: Edward Lawler [Mitkem]; John.Swenfurth@CH2M.com; Michael.Zamboni@CH2M.com; John.Martin@CH2M.com; dataqual@charter.net
Subject: RE: Samples

Good morning Kevin, thanks for getting this information off to us ASAP!

1. Thank you for verifying that all TerraCores were received on-time and within temperature.
2. Please verify that VWAE-TB01-020411 was not delivered Saturday along with the TerraCores. If this sample was not shipped inside the cooler with the TerraCores, please cancel its analysis. Trip blanks must accompany the sample containers before they are filled and then the samples themselves back to the laboratory.
3. Please go ahead and analyze VWAE-EB01-020411 for aqueous HexCr even though it was received at greater than 2X the holding time. Do me a favor and analyze it ASAP to minimize the exceedance. We know this will likely receive an R-flag if nondetect and may be "barely usable" if detect.
4. Please go ahead and analyze all of the samples. The coolers were received at slightly greater than 2-6 Celsius and I am doubtful that this will result in rejected data for these non-volatile fractions.
Nevertheless, I have a call in with the data validator (copied on this email) to verify that this will result in usable data.
5. Please add a copy of this correspondence to the data package.

Thanks again for all of your help on this project!

Thanks,
Mike Z.

-----Original Message-----
From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 07, 2011 10:29 AM
To: Zamboni, Michael/WDC; Kevin Dunham [PEL]
Cc: Edward Lawler [Mitkem]; Swenfurth, John/TPA
Subject: RE: Samples
Importance: High

Mike:
Good morning. COC attached.
We received all 8260 soil Terracores with the cooler received on Saturday within temp at 1.1C. The Terracores were placed into our freezer on Saturday. The Saturday cooler also contained jars for sample IDs SD003 and SD004.
The 2 coolers received today contained the Equipment Blank, Trip Blank, and the remaining soil jars. The coolers received today had temperatures of 10.5C and 9.9C.
Please advise on how you would like us to proceed with these samples.
Thanks!
John

-----Original Message-----
From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Monday, February 07, 2011 9:40 AM
To: John Heyman [PEL]; Kevin Dunham [PEL]
Cc: Edward Lawler [Mitkem]; John.Swenfurth@CH2M.com; Michael.Zamboni@CH2M.com
Subject: RE: Samples

Hi John H.,

Please hold off on the aqueous HexCr sample. I understand this is just one equipment blank. We may or may not analyze that, but haven't made the decision yet. I know it's already a gross holding time exceedance.

We need to know ASAP, what was in the cooler which arrived on time, what was in the coolers that arrived two days late (i.e. water Terracores?), and what were the temperatures on those two coolers that arrived late.

Once we get all that info, the project team will meet and decide on a path forward. Hold time exceedances are a real bummer because of perception issues; we may need to resample even if analysis would result in data acceptable for other projects.

Thanks,
Mike Z.

174

P.S. Riddle for personal interest: Why was one cooler delivered on time if Saturday delivery wasn't checked off?

-----Original Message-----
From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 07, 2011 9:06 AM
To: Zamboni, Michael/WDC; Kevin Dunham [PEL]
Cc: Edward Lawler [Mitkem]
Subject: RE: Samples
Importance: High

Good morning.
2 coolers from Vieques have arrived this morning. Airbills were not marked for Saturday delivery.
Please advise if you would like us to proceed with the analysis on the hex-chrome waters.
We will check to see if there are any other issues (temp / 8260 soils).
Thanks!
John

-----Original Message-----
From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Saturday, February 05, 2011 11:23 AM
To: Kevin Dunham [PEL]
Cc: Edward Lawler [Mitkem]; John Heyman [PEL]; Michael.Zamboni@CH2M.com
Subject: RE: Samples

Thanks for checking in, Kevin. I forwarded this along but am not really sure where to start with it!

Mike Z.

From: kdunham@pelab.com [kdunham@pelab.com]
Sent: Saturday, February 05, 2011 11:01 AM
To: Zamboni, Michael/WDC
Cc: Ed Lawler; John Heyman
Subject: Fw: Samples

Sent via BlackBerry from T-Mobile

-----Original Message-----
From: kdunham@pelab.com
Date: Sat, 5 Feb 2011 16:00:26
To: John Swenfurth<John.Swenfurth@Ch2m.com>
Reply-To: kdunham@pelab.com
Cc: John Heyman<jheyman@PELAB.com>; Brian Spann<bspann@PELAB.com>; Mark Gudnason<mgudnason@PELAB.com>
Subject: Samples

The samples were not checked for Saturday delivery

They are at airport customs and we cannot pick them up

I believe there are short hold hex cr in the coolers

Kevin
Sent via BlackBerry from T-Mobile

John Heyman [PEL]

From: Vickie.Weber@ch2m.com
Sent: Wednesday, February 09, 2011 5:17 PM
To: John Heyman [PEL]; Michael.Zamboni@CH2M.com
Subject: Vieques SWMU 6 corrections memo
Attachments: CTF_020911_vw.pdf

Hello John,

Please look at the attached corrections memo for updates to the COCs for the samples from Vieques SWMU 6.

Let me know if you have any questions.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 07, 2011 3:23 PM
To: Brynildsen, Victoria/VBO; Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Good to go.
Thanks!
John

From: Vickie.Weber@ch2m.com [mailto:Vickie.Weber@ch2m.com]
Sent: Monday, February 07, 2011 3:22 PM
To: Michael.Zamboni@CH2M.com; John Heyman [PEL]
Subject: RE: LOA and COC for Vieques SWMU 6

Ok...

Sorry about the confusion. The water samples are from 2/3/11 and the field team just wanted me to note that the filtered metals were field filtered as they forgot to include a note about that on the COC.

Let me know if you still have questions.

Vickie

From: Zamboni, Michael/WDC
Sent: Monday, February 07, 2011 3:05 PM
To: Brynildsen, Victoria/VBO; John Heyman [PEL]
Cc: Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Hi Vickie,

Can you please clarify this email? On 2/4/11, there should only be one aqueous sample (besides the trip blank) and it is an equipment blank which should not have been field-filtered for metals.

There were a bunch of aqueous (surface water) samples collected 2/3/11 and they were submitted for both total metals and filtered metals. Those filtered metals were field-filtered.

Thanks,
Mike Z.

From: Brynildsen, Victoria/VBO
Sent: Monday, February 07, 2011 1:55 PM
To: John Heyman [PEL]; Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Hello John,

For Vieques SWMU 6 CTO-111, the Aqueous samples collected on 2/4/11 were field filtered for Metals.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Thursday, February 03, 2011 12:40 PM
To: Zamboni, Michael/WDC
Cc: Brynildsen, Victoria/VBO
Subject: RE: LOA and COC for Vieques SWMU 6

Will do.
Thanks!
John

From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Thursday, February 03, 2011 12:35 PM
To: John Heyman [PEL]
Cc: Victoria.Brynildsen@CH2M.com; Michael.Zamboni@CH2M.com
Subject: RE: LOA and COC for Vieques SWMU 6

Would you please include Vicki on the logins? Files reattached.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Thursday, February 03, 2011 12:33 PM
To: Zamboni, Michael/WDC
Subject: LOA and COC for Vieques SWMU 6

Good afternoon.

3501958

Let me know if anyone else should be on the LOA distribution.

177

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

Corrections to COCs

TO: John Heyman
PEL

COPIES: File
EDD
Data Package

FROM: Victoria Weber
Environmental Information Specialist
CH2M HILL

DATE: February 9, 2011

This memo is to document corrections made to entries on the Chains of Custody (COC) for Vieques SWMU 6, CTO-111.

The following Sample IDs need to be updated.

Correct Sample ID	Incorrect Sample ID	Date	Time
VWW06-EB01-020411	VWAE-EB01-020411	2/4/2011	6:30
VWW06-TB01-020411	VWAE-TB01-020411	2/4/2011	6:45
VWW06-SD001-0211	VWW06-SD01-0211	2/8/2011	11:25
VWW06-SD002-0211	VWW06-SD02-0211	2/8/2011	11:10
VWW06-EB01-020811	VWAE-EB01-020811	2/8/2011	6:00
VWW06-EB02-020811	VWAE-EB02-020811	2/8/2011	6:20
VWW06-TB01-020811	VWAE-TB01-020811	2/8/2011	12:00
VWW06-TB01-020711	VWAE-TB01-020711	2/7/2011	6:00
VWW06-EB01-020711	VWAE-EB01-020711	2/7/2011	6:10
VWW06-EB02-020711	VWAE-EB02-020711	2/7/2011	11:20
VWW06-EB01-020311	VWAE-EB01-020311	2/3/2011	6:30
VWW06-TB04-020311	VWAE-TB04-020311	2/3/2011	11:30

COPYRIGHT 2011 BY CH2M HILL, INC. • COMPANY CONFIDENTIAL

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Thursday, February 17, 2011 3:59 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: Vieques soils 3501993, 3502004 for VOCs method 8260
Importance: High

Mike:

Good afternoon.

Per your conversation with our lab manager, Brian Spann, we will be adding the note below to the 8260 case narrative for SDGs 3501993 and 3502004.

"The samples were re-run due to a computer issue that made the raw data for the original calibration data un-printable for the raw data package. The calibration data was captured by our lims system and is reported in the forms portion of the package. All the samples were re-analyzed and the raw data is reported with the re-analysis. There were some variances in the surrogate recoveries on the re-analysis so both sets of data are reported."

Please contact me with any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:10 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501993-8082-Vieques

Good afternoon.

Please note the following that will appear in the case narrative for method 8082 on SDG 3501993.

A. Surrogates:

All acceptance criteria were met with the exception of:
Sample VWW06-SD0010-0211 was recovered below criteria for the following surrogate(s):
Decachlorobiphenyl at 48.4 % with criteria of (60-125).

Sample VWW06-SD0011P-0211 was recovered above criteria for the following surrogate(s):
Decachlorobiphenyl at 272 % with criteria of (60-125).

Sample VWW06-SD006-0211 was recovered below criteria for the following surrogate(s):
Decachlorobiphenyl at 49.3 % with criteria of (60-125).

Samples coded accordingly. The prep analyst noted matrix issues during the solvent reduction steps. Matrix is the most probable reason for the variances. Since the Lab QC met criteria and matrix was noted, no further action required. The surrogates would have met in house limits.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

181

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:10 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501993-8081-Vieques

Good afternoon.

Please note the following that will appear in the case narrative for method 8081 on SDG 3501993. Let me know if you would like a copy of the Form 8 mentioned below.

A. Calibration:

Note that Form 8 indicates retention time failures. This is only with respect to the front column initial calibration. When the retention time windows are adjusted to the opening CCV of the back column as indicated by the method, all retention time criteria are met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met with the exception of:
Sample VWW06-SD0010-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 49.5 % with criteria of (70-125), Decachlorobiphenyl at 28 % with criteria of (55-130).

Sample VWW06-SD003-0211 was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 150 % with criteria of (70-125).

Sample VWW06-SD003-0211SD was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 141 % with criteria of (70-125).

Sample VWW06-SD004-0211 was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 141 % with criteria of (70-125).

Sample VWW06-SD006-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 54.6 % with criteria of (70-125), Decachlorobiphenyl at 34.6 % with criteria of (55-130).

Sample VWW06-SD007-0211 was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 131 % with criteria of (70-125).

Sample VWW06-SD008-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 62.7 % with criteria of (70-125).

Sample VWW06-SD009-0211 was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 135 % with criteria of (70-125).

The most probable cause of these exceedances is the high content of sulfur in the samples. Copper cleanup was performed, however the sulfur content in the samples was high. Samples coded accordingly.

D. Spikes:

1. Laboratory Control Spikes (LCS)

182

All acceptance criteria were met

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SD003-0211MS was analyzed with the soil samples extracted on 02/08/11. The following analyte(s) were recovered below criteria: Aldrin at 34.6 % with criteria of (45-140), delta-BHC at 36.4 % with criteria of (55-130), Heptachlor at 37.2 % with criteria of (50-140), Heptachlor epoxide at 25 % with criteria of (65-130) and the following analyte (s) were recovered above criteria: 4,4'-DDE at 130 % with criteria of (70-125), alpha-BHC at 159 % with criteria of (60-125), alpha-Chlordane at 394 % with criteria of (65-120).

SD - VWW06-SD003-0211SD was analyzed with the soil samples extracted on 02/08/11. The following analyte(s) were recovered below criteria: Aldrin at 33.6 % with criteria of (45-140), alpha-Chlordane at 63.5 % with criteria of (65-120), delta-BHC at 51.8 % with criteria of (55-130), Heptachlor epoxide at 27.3 % with criteria of (65-130) and the following analyte(s) were recovered above criteria: 4,4'-DDD at 323 % with criteria of (30-135), 4,4'-DDE at 284 % with criteria of (70-125). The following analyte(s) exceeded RPD criteria: 4,4'-DDD at 51.5 % with criteria of (30), 4,4'-DDE at 34.7 % with criteria of (30), alpha-BHC at 58.5 % with criteria of (30), alpha-Chlordane at 143.4 % with criteria of (30), delta-BHC at 36.9 % with criteria of (30), Heptachlor at 37.7 % with criteria of (30).

The most probable cause of these exceedances is the high content of sulfur in the samples. Copper cleaning was performed, however the sulfur content in the samples was high. Samples coded accordingly.

E. Internal Standards:

This method does not require the use of internal standards.

F. Samples:

Sample analysis proceeded normally.
Sample VWW06-SD0010-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD003-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD004-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD005-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD006-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD006P-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD007-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD009-0211 required a 2X dilution due to high concentration of sulfur.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A

Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:11 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501993 / Vieques / 7470

Good afternoon.

Please note the following that will appear in the case narrative for method 7470 on SDG 3501993.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350199703A was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 58.3 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken,

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 09, 2011 7:21 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501993 / Vieques / 6010

Good afternoon.

Please note the following that will appear in the case narrative for method 6010 on SDG 3501993.

1. **Calibration Blanks:**

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB950235 was analyzed on 02/15/11 09:14. The following analyte(s) were detected below RL: Aluminum at 28 UG/L, Barium at 0.376 UG/L, Beryllium at 0.301 UG/L, Iron at 36.7 UG/L, Magnesium at 22.3 UG/L, Manganese at -0.422 UG/L.
CCB950242 was analyzed on 02/15/11 13:26. The following analyte(s) were detected below RL: Aluminum at 14.8 UG/L, Beryllium at 0.135 UG/L, Iron at 12 UG/L, Magnesium at 11.6 UG/L, Manganese at -0.718 UG/L, Nickel at -1.12 UG/L.
CCB950254 was analyzed on 02/15/11 14:23. The following analyte(s) were detected below RL: Aluminum at 15 UG/L, Iron at 10.9 UG/L, Manganese at -0.738 UG/L.
CCB950266 was analyzed on 02/15/11 15:23. The following analyte(s) were detected below RL: Aluminum at 13 UG/L, Beryllium at 0.186 UG/L, Iron at 14.8 UG/L, Magnesium at 11.9 UG/L, Manganese at -0.601 UG/L.

ICB952155 was analyzed on 02/18/11 12:35. The following analyte(s) were detected below RL: Manganese at -1.57 UG/L.
CCB952184 was analyzed on 02/18/11 15:13. The following analyte(s) were detected below RL: Aluminum at 10.9 UG/L, Iron at 5.77 UG/L, Manganese at -2.09 UG/L.
CCB952196 was analyzed on 02/18/11 16:09. The following analyte(s) were detected below RL: Aluminum at 21.6 UG/L, Beryllium at 0.237 UG/L, Iron at 29 UG/L, Magnesium at 10.1 UG/L, Manganese at -1.77 UG/L.
CCB952208 was analyzed on 02/18/11 17:00. The following analyte(s) were detected below RL: Aluminum at 15 UG/L, Beryllium at 0.162 UG/L, Iron at 14.2 UG/L, Magnesium at 9.83 UG/L, Manganese at -1.94 UG/L.
CCB952220 was analyzed on 02/18/11 17:54. The following analyte(s) were detected below RL: Aluminum at 10.1 UG/L, Beryllium at 0.124 UG/L, Iron at 7.36 UG/L, Manganese at -1.68 UG/L.
The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Method Blanks:**

All acceptance criteria were met with the exception of:
Blank 70433MB was analyzed with the soil samples on 02/18/11. The following analyte(s) were detected below RL: Iron at 1880 UG/KG. The hit in the blank is below the RL, therefore, no corrective action was taken.
Samples coded accordingly.

3. **Post Digestion Spike:**

All acceptance criteria were met with the exception of:
Post Digestion Spike 350199703A was analyzed with the water samples on 02/15/11. The following analyte(s) were recovered below criteria: Sodium at 52.1 % with criteria of (80-120). and the following analyte(s) were recovered above criteria: Aluminum at 131.5 % with criteria of (80-120), Beryllium at 126.7 % with criteria of (80-120), Calcium at 125.7 % with criteria of (80-120), Iron at 125.7 % with criteria of (80-120), Magnesium at 128.6 % with criteria of (80-

120), Manganese at 124.4 % with criteria of (80-120), Potassium at 132.8 % with criteria of (80-120), Selenium at 125.9 % with criteria of (80-120), Vanadium at 126.5 % with criteria of (80-120). The PDS is associated with the QC for a different SDG. The LCS/LCSD pass all quality control criteria. No further action was taken.

4. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SD003-0211MS (at a 10X dilution) was analyzed with the soil samples on 02/18/11. The following analyte(s) were recovered below criteria: Antimony at 65.8 % with criteria of (80-120), Calcium at 19.8 % with criteria of (80-120), Manganese at 33.6 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 128.9 % with criteria of (80-120), Copper at 146.2 % with criteria of (80-120), Iron at 225.3 % with criteria of (80-120), Lead at 171.9 % with criteria of (80-120), Magnesium at 121.9 % with criteria of (80-120), Sodium at 154.2 % with criteria of (80-120), Zinc at 306.3 % with criteria of (80-120).

SD - VWW06-SD003-0211SD (at a 10X dilution) was analyzed with the soil samples on 02/18/11. The following analyte(s) were recovered below criteria: Antimony at 58.8 % with criteria of (80-120), Calcium at 0 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 168.1 % with criteria of (80-120), Copper at 492.8 % with criteria of (80-120), Iron at 333.3 % with criteria of (80-120), Lead at 347.8 % with criteria of (80-120), Magnesium at 142.2 % with criteria of (80-120), Manganese at 128.4 % with criteria of (80-120), Nickel at 144.5 % with criteria of (80-120), Sodium at 186.3 % with criteria of (80-120), Vanadium at 129.2 % with criteria of (80-120), Zinc at 573.5 % with criteria of (80-120). The following analyte(s) exceeded RPD criteria: Copper at 55.8 % with criteria of (20). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the parent sample being saturated with Strontium and diluted 10X. The sample required dilutions to get the Internal Standard to pass and required dilutions for Calcium. No further action was taken.
Samples coded accordingly.

B. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350199301L was analyzed with the soil samples on 02/18/11. The following analyte(s) exceeded criteria: Nickel at 48 % with criteria of (10). The most probable cause for the SD exceeding limits is sample matrix due to the parent sample being saturated with Strontium and diluted 10X. The sample required dilutions to get the Internal Standard to pass and required dilutions for Calcium. No further action was taken.
Serial Dilution 350199703L was analyzed with the water samples on 02/15/11. The following analyte(s) exceeded criteria: Aluminum at 82 % with criteria of (10), Barium at 69 % with criteria of (10), Beryllium at 270 % with criteria of (10), Iron at 90 % with criteria of (10), Magnesium at 56 % with criteria of (10). The SD is associated with the QC for a different SDG, therefore, no corrective action was taken.
Samples coded accordingly.

C. Samples:

Sample analysis proceeded normally.

Sample VWW06-SD0010-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium
Sample VWW06-SD0011-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium
Sample VWW06-SD0011P-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD003-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium
Sample VWW06-SD004-0211 required a 10X dilution due to high concentration of the following analyte

(s): Calcium
Sample VWW06-SD005-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium
Sample VWW06-SD006-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium
Sample VWW06-SD006P-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium
Sample VWW06-SD007-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium
Sample VWW06-SD008-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium
Sample VWW06-SD009-0211 required a 10X dilution due to high concentration of the following analyte (s): Calcium

The samples also required a 10X dilution due to the samples being saturated with Strontium causing the Internal Standard to exceed limits. All data reported from the diluted runs with passing Internal Standard.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 09, 2011 7:21 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501993 / Vieques / 7470

Good afternoon.

Please note the following that will appear in the case narrative for method 7470 on SDG 3501993.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350199703A was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 58.3 % with criteria of (80-120). The PDS is associated with the QC for a different SDG. The LCS/LCSD pass all quality control criteria. No further action was taken.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Friday, March 11, 2011 7:58 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501993-8270sim-Vieques

Good afternoon.

Please note the following that will appear in the case narrative for method 8270SIM on SDG 3501993.

I. ANALYSIS

A. **Calibration:**

All acceptance criteria were met.

B. **Blanks:**

All acceptance criteria were met.

C. **Surrogates:**

All acceptance criteria were met with the exception of:
Sample VWW06-SD006P-0211 was recovered above criteria for the following surrogate(s): 2-Fluorobiphenyl at 163 % with criteria of (45-105), p-Terphenyl-d14 at 146 % with criteria of (30-125). The most probable cause is matrix interference. This sample required a 10X dilution for analysis due to the viscosity of the sample extract. At a 10X dilution factor, the surrogate is nearly diluted out.

Sample VWW06-SD008-0211 was recovered below criteria for the following surrogate(s): 2-Fluorobiphenyl at 33.5 % with criteria of (45-105), p-Terphenyl-d14 at 29.4 % with criteria of (30-125). The most probable cause is matrix interference. No further action was taken.

Samples coded accordingly.

D. **Spikes:**

1. **Laboratory Control Spikes (LCS)**

All acceptance criteria were met with the exception of:
LCS 71165LCS was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered below criteria: 1-Methylnaphthalene at 73.6 % with criteria of (77-140).

Samples coded accordingly. Since just one compound was recovered only slightly low, no further action was taken.

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SD003-0211MS was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered above criteria: Acenaphthene at 111 % with

criteria of (45-105), Anthracene at 126 % with criteria of (55-105), Benzo(a)anthracene at 131 % with criteria of (50-110), Benzo(a)pyrene at 117 % with criteria of (50-110), Dibenzo(a,h)anthracene at 129 % with criteria of (45-125), Fluoranthene at 126 % with criteria of (55-115), Naphthalene at 122 % with criteria of (40-105).

SD - VWW06-SD003-0211SD was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered below criteria: 1-Methylnaphthalene at 66.7 % with criteria of (77-140), Benzo(a)pyrene at 0 % with criteria of (50-110), Benzo(b) fluoranthene at 0 % with criteria of (45-115), Benzo(g,h,i)perylene at 0 % with criteria of (40-125), Benzo(k)fluoranthene at 8.9 % with criteria of (15-125), Chrysene at 13.2 % with criteria of (55-110), Fluoranthene at 50 % with criteria of (55-115), Indeno(1,2,3-cd)pyrene at 0.5 % with criteria of (40-120), Phenanthrene at 42.2 % with criteria of (50-110), Pyrene at 16.4 % with criteria of (45-125). The following analyte(s) exceeded RPD criteria: Acenaphthylene at 32.9 % with criteria of (30), Anthracene at 30.5 % with criteria of (30), Benzo(a)anthracene at 33.9 % with criteria of (30), Benzo(a)pyrene at 54.4 % with criteria of (30), Benzo(b)fluoranthene at 45.9 % with criteria of (30), Benzo(g,h,i)perylene at 53.6 % with criteria of (30), Benzo(k)fluoranthene at 36.6 % with criteria of (30), Chrysene at 31.6 % with criteria of (30), Dibenzo(a,h)anthracene at 38.3 % with criteria of (30), Fluoranthene at 35.5 % with criteria of (30), Indeno(1,2,3-cd)pyrene at 53 % with criteria of (30), Phenanthrene at 32.7 % with criteria of (30), Pyrene at 35.3 % with criteria of (30).

Samples coded accordingly. The most probable cause is matrix interference. The parent and MS/MSD all required 5X dilution for analysis due to the viscosity of the sample extract. No further action was taken.

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.
Sample VWW06-SD0010-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD0011-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD0011P-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD003-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD004-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD005-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD006-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD006P-0211 required a 10X dilution due to the viscosity of the sample extract.

Sample VWW06-SD009-0211 required a 5X dilution due to the viscosity of the sample extract.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Monday, March 14, 2011 2:28 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501993 / Vieques / SM4500-NH3-G

Mike:

Good afternoon.

As we discussed on the phone, please note the following for the original run of method SM4500-NH3-G on SDG 3501993. We will rerun these samples out of hold and report both sets of data.

1. **Method Blanks:**

   All acceptance criteria were met with the exception of:
   Blank 71784MB was analyzed with the water samples on 02/16/11. The following analyte(s) were detected below RL: Ammonia at 0.288 MG/KG. The hit in the blank is below the RL, therefore, no corrective action was taken.
   Samples coded accordingly.

B. Spikes:

1. **Laboratory Control Spikes (LCS):**

   All acceptance criteria were met with the exception of:
   LCS 71785LCS was analyzed with the water samples on 02/16/11. The following analyte(s) were recovered above criteria: Ammonia at 119.3 % with criteria of (90-110).

   LCS 71786LCSD was analyzed with the water samples on 02/16/11. The following analyte(s) were recovered above criteria: Ammonia at 118.2 % with criteria of (90-110).

   Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of

the sender or the named addressee(s).

John Heyman [PEL]

From: Michael.Zamboni@CH2M.com
Sent: Thursday, March 31, 2011 7:16 PM
To: John Heyman [PEL]
Cc: Clairette.Campbell@ch2m.com; Troy.Horn@ch2m.com; Michael.Zamboni@CH2M.com
Subject: RE: 7196 soil LOD issue Vieques SWMU6 3501993

John, thanks again for sending this. We still need updated Form 1s for the following samples which belong to SDGs 3502004 and 3502037. I realize that the results won't change, but the LODs will, and they're shown on the Form 1s.

VWW06-SD017-0211
VWW06-SD016-0211
VWW06-SD015-0211
VWW06-SD014-0211
VWW06-SD002-0211*
VWW06-SD001-0211*
VWW06-SD023-0211
VWW06-SD023P-0211
VWW06-SD022-0211
VWW06-SD021-0211
VWW06-SD020-0211
VWW06-SD019-0211
VWW06-SD018-0211

* The LOD might not change for these two samples. Can't tell.

Thanks,
Mike Z.

From: Zamboni, Michael/WDC
Sent: Thursday, March 31, 2011 12:32 PM
To: John Heyman [PEL]
Cc: Campbell, Clairette/VBO; Horn, Troy/VBO; Zamboni, Michael/WDC
Subject: RE: 7196 soil LOD issue Vieques SWMU6 3501993

Hi John,

Thanks for sending this. I don't know what else you've been sending other people. I suspect you sent me these replacement pages since the nondetect results for those two samples changed. However, since all the LODs are incorrect for sediment HexCr, we'll need replacement Form 1s for all the sediment HexCr samples (because the LOD is shown next to the DL and LOQ). Then, the corrected LODs can be used to update (here, on our end), the combined EDD which contains all the data for this site/project.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]

195

Sent: Thursday, March 31, 2011 10:05 AM
To: Zamboni, Michael/WDC
Subject: 7196 soil LOD issue Vieques SWMU6 3501993

Mike:
We have corrected the issues with the adjusted LOD for 7196 soils on 3501993. Attached are Form 1s for the 7196. The non-detect values for 7196 on samples VWW06-SD004-0211 (-04) and VWW06-SD005-0211 (-05) have been adjusted.
Let me know if you would like the report and EDD revised with these values.
Also, I checked all other SDGs for Vieques SWMU6 and there are no other non-detect samples for 7196 soils (3502004 and 3502037).
Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

196

PEL, a Division of Spectrum Analytical, Inc.
8405 Benjamin Rd., Suite A
Tampa, FL 33634
(P) 813-888-9507 (F) 813-889-7128

CHAIN-OF-CUSTODY RECORD

Monday, February 07, 2011 5:47:02 PM

WorkOrder: 3501993

Send to:
Mitkem
175 Metro Center Blvd.
Warwick, RI 02886
Phone: 401-732-3400 FAX:

Project: Vieques
Project Name Vieques/SWMU 6/402244.FI.SW.06 CTO11

Report To: John Heyman, Ext 2
Report Level: 4
Report RLU or MDLU: RL U
J Code results between MDL and RL

K0204

Sample ID	LabID	Collection Date	Date Needed	Mtx	Cont	Requested Tests: 6020	9031	ASTM D422	AVS-SEM-ICP	LYDKHN						Comments
VWW06-SD003-0211	350199301	2/4/2011 10:25:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD003-0211MS	350199302	2/4/2011 10:25:00 AM	2/18/2011	S	1	X										
VWW06-SD003-0211SD	350199303	2/4/2011 10:25:00 AM	2/18/2011	S	1	X										
VWW06-SD004-0211	350199304	2/4/2011 11:05:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD005-0211	350199305	2/4/2011 9:30:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD006-0211	350199306	2/4/2011 8:25:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD006P-0211	350199307	2/4/2011 8:25:00 AM	2/18/2011	S	1	X										
VWW06-SD007-0211	350199308	2/4/2011 9:00:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD008-0211	350199309	2/4/2011 8:00:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD009-0211	350199310	2/4/2011 10:00:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD0010-0211	350199311	2/4/2011 9:45:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD0011-0211	350199312	2/4/2011 7:35:00 AM	2/18/2011	S	1	X	X		X	X						
VWW06-SD0011P-0211	350199313	2/4/2011 7:35:00 AM	2/18/2011	S	1	X										

1 1 1 2 3 4 5 6 7 8 9 10 11

3501993

Comments: DoD

	Date/Time		Date/Time
Relinquished by:	28-11 1720	**Received by:**	SW 2/9/11 2/7/2011 5:47:02 PM
Relinquished by:		**Received by:**	2/9/11 8:45
Relinquished by:		**Received by:**	

4.5°C

0012

723

PEL, a Division of Spectrum Analytical, Inc.
8405 Benjamin Rd., Suite A
Tampa, FL 33634
(P) 813-888-9507 (F) 813-889-7128

CHAIN-OF-CUSTODY RECORD

Monday, February 07, 2011 5:47:02 PM

WorkOrder: 3501993

Send to:
Mitkem
175 Metro Center Blvd.
Warwick, RI 02886
Phone: 401-732-3400 FAX:

Project: Vieques
Project Name Vieques/SWMU 6/402244.FI.SW.06 CTO11

Report To: John Heyman, Ext 2
Report Level: 4
Report RLU or MDLU: RL U
J Code results between MDL and RL

IC-204

Sample ID	LabID	Collection Date	Date Needed	Mtx	Cont	Requested Tests: 6020	9031	ASTM D422	AVS-SEM-ICP	LYDKHN						Comments
17 VWAE-EB01-020411	350199314	2/4/2011 6:30:00 AM	2/18/2011	W	1	X										

3501993

Comments: DOD

	Date/Time		Date/Time
Relinquished by:	28-11 1720	**Received by:**	~~2/7/2011 5:47:02 PM~~ 2/9/11
Relinquished by:		**Received by:**	2/9/11 8:45
Relinquished by:		**Received by:**	

4, 5 °C

MITKEM LABORATORIES
Sample Condition Form

Received By: CW	Reviewed By: RS	Date: 2/9/11	Mitkem Work Order #: K0204
Client Project: Vieques		Client: PEL	

1) Cooler Sealed — Yes / No

2) Custody Seal(s) — Present / Absent; Coolers / Bottles; Intact / Broken

3) Custody Seal Number(s) — NA

4) Chain-of-Custody — Present / Absent

5) Cooler Temperature — 4.5°C

IR Temp Gun ID — MT-1

Coolant Condition — ice

6) Airbill(s) — Present / Absent

Airbill Number(s) — FedEx
4640 0770 0727
4640 0770 0738
—

7) Samples Bottles — Intact / Broken / Leaking

8) Date Received — 2/9/11

9) Time Received — 8:45

Preservative Name/Lot No.:

Lab Sample ID		Preservation (pH) HNO_3	H_2SO_4	HCl	NaOH	H_3PO_4	VOA Matrix	Soil Headspace or Air Bubble ≥ 1/4"
K0204	01							
	02							
	03							
	04							
	05							
	06							
	07							
	08							
	09							
	10							
	11							
K0204	12	<2						

2/9/11

VOA Matrix Key:

US = Unpreserved Soil	A = Air
UA = Unpreserved Aqueous	H = HCl
M = MeOH	E = Encore
N = NaHSO4	F = Freeze

See Sample Condition Notification/Corrective Action Form yes / no

Form ID: QAF.0006

Rad OK yes / no

\\Bernoulli\qa_safety\Controlled Forms\QAF.0006 sample condition form

Shirley Ng [Mitkem]

From: John Heyman [PEL]
Sent: Friday, February 11, 2011 5:11 PM
To: Shirley Ng [Mitkem]; Edward Lawler [Mitkem]
Subject: Vieques sample ID changes

Shirley:
Good afternoon.
Client has a couple of sample ID changes for Vieques samples that we had already sent up to you.

3501993 – PEL ID -14 should be VWW06-EB01-020411 - K0204-12
3501977 – PEL ID -09 should be VWW06-EB02-020311

Prefix was VWAE on the OL COCs and PEDD that we had sent to you.

Let me know if you have any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

Edward Lawler [Mitkem]

From: Edward Lawler [Mitkem]
Sent: Tuesday, February 15, 2011 10:00 AM
To: Heather Anderson Zhao [Mitkem]
Cc: Dawne Smart [Mitkem]
Subject: LK TOC for K0204, K0215

Samples requiring LK-TOC in K0204 and K0215 are sediment, which I suspect may contain elevated levels of TOC. I want to freeze the TOC jar once the analysis is complete (after the analyst takes the portion to dry prior to analysis) in case they decide later on they want to go back and run them using the WB procedure.

Can you let me know when the aliquot for TOC has been taken to dry for these?

Thanks.

--Ed

Edward A. Lawler
Deputy Director for Quality Services, Mitkem Laboratories
a Division of Spectrum Analytical Inc. featuring Hanibal Technology
401-732-3400 x315 401-732-3499 (fax)

This message is intended only for the use of the individual to whom it is addressed and may contain information that is privileged, confidential, and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, or the employee responsible for delivering the message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone at 401-732-3400

USEPA Region II
SW846 Method 8260B VOA

Date: August 2008
SOP: HW-24, Rev. 2

YES NO N/A

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3501993 LAB: PEL

SITE NAME: SWMU6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? ✓ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? ✓ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ✓ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. VOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? ✓ ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? ✓ ___ ___

1.3 Sample Conditions/Problems

201

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ✓ [ ] ___

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R".

All attached sheet ✓

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ".

Sampled 2/4/11 Analy. 2/9+11/11 MM 4/11
Rec'd 2/7/11 Temp 1.1

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? ___ [✓] ___

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

202

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 3501993

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VWW06-SD009-0211	67.9

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	> 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	> 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	> 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water [ ] ___ ___

b. Soil [✓] ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water [ ] ___ ___

b. Soil [✓] ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, section 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. lab [✓] ___ ___

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? [✓] ___ ___

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2 [✓] ___ ___
Sample were analyzed but due due computer issue original calibration data unavailable so sample re-analyzed - Samples were not
If yes, were samples reanalyzed? [ ] ___ ✓
then re-analyzed due to surr
Were method blanks reanalyzed? [ ] ___ ✓
non-compliances.

2A

SOIL VOLATILE ORGANIC SURROGATE RECOVERY

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG NO.: 3501993

Column(1): DB-624 ID: 0.18 (mm)

EPA Sample NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	TOT OUT	
020911BLK22	92.4	95.6	89.4	98.0			0	
020911LCS21	111.0	114.0	98.0	110.0			0	
020911LCS21D	100.0	99.8	88.8	98.8			0	
021711BLK22	93.6	96.4	105.0	91.4			0	
021711LCS21	100.0	103.0	105.0	96.8			0	
021711LCS21D	102.0	106.0	100.0	105.0			0	
VWW06-SD0010-0211	97.6	97.2	108.0	96.2			0	
VWW06-SD0010-0211RE1	100.0	101.0	115.0	97.2			0	
VWW06-SD0011-0211	86.2	88.4	71.0 *	90.8			1	
VWW06-SD0011-0211RE1	91.4	92.2	79.6 *	101.0			1	J/UJ
VWW06-SD0011P-0211	93.4	93.0	86.2	96.2			0	
VWW06-SD0011P-0211RE1	94.8	94.4	86.4	108.0			0	
VWW06-SD003-0211	93.2	96.6	114.0	97.8			0	
VWW06-SD003-0211MS	92.8	95.8	104.0	85.0			0	
VWW06-SD003-0211MSRE1	81.0	75.2 *	59.4 *	81.4			2	
VWW06-SD003-0211RE1	82.6	83.6 *	78.8 *	85.6			2	J/UJ
VWW06-SD003-0211SD	97.4	98.2	101.0	90.2			0	
VWW06-SD003-0211SDRE1	86.6	86.4	80.6 *	78.8			1	
VWW06-SD004-0211	97.6	97.4	113.0	110.0			0	
VWW06-SD004-0211RE1	85.4	81.0 *	74.0 *	97.6			2	J/UJ
VWW06-SD005-0211	103.0	102.0	119.0	104.0			0	
VWW06-SD005-0211RE1	93.6	95.2	104.0	92.6			0	
VWW06-SD006-0211	97.0	99.6	115.0	106.0			0	
VWW06-SD006-0211RE1	83.6	83.8 *	75.6 *	90.4			2	J/UJ

Control Limits

S1	= Dibromofluoromethane	68 -	119
S2	= Toluene d8	85 -	115
S3	= 4-Bromofluorobenzene	85 -	120
S4	= 1,2-Dichloroethane-d4	71 -	124

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out
Control limit source: (lab/method) METHOD

Form II

180311 1923

206

2A

SOIL VOLATILE ORGANIC SURROGATE RECOVERY

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG NO.: 3501993

Column(1): DB-624 ID: 0.18 (mm)

EPA Sample NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	TOT OUT	
VWW06-SD006P-0211	94.0	93.0	111.0	97.6			0	
VWW06-SD006P-0211RE1	102.0	108.0	134.0 *	101.0			1	J
VWW06-SD007-0211	94.6	96.8	96.4	98.8			0	
VWW06-SD007-0211RE1	98.0	94.8	84.2 *	102.0			1	J/UJ
VWW06-SD008-0211	89.0	89.2	71.8 *	105.0			1	
VWW06-SD008-0211RE1	95.2	95.2	95.4	109.0			0	
VWW06-SD009-0211	95.4	99.0	85.8	104.0			0	
VWW06-SD009-0211RE1	107.0	112.0	130.0 *	107.0			1	J

		Control Limits
S1	= Dibromofluoromethane	68 - 119
S2	= Toluene d8	85 - 115
S3	= 4-Bromofluorobenzene	85 - 120
S4	= 1,2-Dichloroethane-d4	71 - 124

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

Control limit source: (lab/method) METHOD

Form II

180311 1923

207

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] ✓ ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Sample(Form III/Equivalent)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. ✓ ___ ___

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

A. Water [✓] ___ ___

B. Soil [ ] ___ ___

C. Med Soil [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ [✓]

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits. [✓] ___ ___

1 of the LCS exhibited a slightly high rec however no ⊕ associated – no qual required

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	**Non-Detected Spiked Compounds**
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

5.0 Matrix Spikes(Form III or equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? ✓ ___ ___

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? ✓ ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

a. Water [✓] ___ ___

b. Waste [ ] ___ ___

c. Soil/Solid [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7)for each matrix. [✓] ___ ___

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [✓] ___ ___

-no % rec out in both MS + MSD

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

-no qual

3

VOLATILE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/4022 VWW06-SD003-0211MSRE1

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC.
Dichlorodifluoromethane	63	0	69	109.0	35 - 135
Chloromethane	63	0	61	97.3	50 - 130
Vinyl chloride	63	0	56	88.9	60 - 125
Bromomethane	63	0	55	87.1	30 - 160
Chloroethane	63	0	54	86.2	40 - 155
Trichlorofluoromethane	63	0	55	87.9	25 - 185
1,1-Dichloroethene	63	0	56	88.1	65 - 135
Carbon disulfide	63	4.0	48	70.2	45 - 160
Methylene chloride	63	0	96	153.0* ✓	55 - 140
trans-1,2-Dichloroethene	63	0	54	85.9	65 - 135
1,1-Dichloroethane	63	0	54	86.0	75 - 125
Acetone	130	81	430	277.0* ✓	20 - 160
cis-1,2-Dichloroethene	63	0	54	85.7	65 - 125
Bromochloromethane	63	0	52	82.2	70 - 125
2-Butanone	130	24	170	113.0	30 - 160
Chloroform	63	0	53	84.6	70 - 125
1,1,1-Trichloroethane	63	0	55	87.6	70 - 135
Carbon tetrachloride	63	0	47	74.9	65 - 135
Benzene	63	0	52	82.9	75 - 125
1,2-Dichloroethane	63	0	51	80.6	70 - 135
Trichloroethene	63	0	48	76.0	75 - 125
1,2-Dichloropropane	63	0	52	82.2	70 - 120
Bromodichloromethane	63	0	50	79.5	70 - 130
cis-1,3-Dichloropropene	63	0	49	77.8	70 - 125
4-Methyl-2-pentanone	130	0	98	77.9	45 - 145
Toluene	63	0	49	78.1	70 - 125
trans-1,3-Dichloropropene	63	0	46	72.9	65 - 125
1,1,2-Trichloroethane	63	0	51	81.1	60 - 125
Tetrachloroethene	63	2.8	53	79.5	65 - 140
2-Hexanone	130	0	110	85.7	45 - 145

no % rec out in both MS and MSD - no qual

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

Form III

180311 1923

3

VOLATILE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

VWW06-SD003-0211MSRE1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/4022

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC.
Dibromochloromethane	63	0	41	65.1	65 - 130
1,2-Dibromoethane(EDB)	63	0	45	71.1	70 - 125
Chlorobenzene	63	0	43	68.4 *	75 - 125
Ethylbenzene	63	0	42	66.2 *	75 - 125
Styrene	63	0	38	61.0 *	75 - 125
Bromoform	63	0	35	54.9 *	55 - 135
Isopropylbenzene (Cumene)	63	0	36	57.5 *	75 - 130
1,1,2,2-Tetrachloroethane	63	0	42	65.9	55 - 130
1,3-Dichlorobenzene	63	0	31	48.6 *	70 - 125
1,4-Dichlorobenzene	63	0	31	49.8 *	70 - 125
1,2-Dichlorobenzene	63	0	28	43.8 *	75 - 120
1,2-Dibromo-3-chloropropane	63	0	29	46.3	40 - 135
1,2,4-Trichlorobenzene	63	0	16	26.0 *	65 - 130
1,2,3-Trichlorobenzene	63	0	14	22.7 *	60 - 135
Xylene (total)	190	0	130	67.7 *	82 - 124
MTBE	63	0	55	86.5	65 - 125
1,1,2-Trichlorotrifluoroethane	63	0	50	78.7	70 - 130
Cyclohexane	63	0	38	61.1 *	70 - 130
Methyl Acetate	63	0	61	96.5	70 - 130
Methyl Cyclohexane	63	0	25	40.3 *	70 - 130

Spike Recovery: 15 out of 50 outside limits

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

Form III

180311.1923

3

VOLATILE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/4 | VWW06-SD003-0211SDRE1

Lab Code : PEL Case No.: ____ SAS No: ____ SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	37	40	110.0	52.3 *	30	35 - 135
Chloromethane	37	36	99.2	51.0 *	30	50 - 130
Vinyl chloride	37	34	93.2	48.3 *	30	60 - 125
Bromomethane	37	33	89.4	50.4 *	30	30 - 160
Chloroethane	37	34	92.9	45.7 *	30	40 - 155
Trichlorofluoromethane	37	35	96.5	44.1 *	30	25 - 185
1,1-Dichloroethene	37	35	94.8	45.8 *	30	65 - 135
Carbon disulfide	37	35	84.2	32.0 *	30	45 - 160
Methylene chloride	37	38	102.0	87.8 *	30	55 - 140
trans-1,2-Dichloroethene	37	32	87.7	50.8 *	30	65 - 135
1,1-Dichloroethane	37	34	93.2	45.2 *	30	75 - 125
Acetone	74	110	42.6	117.3 *	30	20 - 160
cis-1,2-Dichloroethene	37	36	98.4	39.7 *	30	65 - 125
Bromochloromethane	37	32	88.3	46.1 *	30	70 - 125
2-Butanone	74	79	75.1	70.9 *	30	30 - 160
Chloroform	37	33	90.2	46.8 *	30	70 - 125
1,1,1-Trichloroethane	37	35	95.6	44.5 *	30	70 - 135
Carbon tetrachloride	37	33	90.5	34.8 *	30	65 - 135
Benzene	37	34	93.7	41.1 *	30	75 - 125
1,2-Dichloroethane	37	32	88.3	44.2 *	30	70 - 135
Trichloroethene	37	32	88.0	38.9 *	30	75 - 125
1,2-Dichloropropane	37	35	95.4	38.7 *	30	70 - 120
Bromodichloromethane	37	34	92.6	38.3 *	30	70 - 130
cis-1,3-Dichloropropene	37	30	82.8	46.9 *	30	70 - 125
4-Methyl-2-pentanone	74	60	81.5	48.4 *	30	45 - 145
Toluene	37	32	87.2	42.4 *	30	70 - 125
trans-1,3-Dichloropropene	37	28	77.1	47.4 *	30	65 - 125
1,1,2-Trichloroethane	37	29	78.7	55.5 *	30	60 - 125
Tetrachloroethene	37	34	84.7	43.8 *	30	65 - 140
2-Hexanone	74	68	92.0	46.0 *	30	45 - 145

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

Form III

180311 1923

214

3

VOLATILE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/4 VWW06-SD003-0211SDRE1

Lab Code : PEL Case No.: ____ SAS No: ____ SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dibromochloromethane	37	28	76.0	38.0 *	30	65 - 130
1,2-Dibromoethane(EDB)	37	28	77.4	44.8 *	30	70 - 125
Chlorobenzene	37	31	84.7	32.3 *	30	75 - 125
Ethylbenzene	37	32	85.8	27.9	30	75 - 125
Styrene	37	29	78.2	28.9	30	75 - 125
Bromoform	37	25	67.3	33.4 *	30	55 - 135
Isopropylbenzene (Cumene)	37	32	88.0	11.4	30	75 - 130
1,1,2,2-Tetrachloroethane	37	28	75.2	40.2 *	30	55 - 130
1,3-Dichlorobenzene	37	27	73.8	12.1	30	70 - 125
1,4-Dichlorobenzene	37	25	69.2 *	21.1	30	70 - 125
1,2-Dichlorobenzene	37	26	70.3 *	6.7	30	75 - 120
1,2-Dibromo-3-chloropropane	37	20	54.8	36.9 *	30	40 - 135
1,2,4-Trichlorobenzene	37	15	41.1 *	8.3	30	65 - 130
1,2,3-Trichlorobenzene	37	15	40.3 *	3.4	30	60 - 135
Xylene (total)	110	96	87.2	28.7	30	82 - 124
MTBE	37	32	87.7	51.4 *	30	65 - 125
1,1,2-Trichlorotrifluoroethane	37	34	91.6	38.5 *	30	70 - 130
Cyclohexane	37	30	81.2	25.5	30	70 - 130
Methyl Acetate	37	26	72.2	78.6 *	30	70 - 130
Methyl Cyclohexane	37	24	65.1 *	6.1	30	70 - 130

RPD: 39 out of 50 outside limits

Spike Recovery: 5 out of 50 outside limits

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

Form III

180311 1923

215

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD results in conjunction with other QC criteria to determine the need for some qualification.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as well as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determine that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

YES NO N/A

6.0 Blank (CLP Form IV Equivalent)

6.1 Is the Method Blank Summary form present? ☑ ___ ___

6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ☑ ___ ___

6.3 Has a method blank been analyzed for each GC/MS system used ? ☑ ___ ___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject ® all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds? ☑ ___ ___

7.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. [ ] ☑ ___ ___

YES NO N/A

7.2 Do any field/rinse blanks have positive volatile organic compound results? ✓ [ ] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

VWW06 - TB04 - 020411
Methylene Chl 0.87J (1.3)

VWW06 - EB01 - 020411 ND

No qual

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

YES NO N/A

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. ✓ ___ ___

NOTE: For the analysis of volatiles, the method requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? ✓ ___ ___

9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? ✓ ___ ___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? ✓ ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ ✓ ___

9.7 Have the appropriate number of significant figures (two) been reported? ✓ ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. ✓ ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

YES NO N/A

10.0 Target Analytes (CLP Form I Equivalent)

10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate [✓] ___ ___

b. Matrix spikes and matrix spike duplicates [✓] ___ ___

c. Blanks [✓] ___ ___

d. Laboratory Control Samples [✓] ___ ___

10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate [✓] ___ ___

b. Matrix spikes and matrix spike duplicates (Mass spectra not required) [✓] ___ ___

c. Blanks [✓] ___ ___

d. Laboratory Control Samples [✓] ___ ___

ACTION: If any data are missing, take action specified in 3.2 above.

10.3 Is chromatographic performance acceptable with respect to:

Baseline stability? [✓] ___ ___

222

	YES	NO	N/A
Resolution?	☑		
Peak shape?	☑		
Full-scale graph (attenuation)?	☑		

Other:_____

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? ☑

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab for missing spectra.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? ☑

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? ☑

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? ☑

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

NO TICs

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ___ ✓

b. Blanks [ ] ___ ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ✓

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ✓

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ✓ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? ✓ ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC accedence dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? ✓ ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

226

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? ✓ ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39) qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? ✓ ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. ✓ ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? ✓ ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] ✓ ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 GC/MS Calibration Verification (CLP Form VII Equivalent)

YES NO N/A

15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest? [✓] ___ ___

15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2). [ ] [✓] ___

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? ☑ ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? ☑ ___ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit

(Attach additional sheets if necessary.)

ACTION:
1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

2. Do not qualify non-detects when the associated IS are counts area > + 100%.

3. If the IS area is below the lower limit (< -50%), qualify all associated non-detects (U-values) "J".

4. If extremely low area counts are reported (< -25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? ☑ ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? ✓ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

VWW06-SD011-0211
VWW06-SD011P-0211 > See attached sheet

VWW06-SD006-0211
VWW06-SD006P-0211 > See attached sheet

The initial analysis of all field sample were not used in favor of the re-analysis due to a computer problem in which in calibration associated w/ these samples was unable to be reproduced. Therefore the validator was not able to confirm calculations based on this calibration.

DataQual **VOA**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD0011-0211RE
Duplicate Sample ID: VWW06-SD011P-0211RE

Water: RPD>75%
Soil: RPD>100%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
tetrachloroethene		2	200
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: Qualify results as estiamted

Only results above the RL are listed
* one of the results below the RL

DataQual **VOA**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD006-0211RE
Duplicate Sample ID: VWW06-SD006P-0211RE

Water: RPD>75%
Soil: RPD>100%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
acetone	49.8		200
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: Qualify results as estimated

Only results above the RL are listed
* one of the results below the RL

Initial Calibration Date: 2/16/2011

RRF and %RSD Calculations:

Compound Name: vinyl chloride
Lab Value: 0.346

Area of Compound	263933
Area of Internal STD	476845
Conc. of Internal STD	50
Conc. of Compound	80
Calculated RRF	0.346

Compound Name: ethylbenzene
Lab Value: 5.00

RRF of STD 1	0.605
RRF of STD 2	0.643
RRF of STD 3	0.658
RRF of STD 4	0.679
RRF of STD 5	0.684
RRF of STD 6	0.675
RRF of STD 7	0.707
Calculated % RSD	5.0

Continuing Calibration File ID: 2/17/2011

RRF and %D Calculations:

Compound Name: chloromethane
Lab Value: 0.475

Area of Compound	263375
Area of Internal STD	554329
Conc. of Internal STD	50
Conc. of Compound	50
Calculated RRF	0.475

Compound Name: acetone
Lab Value: 16.5

Average RRF	0.185
Calibration Check RRF	0.154
Calculated % D	16.5

SAMPLE CALCULATION

Sample ID: VWW06-SD003-0211RE
Standard ID: 2/16/2011
Compound: acetone
Concnetration: 80.7 ug/Kg

	Water (ug/L)	Soil (ug/Kg)	Soil ug/Kg)
Area of Compound		65090	
Area of Internal STD		462187	
Conc. of Internal (ng)	250	250	
RRF of Compound		0.18483	
Dilution Factor	1	1	
Weight of Sample	NA	4.54	
Volume of Sample	5	NA	
% Moisture	NA	0.52	
Aliquot of sample	NA	NA	
Concentration	#DIV/0!	80.7	#DIV/0!

	RT of Internal STD	RT of Compound	RRT
Sample	7.114	3.045	0.428
Standard	7.114	3.043	0.428

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA 8260B/SW846

IV. PREPARATION

Soil samples were prepared by SW846/5035 for EPA8260B volatiles analysis. All aspects of sample preparation proceeded without exception.

Water samples were prepared by SW846/5030 for EPA8260B volatiles analysis. All aspects of sample preparation proceeded without exception.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met. Please note that:

Blank 021411BLKA32 was analyzed with the water samples on 02/14/11. The following analyte(s) were detected below RL: 1,2,4-Trichlorobenzene at 0.13 UG/L, Acetone at 3.7 UG/L.

No further action was necessary, since the detected hits are below the RL. Samples coded accordingly.

C. Surrogates:

All acceptance criteria were met with the exception of:

Sample VWW06-SD0011-0211 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 71 % with criteria of (85-120). This sample was reanalyzed. See below.

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

Sample VWW06-SD0011-0211RE1 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 79.6 % with criteria of (85-120). No further action was taken. Both sets of data are reported.

Sample VWW06-SD003-0211MSRE1 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 59.4 % with criteria of (85-120), Toluene d8 at 75.2 % with criteria of (85-115).

Sample VWW06-SD003-0211RE1 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 78.8 % with criteria of (85-120), Toluene d8 at 83.6 % with criteria of (85-115).

Sample VWW06-SD003-0211SDRE1 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 80.6 % with criteria of (85-120).

Sample VWW06-SD004-0211RE1 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 74 % with criteria of (85-120), Toluene d8 at 81 % with criteria of (85-115).

Sample VWW06-SD006-0211RE1 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 75.6 % with criteria of (85-120), Toluene d8 at 83.8 % with criteria of (85-115).

Sample VWW06-SD006P-0211RE1 was recovered above criteria for the following surrogate(s): 4-Bromofluorobenzene at 134 % with criteria of (85-120).

Sample VWW06-SD007-0211RE1 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 84.2 % with criteria of (85-120).

Sample VWW06-SD008-0211 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 71.8 % with criteria of (85-120).

Sample VWW06-SD009-0211RE1 was recovered above criteria for the following surrogate(s): 4-Bromofluorobenzene at 130 % with criteria of (85-120).

No further action was taken for the samples that were reanalyzed (RE1). All PW vials were consumed. Samples coded accordingly.

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met. Please note that:

LCS 021711LCS21 was analyzed with the soil samples on 02/17/11. The following analyte(s) were recovered above criteria: Dichlorodifluoromethane at 142 % with criteria of (35-135).

No further action was required, since marginal exceedance criteria were met for this analyte. Samples coded accordingly.

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed. All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

MS - VWW06-SD003-0211MS was analyzed with the soil samples on 02/09/11. The following analyte(s) were recovered below criteria: 1,2,3-Trichlorobenzene at 42.7 % with criteria of (60-135), 1,2,4-Trichlorobenzene at 46.3 % with criteria of (65-130), Acetone at 0 % with criteria of (20-160).

MS - VWW06-SD003-0211MSRE1 was analyzed with the soil samples on 02/17/11. The following analyte(s) were recovered below criteria: 1,2,3-Trichlorobenzene at 22.7 % with criteria of (60-135), 1,2,4-Trichlorobenzene at 26 % with criteria of (65-130), 1,2-Dichlorobenzene at 43.8 % with criteria of (75-120), 1,3-Dichlorobenzene at 48.6 % with criteria of (70-125), 1,4-Dichlorobenzene at 49.8 % with criteria of (70-125), Bromoform at 54.9 % with criteria of (55-135), Chlorobenzene at 68.4 % with criteria of (75-125), Cyclohexane at 61.1 % with criteria of (70-130), Ethylbenzene at 66.2 % with criteria of (75-125), Isopropylbenzene (Cumene) at 57.5 % with criteria of (75-130), Methyl Cyclohexane at 40.3 % with criteria of (70-130), Styrene at 61 % with criteria of (75-125), Xylene (total) at 67.7 % with criteria of (82-124) and the following analyte(s) were recovered above criteria: Acetone at 277 % with criteria of (20-160), Methylene chloride at 153 % with criteria of (55-140).

SD - VWW06-SD003-0211SD was analyzed with the soil samples on 02/09/11. The following analyte(s) were recovered below criteria: 1,2,3-Trichlorobenzene at 32 % with criteria of (60-135), 1,2,4-Trichlorobenzene at 41.7 % with criteria of (65-130) and the following analyte(s) were recovered above criteria: Acetone at 236 % with criteria of (20-160). The following analyte(s) exceeded RPD criteria: 1,1,1-Trichloroethane at 117.7 % with criteria of (30), 1,1,2,2-Tetrachloroethane at 121.4 % with criteria of (30), 1,1,2-Trichloroethane at 115.4 % with criteria of (30), 1,1,2-Trichlorotrifluoroethane at 114.3 % with criteria of (30), 1,1-Dichloroethane at 111.7 % with criteria of (30), 1,1-Dichloroethene at 111.7 % with criteria of (30), 1,2,3-Trichlorobenzene at 93.6 % with criteria of (30), 1,2,4-Trichlorobenzene at 107.3 % with criteria of (30), 1,2-Dibromo-3-chloropropane at 94.1 % with criteria of (30), 1,2-Dibromoethane(EDB) at 119.2 % with criteria of (30), 1,2-Dichlorobenzene at 113.9 % with criteria of (30), 1,2-Dichloroethane at 115 % with criteria of (30), 1,2-Dichloropropane at 112.2 % with criteria of (30), 1,3-Dichlorobenzene at 116.5 % with criteria of (30), 1,4-Dichlorobenzene at 116 % with criteria of (30), 2-Butanone at 123.9 % with criteria of (30), 2-Hexanone at 109.5 % with criteria of (30), 4-Methyl-2-pentanone at 119.7 % with criteria of (30), Acetone at 134.2 % with criteria of (30), Benzene at 114.7 % with criteria of (30), Bromochloromethane at 119.6 % with criteria of (30), Bromodichloromethane at 115 % with criteria of (30), Bromoform at 118.5 % with criteria of (30), Bromomethane at 106.5 % with criteria of

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

(30), Carbon disulfide at 104.5 % with criteria of (30), Carbon tetrachloride at 113.4 % with criteria of (30), Chlorobenzene at 116.6 % with criteria of (30), Chloroethane at 106.1 % with criteria of (30), Chloroform at 116.5 % with criteria of (30), Chloromethane at 113.5 % with criteria of (30), cis-1,2-Dichloroethene at 111.6 % with criteria of (30), cis-1,3-Dichloropropene at 114.4 % with criteria of (30), Cyclohexane at 121.1 % with criteria of (30), Dibromochloromethane at 110 % with criteria of (30), Dichlorodifluoromethane at 114.9 % with criteria of (30), Ethylbenzene at 114.4 % with criteria of (30), Isopropylbenzene (Cumene) at 115.9 % with criteria of (30), Methyl Acetate at 136.1 % with criteria of (30), Methyl Cyclohexane at 123.5 % with criteria of (30), Methylene chloride at 116.1 % with criteria of (30), MTBE at 118.3 % with criteria of (30), Styrene at 115.9 % with criteria of (30), Tetrachloroethene at 112.9 % with criteria of (30), Toluene at 114.4 % with criteria of (30), trans-1,2-Dichloroethene at 109.4 % with criteria of (30), trans-1,3-Dichloropropene at 115.8 % with criteria of (30), Trichloroethene at 113 % with criteria of (30), Trichlorofluoromethane at 115.3 % with criteria of (30), Vinyl chloride at 113.3 % with criteria of (30), Xylene (total) at 116 % with criteria of (30).

SD - VWW06-SD003-0211SDRE1 was analyzed with the soil samples on 02/17/11. The following analyte(s) were recovered below criteria: 1,2,3-Trichlorobenzene at 40.3 % with criteria of (60-135), 1,2,4-Trichlorobenzene at 41.1 % with criteria of (65-130), 1,2-Dichlorobenzene at 70.3 % with criteria of (75-120), 1,4-Dichlorobenzene at 69.2 % with criteria of (70-125), Methyl Cyclohexane at 65.1 % with criteria of (70-130). The following analyte(s) exceeded RPD criteria: 1,1,1-Trichloroethane at 44.5 % with criteria of (30), 1,1,2,2-Tetrachloroethane at 40.2 % with criteria of (30), 1,1,2-Trichloroethane at 55.5 % with criteria of (30), 1,1,2-Trichlorotrifluoroethane at 38.5 % with criteria of (30), 1,1-Dichloroethane at 45.2 % with criteria of (30), 1,1-Dichloroethene at 45.8 % with criteria of (30), 1,2-Dibromo-3-chloropropane at 36.9 % with criteria of (30), 1,2-Dibromoethane(EDB) at 44.8 % with criteria of (30), 1,2-Dichloroethane at 44.2 % with criteria of (30), 1,2-Dichloropropane at 38.7 % with criteria of (30), 2-Butanone at 70.9 % with criteria of (30), 2-Hexanone at 46 % with criteria of (30), 4-Methyl-2-pentanone at 48.4 % with criteria of (30), Acetone at 117.3 % with criteria of (30), Benzene at 41.1 % with criteria of (30), Bromochloromethane at 46.1 % with criteria of (30), Bromodichloromethane at 38.3 % with criteria of (30), Bromoform at 33.4 % with criteria of (30), Bromomethane at 50.4 % with criteria of (30), Carbon disulfide at 32 % with criteria of (30), Carbon tetrachloride at 34.8 % with criteria of (30), Chlorobenzene at 32.3 % with criteria of (30), Chloroethane at 45.7 % with criteria of (30), Chloroform at 46.8 % with criteria of (30), Chloromethane at 51 % with criteria of (30), cis-1,2-Dichloroethene at 39.7 % with criteria of (30), cis-1,3-Dichloropropene at 46.9 % with criteria of (30), Dibromochloromethane at 38 % with criteria of (30), Dichlorodifluoromethane at 52.3 % with criteria of (30), Methyl Acetate at 78.6 % with criteria of (30), Methylene chloride at 87.8 % with criteria of (30), MTBE at 51.4 % with criteria of (30), Tetrachloroethene at 43.8

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

% with criteria of (30), Toluene at 42.4 % with criteria of (30), trans-1,2-Dichloroethene at 50.8 % with criteria of (30), trans-1,3-Dichloropropene at 47.4 % with criteria of (30), Trichloroethene at 38.9 % with criteria of (30), Trichlorofluoromethane at 44.1 % with criteria of (30), Vinyl chloride at 48.3 % with criteria of (30).

No further action was taken. All parent, MS and SD samples are reported. Samples coded accordingly.

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

The soil samples were re-run due to a computer issue that made the raw data for the original calibration data un-printable for the raw data package. The calibration data was captured by our lims system and is reported in the forms portion of the package. All the samples were re-analyzed after the instrument was recalibrated and the raw data is reported with the re-analysis. The recalibration chromatograms are available in the raw data package. There were some variances in the surrogate recoveries on the re-analysis so both sets of data are reported. No further action was taken, since both sets of low level PW vials were consumed.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Lisa Pelo Title: VOA Manager

SIGNED: **DATE:** 03/02/2011

YES NO N/A

E - The concentration of this analyte exceeds the calibration range of the instrument.

A - Indicates a Tentatively Identified Compound (TIC) is a suspected adol-condensation product.

X,Y,Z- Laboratory defined flags. The data reviewer must change these qualifiers during validation so that the data user may understand their impact on the data.

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3501993 LAB: PEL

SITE NAME: SWMU6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format? Y ___ ___

ACTION: If not, note the effect on review of the data in the data assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? Y ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? Y ___ ___

242

YES NO N/A

II. SEMIVOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? ☑ ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ☑ ___ ___

Samples SD003 + SD004 temp 0.1°C — No qual

SAP req. 4°C ± 2°C

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, all non-detects data are qualified as unusable (R), and detects are flagged "J".

Temp 9.9-10°C for 2 days

ACTION: If samples were not iced, or if the ice was melted upon arrival at the laboratory and the cooler temperature was elevated (10°C), flag all positive results "J" and all non-detects "UJ".

Sampled 2/4/11 Ext'd 2/8-11/11 J/UJ

2.0 Holding Times

Recd 2/7/11 Analy 2/9-3/10/11

2.1 Have any semivolatile technical holding times, determined from date of collection to date of extraction, been exceeded? ___ ☑ ___

Continuous extraction of water samples for semivolatile analysis must be started within 7 days of the date of collection. Soil/sediment samples must be extracted within 14 days of collection. Extracts must be analyzed within

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 3501993

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VWW06-SD009-0211	67.9

YES NO N/A

40 days of the date of extraction.

Table of Holding Time Violations

(See Traffic Report)

Sample ID	Sample Matrix	Date Sampled	Date Lab Received	Date Extracted	Date Analyzed

ACTION: If technical holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

	YES	NO	N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Have the semi volatile surrogate recoveries been listed on CLP Surrogate Recovery forms (Form II) for each of the following matrices:

a.	Low Water	[ ]	___	___
b.	Low/Med Soil	[✓]	___	___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery Summary forms for each matrix:

a.	Low Water	[ ]	___	___
b.	Low/Med Soil	[✓]	___	___

ACTION: If CLP deliverables are unavailable, document the effect(s) in data assessments. In some cases the lab may have to be contacted to obtain the data necessary to complete the validation.

3.3 Were outliers marked correctly with an asterisk? [✓] ___ ___

ACTION: Circle all outliers in red.

3.4 Were two or more base neutral OR acid surrogate recoveries out of specification for any sample or method blank (Reviewer should use lab in house recovery limits. Use surrogate recovery limits from USEPA National Functional Guidlines January 2005 page 130, if in house limits are not available. See Method 8000B-43 or 80000C-24). [✓] ___ ___

Note: Examine lab in house limits for reasonableness.

If yes, were samples re-analyzed? [ ] ___ ✓

2A

SOIL SEMI-VOLATILE ORGANIC SURROGATE RECOVERY

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG NO.: 3501993

Column(1): HPMS-5 ID: 0.25 (mm)

EPA Sample NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	TOT OUT
71164MB	105.0	96.8					0
71165LCS	94.8	93.6					0
VWW06-SD0010-0211	69.4	71.6					0
VWW06-SD0011-0211	81.2	82.6					0
VWW06-SD0011P-0211	78.9	84.5					0
VWW06-SD003-0211	76.0	76.3					0
VWW06-SD003-0211MS	98.9	97.1					0
VWW06-SD003-0211SD	73.4	77.4					0
VWW06-SD004-0211	92.1	88.3					0
VWW06-SD005-0211	66.8	74.9					0
VWW06-SD006-0211	83.7	85.8					0
VWW06-SD006P-0211	146.0 *	163.0 *					2
VWW06-SD007-0211	78.0	82.5					0
VWW06-SD008-0211	29.4 *	33.5 *					2
VWW06-SD009-0211	67.6	70.0					0

1:10 J

J/UJ

Control Limits

S1	= p-Terphenyl-d14	30 - 125
S2	= 2-Fluorobiphenyl	45 - 105

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

Control limit source: (lab/method) METHOD

Form II

180311 1923

	YES	NO	N/A
Were method blanks re-analyzed?	[ ]	___	✓

ACTION: If all surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet method specifications, <u>for the affected fraction only (i.e. either base-neutral or acid compounds):</u>

1. Flag all positive results as estimated ("J").

2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.

3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any base-neutral <u>or</u> acid surrogate has a recovery of < 10%:

1. Positive results for the fraction with < 10% surrogate recovery are qualified with "J".

2. Non-detects for that fraction should be qualified as unusable (R) .

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

3.5 Are there any transcription/calculation errors between raw data and Form II?	___	✓ [ ]	___

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and document

YES NO N/A

effect in data assessments.

4.0 Matrix Spikes (Form III/Equivalent)

4.1 Have the semivolatile Matrix Spike and Matrix Spike Duplicate/or duplicate unspiked Sample recoveries been listed on the Recovery Form (Form III)? [✓] ___ ___

NOTE: Method 3500B/page 4 states the spiking compounds:

Base/neutrals	Acids
1,2,4-Trichlorobenzene	Pentachlorophenol
Acenaphthene	Phenol
2,4-Dinitrotoluene	2-Chlorophenol
Pyrene	4-Chloro-3-methylphenol
N-Nitroso-di-n-propylamine	4-Nitrophenol
1,4-Dichlorobenzene	

Note: Some projects may require the spiking of specific compounds of interest.

Note: See Method 8270D-sec 8.4.2 for deciding on whether to prepare and analyze duplicate samples or a martix spike/matrix spike duplicate. If samples are expected to contain target analytes, then laboratory may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, laboratory should use a matrix spike and matrix spike duplicate pair.

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [ ] ___ ___

b. Low Solid [ ] ___ ___

c. Med Solid [✓] ___ ___

YES NO N/A

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above. It may be necessary to contact the lab to obtain the required data.

NOTE: If the data has not been reported on CLP equivalent form, then the laboratory must provide the information necessary to evaluate the spike recoveries in the MS and MSD. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

4.3 Were matrix spikes performed at concentration equal to 100ug/L for acid compounds, and 200ug/l for base compounds (Method 3500B-4), or those specified in project plan. ☑ ___ ___

4.4 How many semivolatile spike recoveries are outside Laboratory in house MS/MSD recovery limits (use recovery limits values in Method 8270D-43&44 Table 6 if in house values not available).

Water

____ out of ____

Solids

17 out of 36

3

SEMI-VOLATILE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

VWW06-SD003-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/4022

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC.
1-Methylnaphthalene	38	0	30	78.8	77 - 140
2-Methylnaphthalene	38	0	40	105.0	45 - 105
Acenaphthene	38	0	42	111.0* ✓	45 - 105
Acenaphthylene	38	0	40	107.0	45 - 110
Anthracene	38	0	48	126.0* ✓	55 - 105
Benzo(a)anthracene	38	40	89	131.0* ✓	50 - 110
Benzo(a)pyrene	38	78	120	117.0*	50 - 110
Benzo(b)fluoranthene	38	120	170	111.0	45 - 115
Benzo(g,h,i)perylene	38	60	99	103.0	40 - 125
Benzo(k)fluoranthene	38	40	62	59.8	15 - 125
Chrysene	38	50	75	66.9	55 - 110
Dibenzo(a,h)anthracene	38	0	49	129.0* ✓	45 - 125
Fluoranthene	38	49	97	126.0*	55 - 115
Fluorene	38	0	40	106.0	50 - 110
Indeno(1,2,3-cd)pyrene	38	50	87	97.4	40 - 120
Naphthalene	38	0	46	122.0* ✓	40 - 105
Phenanthrene	38	27	59	85.7	50 - 110
Pyrene	38	67	100	99.5	45 - 125

Spike Recovery: 7 out of 18 outside limits

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

_____

Form III

180311 1923

251

3

SEMI-VOLATILE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

VWW06-SD003-0211SD

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/4

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1-Methylnaphthalene	37	25	66.7 *	18.3	30	77 - 140
2-Methylnaphthalene	37	30	80.9	27.3	30	45 - 105
Acenaphthene	37	34	91.9	20.7	30	45 - 105
Acenaphthylene	37	29	78.0	32.9 *	30	45 - 110
Anthracene	37	35	94.1	30.5 *	30	55 - 105
Benzo(a)anthracene	37	63	63.4	33.9 *	30	50 - 110
Benzo(a)pyrene	37	70	0.0 *	54.4 *	30	50 - 110
Benzo(b)fluoranthene	37	100	0.0 *	45.9 *	30	45 - 115
Benzo(g,h,i)perylene	37	57	0.0 *	53.6 *	30	40 - 125
Benzo(k)fluoranthene	37	43	8.9 *	36.6 *	30	15 - 125
Chrysene	37	54	13.2 *	31.6 *	30	55 - 110
Dibenzo(a,h)anthracene	37	33	89.0	38.3 *	30	45 - 125
Fluoranthene	37	68	50.0 *	35.5 *	30	55 - 115
Fluorene	37	30	81.5	27.8	30	50 - 110
Indeno(1,2,3-cd)pyrene	37	51	0.5 *	53.0 *	30	40 - 120
Naphthalene	37	36	97.0	24.8	30	40 - 105
Phenanthrene	37	43	42.2 *	32.7 *	30	50 - 110
Pyrene	37	74	16.4 *	35.3 *	30	45 - 125

RPD: 13 out of 18 outside limits

Spike Recovery: 10 out of 18 outside limits

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

_____

Form III

180311 1023

252

YES NO N/A

4.5 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Solids
____ out of ____	13 out of 18

ACTION: Circle all outliers with red pencil.

ACTION: No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the matrix spike and matrix spike duplicate results in conjunction with other QC criteria to determine the need for some qualification of the data.

4.6 Was a Laboratory Control Sample (LCS) analyzed with each analytical batch? ✓ ___ ___

NOTE: When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

5.0 Blanks (Form IV/Equivalent)

5.1 Is the Method Blank Summary (Form IV) present? ✓ ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported per 20 samples of similar matrix, or concentration level, and for each extraction batch? ✓ ___ ___

5.3 Has a method blank been analyzed either after

	YES	NO	N/A
the calibration standard or at any other time during the analytical shift for each GC/MS system used ?	✓		

ACTION: If any method blank data are missing, call lab for explanation/resubmittal. If not available, use professional judgement to determine if the associated sample data should be qualified.

5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra. Is the chromatographic performance (baseline stability) for each instrument acceptable for the semivolatiles?	✓		

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.		✓	
6.2 Do any field/rinse/ blanks have positive results for target analytes and/or TICs (if required, see section 10 below)?		✓	

YES NO N/A

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks. If gross contamination exists, all data in the associated samples should be qualified as unusable (R).

VWW06-EB01-020411 MO⊕

YES NO N/A

Blank Action for Semivolatile Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification required
	< CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	= CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report concentration of sample with a U
		≥ CRQL and ≥ blank contamination	No qualification required

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: If the laboratory did not report TIC analyses, check the project plans to verify whether or not it was required.

6.3 Are there field/rinse/equipment blanks associated with every sample? [✓] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

6.4 Was a instrument blank analyzed after each sample/dilution which contained a target compound

256

	YES	NO	N/A
that exceeded the initial calibration range.	[ ]	___	✓
6.5 Does the instrument blank have positive results for target analytes and/or TICs?	___	[ ]	✓

Note: Use professional judgement to determine if carryover occurred and qualify analytes accordingly.

7.0 GC/MS Apparatus and Materials

7.1 Did the lab use the proper gas chromatographic column for analysis of semivolatiles by Method 8270D? Check raw data, instrument logs or contact the lab to determine what type of column was used. The method requires the use of 30 m x 0.25 mm ID (or 0.32 mm ID), silicone-coated, fused silica, capillary column.	✓	___	___

ACTION: If the specified column, or equivalent, was not used, document the effects in the data assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (Form V/Equivalent)

8.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for decafluorotriphenylphosphine (DFTPP)?	✓	___	___

NOTE: The performance solution should also contain 4,4-DDT, pentachlorophenol, and benzidine to verify injection port inertness and column performance. The degradation of DDT to DDE and DDD must be less than 20% total and the response of pentachlorophenol and benzidine should be within normal ranges for these compounds (based upon lab experience) and show no peak degradation or tailing before samples are analyzed. (see section 5.5

YES NO N/A

page 8270D-12).

8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? ✓ ___ ___

8.3 Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument? ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable (R).

8.4 Have the ion abundances been normalized to m/z 198? ✓ ___ ___

8.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

	YES	NO	N/A
ACTION: If ion abundance criteria are not met, take action specified in section 3.2			
8.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.)		✓	
8.7 Have the appropriate number of significant figures (two) been reported?	✓		
ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document effect in data assessments.			
8.8 Are the spectra of the mass calibration compound acceptable?	✓		
ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			
9.0 Target Analytes			
9.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates	✓		
c. Blanks	✓		
9.2 Has any special cleanup, such as GPC, been performed on all soil/sediment sample extracts (see section 7.2, page 8270D-14)?		✓	

	YES	NO	N/A

ACTION: If data suggests that extract cleanup was not performed, use professional judgement. Make note in the data assessment narrative.

9.3 Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate	☑		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	☑		
c. Blanks	☑		

ACTION: If any data are missing, take action specified in 3.2 above.

9.4 Are the response factors shown in the Quant Report?	☑		
9.5 Is chromatographic performance acceptable with respect to:			
Baseline stability?	☑		
Resolution?	☑		
Peak shape?	☑		
Full-scale graph (attenuation)?	☑		
Other:_____	☐		

ACTION: Use professional judgement to determine the acceptability of the data.

9.6 Are the lab-generated standard mass spectra of identified semivolatile compounds present for

	YES	NO	N/A
each sample?	✓		

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the data assessment narrative. If spectra are missing, reject all positive data.

9.7 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	✓		
9.8 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?	✓		
9.9 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum?	✓		

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R), flagged "N" (Presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 9.7, 9.8, and 9.9.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

	YES	NO	N/A

10.0 Tentatively Identified Compounds (TIC)

10.1 If Tentatively Identified Compounds were required for this project, are all Form Is, Part B present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier? NO TICs

NOTE: Review sampling reports to determine if the lab was required to identify non target analytes (refer to section 7.6.2,page 8270D-21).

10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following: [ ] ___ ___ ✓

a. Samples and/or fractions as appropriate [ ] ___ ___ ✓

b. Blanks [ ] ___ ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by CAS #.

10.3 Are any target compounds from one fraction listed as TIC compounds in another (e.g., an acid compound listed as a base neutral TIC)? ___ [ ] ___ ✓

ACTION: i. Flag with "R" any target compound listed as a TIC.

ii. Make sure all rejected compounds are properly reported in the other fraction.

10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the

	YES	NO	N/A
sample mass spectrum?	[ ]	___	✓
10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%?	[ ]	___	✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate and remove "JN". Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R."

11.0 Compound Quantitation and Reported Detection Limits

	YES	NO	N/A
11.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	✓ [ ]	___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

	YES	NO	N/A
11.2 Are the method detection limits adjusted to reflect sample dilutions and, for soils, sample moisture?	✓ [ ]	___	___

YES NO N/A

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original Form I (if present) and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red " X" across the entire page of all Form I's that should not be used, including any in the summary package.

12.0 Standards Data (GC/MS)

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant, Reports) present for initial and continuing calibration? ✓ ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

13.0 GC/MS Initial Calibration (Form VI/Equivalent)

13.1 Is the Initial Calibration Form (Form VI/ Equivalent) present and complete for the semivolatile fraction? ✓ ___ ___

ACTION: If any calibration forms or standard row data are missing, take action specified in 3.2 above.

13.2 Are all base neutral or acid RRFs > 0.050? ✓ ___ ___

YES NO N/A

Check the **average RRFs** of the four System Performance Check Compounds (SPCCs): N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and 4-nitrophenol. These compounds must have **average RRFs** greater than or equal to 0.05 before running samples and should not show any peak tailing.

ACTION: Circle all outliers in red.

ACTION: For any target analyte with **average RRF <0.05**

1. "R" all non-detects;

2. "J" all positive results.

13.3 Are response factors for base neutral or acid target analytes stable over the concentration range of the calibration (% Relative standard deviation [%RSD] < 20.0%)? ✓ ___ ___

NOTE: The % RSD for each individual Calibration Check Compound (CCC, Method 8270D-40 see Table 4) must be less than 30% before analysis can begin. If grater 30%, the lab must clean and recalibrate the instrument.

CALIBRATION CHECK COMPOUNDS

Base/Neutral Fraction	Acid Fraction
Acenaphthene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2,4-Dichlorophenol
Hexachlorobutadiene	2-Nitrophenol
Diphenylamine	Phenol
Di-n-octyl phthalate	Pentachlorophenol
Fluoranthene	2,4,6-Trichlorophenol

YES NO N/A

Benzo(a)pyrene

ACTION: If the %RSD for any CCC >30% and no corrective action taken, then "J" qualify all positive hits and "UJ" qualify all non-detects.

ACTION: Circle all outliers in red.

ACTION: If the % RSD is $\geq$ 20.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, flag all non- detect results for that analyte "R," unusable. Alternatively, the lab should calculate first or second order regression fit of the calibration curve and select the fit which introduces the least amount of error.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

13.4 Did the laboratory calculate the calibration curve by the least squares regression fit? ___ ☑ ___

13.5 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or % RSD? (Check at least two values but if errors are found, check more.) ___ ☑ ___

ACTION: Circle Errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in data assessments.

13.5 Do the target compounds for this SDG include Pesticides? [ ] ___ ☑ ___

YES NO N/A

13.6 If the pesticide compounds include DDT, was the percent breakdown of DDT to DDD and DDE greater than 20%? ___ [ ] ✓

ACTION: If DDT percent breakdown exceeds 20%:

i. Qualify all positive results for DDT with "J". If DDT was not detected, but DDD and DDE results are positive, qualify the quantitation limit for DDT as unusable, "R".

ii. Qualify all positive results for DDD and DDE as presumptively present at an approximate concentration "JN".

14.0 GC/MS Calibration Verification (Form VII/Equivalent)

14.1 Are the Calibration Verification Forms (Form VII) present and complete for all compounds of interest? [✓] ___ ___

14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

_____

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed within twelve hours of every sample analysis,

YES NO N/A

call lab for explanation/resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").

14.3 Do any of the SPCCs have an RRF <0.05? ___ ☑ ___

If YES, make a note in data assessment if the lab did not take corrective action specified in section 7.4.4, page 8270D-18. [ ] ☑ ___

14.4 Do any of the CCCs have a %D between the initial and continuing RRF which exceeds 20.0%?

ACTION: If yes, make a note in data assessment.

14.5 Do any semivolatile compounds have a % Difference (% D) between the initial and continuing RRF which exceeds 20.0%? ___ ☑ ___

ACTION: Circle all outliers in red.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated (J). When %D is above 90%, qualify all non-detects for that analyte as "R", unusable.

14.6 Do any semivolatile compounds have a RRF < 0.05? ___ ☑ ___

ACTION: Circle all outliers in red.

ACTION: If RRF < 0.05, qualify as unusable ("R") associated non-detects and "J" associated positive values.

14.7 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or percent difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more). ___ ☑ ___

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

YES NO N/A

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect(s) in the data assessments.

15.0 Internal Standards (Form VIII)

15.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to + 100%) for each continuing calibration? ✓ ___ ___

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area	LowerLimit	Upper Limit

(Attach additional sheets if necessary.)

Note: Check Table 5, 8270D-41 for associated analytes.

ACTION: i. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard.

ii. Non-detects associated with IS > 100% should not be qualified.

276

YES NO N/A

iii. If the IS area is below the lower limit (<50%), qualify all associated non-detects (U-values) "J". If extremely low area counts are reported (<25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable (R).

15.2 Are the retention times of all internal standards within 30 seconds of the associated calibration standard? ✓ ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Laboratory Control Samples (LCS)

16.1 Were any LCS samples run in order to verify analytes which failed criteria for spike recovery? ✓ ___ ___

16.2 Did the lab spike LCS sample spiked with the same analytes and the same concentrations as the matrix spike? ✓ ___ ___

16.3 Were the mean and standard deviation of all analytes within the QC acceptance ranges as shown in Table 6, 8270D-43? [ ] ✓ ___

one of 3 LCS exhibited 1 %rec slightly low - see attached sheet

ACTION: If the recovery of any analyte falls out of the designated range, the analytical results for that compound is suspect and should be qualified "J" in the unspiked samples.

17.0 Field Duplicates

17.1 Were any field duplicates submitted for semivolatile analysis? ✓ ___ ___

3

SEMI-VOLATILE ORGANIC LAB CONTROL SAMPLE RECOVERY

EPA Sample No.: 71165LCS

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	LCS CONCENTRATION UG/KG	LCS % REC #	LCS % RPD	QC LIMITS RPD	QC LIMITS REC.
1-Methylnaphthalene	25	18.4	73.6 *		30.0	77 - 140
2-Methylnaphthalene	25	20.5	82.0		30.0	45 - 105
Acenaphthene	25	23.4	93.6		30.0	45 - 105
Acenaphthylene	25	22.8	91.2		30.0	45 - 110
Anthracene	25	22.7	90.8		30.0	55 - 105
Benzo(a)anthracene	25	22.6	90.4		30.0	50 - 110
Benzo(a)pyrene	25	23.2	92.8		30.0	50 - 110
Benzo(b)fluoranthene	25	22.2	88.8		30.0	45 - 115
Benzo(g,h,i)perylene	25	23.7	94.8		30.0	40 - 125
Benzo(k)fluoranthene	25	24.9	99.6		30.0	15 - 125
Chrysene	25	23.8	95.2		30.0	55 - 110
Dibenzo(a,h)anthracene	25	23.2	92.8		30.0	45 - 125
Fluoranthene	25	22	88.0		30.0	55 - 115
Fluorene	25	22.5	90.0		30.0	50 - 110
Indeno(1,2,3-cd)pyrene	25	23.4	93.6		30.0	40 - 120
Naphthalene	25	23.8	95.2		30.0	40 - 105
Phenanthrene	25	22.1	88.4		30.0	50 - 110
Pyrene	25	22.3	89.2		30.0	45 - 125

J/UJ

Spike Recovery: 1 out of 18 outside limits

All samples except VWW06-EB01-020411 associated w/ this LCS

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS:

180311 1923

Form III

272

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

VWW06-SD011-0211
VWW06-SD011P-0211 > See attached sheet

VWW06-SD006-0211
VWW06-SD006P-0211 > No qual required

DataQual **PAH**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD011-0211
Duplicate Sample ID: VWW06-SD011P-0211

Water: RPD>75%
Soil: RPD>100%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
phenol			#DIV/0!
naphthalene			#DIV/0!
2-methylnaphthalene			#DIV/0!
1-methylnaphthalene			#DIV/0!
acenaphthylene			#DIV/0!
acenaphthene			#DIV/0!
fluorene			#DIV/0!
phenanthrene	17.5		200
anthracene			#DIV/0!
fluoranthene	43.6	13.9	103
pyrene	38.8	13.4	97
benzo(a)anthracene	30.6	12.3	85
chrysene	26.5	16.3	48
benzo(b)fluoranthene	41.2	29.7	32
benzo(k)fluoranthene	15.2	11.7	26
benzo(a)pyrene	29.1	20.4	35
indeno(1,2,3-cd)pyrene	16.8	13.3	23
dibenz(a,h)anthracene			#DIV/0!
benzo(g,h,i)perylene	17.2	13.6	23

* one values below RL
Only values above RL listed

COMMENTS: Qualify phenanthrene as estimated (J/UJ)

DataQual **PAH**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD006-0211
Duplicate Sample ID: VWW06-SD006P-0211

Water: RPD>75%
Soil: RPD>75%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
phenol			#DIV/0!
naphthalene			#DIV/0!
2-methylnaphthalene			#DIV/0!
1-methylnaphthalene			#DIV/0!
acenaphthylene			#DIV/0!
acenaphthene			#DIV/0!
fluorene			#DIV/0!
phenanthrene			#DIV/0!
anthracene			#DIV/0!
fluoranthene	72.9	122	50
pyrene	63.6	106	50
benzo(a)anthracene	59.9	102	52
chrysene	54.1	92.4	52
benzo(b)fluoranthene	96.1	160	50
benzo(k)fluoranthene	37.8	63.4	51
benzo(a)pyrene	62.5	110	55
indeno(1,2,3-cd)pyrene	33.7	61.4	58
dibenz(a,h)anthracene			#DIV/0!
benzo(g,h,i)perylene	32.1	62.2	64

* one values below RL
Only values above RL listed

COMMENTS: No qualifications required.

Initial Calibration Date: 2/8/2011

RRF and %RSD Calculations:

Compound Name: napthalene

Lab Value: 1.062

Area of Compound	231950
Area of Internal STD	17466
Conc. of Internal STD	0.8
Conc. of Compound	10
Calculated RRF	1.062

Compound Name: benzo(g,h,i)perylene

Lab Value: 7.6

RRF of STD 1	1.823
RRF of STD 2	1.521
RRF of STD 3	1.403
RRF of STD 4	1.468
RRF of STD 5	1.425
RRF of STD 6	1.592
RRF of STD 7	1.565
RRF of STD 8	1.573
RRF of STD 9	1.561
RRF of STD 10	1.599
Calculated % RSD	7.6

Continuing Calibration File ID: 2/9/2011

RRF and %D Calculations:

Compound Name: chrysene

Lab Value: 1.227

Area of Compound	20336
Area of Internal STD	26519
Conc. of Internal STD	0.8
Conc. of Compound	0.5
Calculated RRF	1.227

Compound Name: phenanthrene

Lab Value: 3.7

Average RRF	1.109
Calibration Check RRF	1.15
Calculated % D	-3.7

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8270D.

IV. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8270 semi-volatile analysis.
Water samples were prepared by SW846 EPA 3510 for 8270 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met with the exception of:
Sample VWW06-SD006P-0211 was recovered above criteria for the following surrogate(s): 2-Fluorobiphenyl at 163 % with criteria of (45-105), p-Terphenyl-d14 at 146 % with criteria of (30-125). The most probable cause is matrix interference. This sample required a 10X dilution for analysis due to the viscosity of the sample extract. At a 10X dilution factor, the surrogate is nearly diluted out.

Sample VWW06-SD008-0211 was recovered below criteria for the following surrogate(s): 2-Fluorobiphenyl at 33.5 % with criteria of (45-105), p-Terphenyl-d14 at 29.4 % with criteria of (30-125). The most probable cause is matrix interference. No further action was taken.

Samples coded accordingly.

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met with the exception of:
LCS 71165LCS was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered below criteria: 1-Methylnaphthalene at 73.6 % with criteria of (77-140).

Samples coded accordingly. Since just one compound was recovered only slightly low, no further action was taken.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SD003-0211MS was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered above criteria: Acenaphthene at 111 % with criteria of (45-105), Anthracene at 126 % with criteria of (55-105), Benzo(a)anthracene at 131 % with criteria of (50-110), Benzo(a)pyrene at 117 % with criteria of (50-110), Dibenzo(a,h)anthracene at 129 % with criteria of (45-125), Fluoranthene at 126 % with criteria of (55-115), Naphthalene at 122 % with criteria of (40-105).

SD - VWW06-SD003-0211SD was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered below criteria: 1-Methylnaphthalene at 66.7 % with criteria of (77-140), Benzo(a)pyrene at 0 % with criteria of (50-110), Benzo(b)fluoranthene at 0 % with criteria of (45-115), Benzo(g,h,i)perylene at 0 % with criteria of (40-125), Benzo(k)fluoranthene at 8.9 % with criteria of (15-125), Chrysene at 13.2 % with criteria of (55-110), Fluoranthene at 50 % with criteria of (55-115), Indeno(1,2,3-cd)pyrene at 0.5 % with criteria of (40-120), Phenanthrene at 42.2 % with criteria of (50-110), Pyrene at 16.4 % with criteria of (45-125). The following analyte(s) exceeded RPD criteria: Acenaphthylene at 32.9 % with criteria of (30), Anthracene at 30.5 % with criteria of (30), Benzo(a)anthracene at 33.9 % with criteria of (30), Benzo(a)pyrene at 54.4 % with criteria of (30), Benzo(b)fluoranthene at 45.9 % with criteria of (30), Benzo(g,h,i)perylene at 53.6 % with criteria of (30), Benzo(k)fluoranthene at 36.6 % with criteria of (30), Chrysene at 31.6 % with criteria of (30), Dibenzo(a,h)anthracene at 38.3 % with criteria of (30), Fluoranthene at 35.5 % with criteria of (30), Indeno(1,2,3-cd)pyrene at 53 % with criteria of (30), Phenanthrene at 32.7 % with criteria of (30), Pyrene at 35.3 % with criteria of (30).

Samples coded accordingly. The most probable cause is matrix interference. The parent and MS/MSD all required 5X dilution for analysis due to the viscosity of the sample extract. No further action was taken.

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.
Sample VWW06-SD0010-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD0011-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD0011P-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD003-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD004-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD005-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD006-0211 required a 5X dilution due to the viscosity of the sample extract.

Sample VWW06-SD006P-0211 required a 10X dilution due to the viscosity of the sample extract.

Sample VWW06-SD009-0211 required a 5X dilution due to the viscosity of the sample extract.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:
Name: Brian C. Spaan **Title:** Lab Director

SIGNED: **DATE:**
03/11/2011

USEPA Region II
SW846 Method 8081B Pesticides

Date: October 2006
SOP HW-44, Rev.1.0

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 3501993
LAB: PEL SITE: Viegues PR SWMU6

1.0 Data Completeness and Deliverables	YES	NO	N/A
1.1 Has all the data been submitted in CLP deliverable format?	[✓]	___	___
1.2 Have any missing deliverables been received and added to the data package?	[ ]	___	✓

Resubs / corrections rcd.

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative			
2.1 Is a laboratory narrative or cover letter present?	[✓]	___	___
2.2 Are the case number and/or SDG number contained in the narrative or cover letter?	[✓]	___	___

3.0 Data Validation Checklist			
3.1 Does this data package contain:			
Water data?	[ ]	___	✓
Waste data?	[ ]	___	✓
Soil/solid data?	[✓]	___	___

also 1 rinse blank

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Tuesday, April 19, 2011 6:07 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs
Attachments: P1598.pdf; P1469.pdf; P4026.pdf; P3933.pdf; P3316.pdf; P2995.pdf; P1385.pdf; P1193.pdf; P2427.pdf; P2727.pdf; P2850.pdf; P1275.pdf; P1518.pdf; P1612.pdf

Jackie:
Good afternoon.
I have attached revised 8081/8082 prep logs. The Clean up used (if any) can be found in the 2nd to the last column on the Extraction Logs.
Please contact me with any questions or concerns.
These pages have been paginated with the SDG number at the bottom of each page for reference.
Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Friday, April 15, 2011 9:52 AM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Hi John,

Please tell me where I would find this information in the prep. logs. I see a list of solvents, etc. at the end of the extraction page but don't know if that indicates that something was done. For example – on the pesticides for SDG 3501993 p 2996 florisil is mentioned with a number. However, the statement below suggests that there was no florisil clean-up performed. I need to be able to see what you have done as Region II questions are very specific on their DV check-lists. If clean-ups are performed, exactly where would they be listed in the logs? Thanks for further clarification!

Jackie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Friday, April 15, 2011 8:14 AM
To: John Heyman [PEL]; Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Jackie:
Per our Lab Manager:

If we perform clean ups then:

Only copper clean ups performed on the 8081. If we perform any clean ups then all the samples and QC would go through the same clean up steps.
PCBs get copper and acid treated, again all QC receive the same treatment.

This should have been noted in the prep logs if performed.

Let me know if you need any additional information.

Thanks!
John

From: Mark Gudnason [PEL] **On Behalf Of** John Heyman [PEL]
Sent: Thursday, April 14, 2011 4:49 PM
To: Jacqueline Cleveland; John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: Question RE- Pesticides & PCBs

Jackie,

John has left for the day but will address this asap tomorrow.

Mark

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, April 14, 2011 4:07 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: FW: Question RE- Pesticides & PCBs
Importance: High

Hi John,

I am just verifying that you received the question noted below! Thank you.

Jackie

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Wednesday, April 13, 2011 8:04 PM
To: 'John Heyman [PEL]'
Cc: 'DataQual Environmental Services, LLC'; 'Michael.Zamboni@CH2M.com'; 'Vickie.Weber@ch2m.com'
Subject: Question RE- Pesticides & PCBs

Good Morning John,

Quick question on the extraction procedures for the Pesticides and PCBs. I need to know what clean-up procedures were used on the sample extracts and whether or not any QC checks were performed to verify the procedures. If there were clean-up checks (for example – florisil cartridge checks) please include results of those checks in your response. Thanks for your help!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

282

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8081.

IV. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8081 semi-volatile analysis.
Water samples were prepared by SW846 EPA 3510 for 8081 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

Note that Form 8 indicates retention time failures. This is only with respect to the front column initial calibration. When the retention time windows are adjusted to the opening CCV of the back column as indicated by the method, all retention time criteria are met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met with the exception of:
Sample VWW06-SD0010-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 49.5 % with criteria of (70-125), Decachlorobiphenyl at 28 % with criteria of (55-130).

Sample VWW06-SD003-0211 was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 150 % with criteria of (70-125).

Sample VWW06-SD003-0211SD was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 141 % with criteria of (70-125).

Sample VWW06-SD004-0211 was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 141 % with criteria of (70-125).

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

Sample VWW06-SD006-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 54.6 % with criteria of (70-125), Decachlorobiphenyl at 34.6 % with criteria of (55-130).

Sample VWW06-SD007-0211 was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 131 % with criteria of (70-125).

Sample VWW06-SD008-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 62.7 % with criteria of (70-125).

Sample VWW06-SD009-0211 was recovered above criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 135 % with criteria of (70-125).

* The most probable cause of these exceedances is the high content of sulfur in the samples. Copper cleaning was performed, however the sulfur content in the samples was high. Samples coded accordingly.

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SD003-0211MS was analyzed with the soil samples extracted on 02/08/11. The following analyte(s) were recovered below criteria: Aldrin at 34.6 % with criteria of (45-140), delta-BHC at 36.4 % with criteria of (55-130), Heptachlor at 37.2 % with criteria of (50-140), Heptachlor epoxide at 25 % with criteria of (65-130) and the following analyte(s) were recovered above criteria: 4,4'-DDE at 130 % with criteria of (70-125), alpha-BHC at 159 % with criteria of (60-125), alpha-Chlordane at 394 % with criteria of (65-120).

SD - VWW06-SD003-0211SD was analyzed with the soil samples extracted on 02/08/11. The following analyte(s) were recovered below criteria: Aldrin at 33.6 % with criteria of (45-140), alpha-Chlordane at 63.5 % with criteria of (65-120), delta-BHC at 51.8 % with criteria of (55-130), Heptachlor epoxide at 27.3 % with criteria of (65-130) and the following analyte(s) were recovered above criteria: 4,4'-DDD at 323 % with criteria of (30-135), 4,4'-DDE at 284 % with criteria of (70-125). The following analyte(s) exceeded RPD criteria: 4,4'-DDD at 51.5 % with criteria of (30), 4,4'-DDE at 34.7 % with criteria of (30), alpha-BHC at 58.5 % with criteria of (30), alpha-Chlordane at 143.4 % with criteria of (30), delta-BHC at 36.9 % with criteria of (30), Heptachlor at 37.7 % with criteria of (30).

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

* The most probable cause of these exceedances is the high content of sulfur in the samples. Copper cleaning was performed, however the sulfur content in the samples was high. Samples coded accordingly.

E. Internal Standards:

This method does not require the use of internal standards.

F. Samples:

Sample analysis proceeded normally.
Sample VWW06-SD0010-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD003-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD004-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD005-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD006-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD006P-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD007-0211 required a 2X dilution due to high concentration of sulfur.

Sample VWW06-SD009-0211 required a 2X dilution due to high concentration of sulfur.

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:
Name: Brian C. Spaan **Title:** Lab Director

SIGNED: **DATE:**
03/03/2011

ORGANOCHLORINE PESTICIDE

	YES	NO	N/A

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? [✓] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ✓ [ ] ___

ACTION: If any sample analyzed as a soil, other than than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, all non detects are qualified as unusable, "R", and positive results flagged "J".

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

Temps > 6°C which is SAP limit. 1 cooler at 9.9 & 2 cooler at 10.5 - J/UJ all samples

2.0 Holding Times

2.1 Have any organochlorine pesticide technical holding times, determined from date of collection to date of extraction, been exceeded? ___ [✓] ___

Water and waste samples for organochlorine pesticide analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

2/4
2/7
2/8 & 2/9
2/18 & 2/10

all HT were met

ACTION: Qualify sample results according to Table 1.

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J*	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

YES NO N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [✓] Rinse blk ___ ___

b. Soil/Solid [✓] ___ ___

3.2 Are all the pesticide samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] Rinse blk ___ ___

b. Waste [ ] ___ [✓]

c. Soil/Solid [✓] ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ for all samples, including MS and MSDs, LCSs and all blanks? [ ] xl com JAC 41211 [✓] ___

Note: Reviewer shall use lab in-house recover limits if available. In-house criteria should be examined for reasonableness. In-house criteria used

ACTION: Circle all outliers in red. Follow surrogate action Table 2.

3.5 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate action, Table 2 below.

2A

SOIL PESTICIDE ORGANIC SURROGATE RECOVERY

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG NO.: 3501993

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

EPA Sample NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	TOT OUT	
70426MB	96.5	85.0					0	
70427LCS	98.4	88.5					0	
VWW06-SD0010-0211	49.5 *	28.0 *					2	JTUJ
VWW06-SD0011-0211	71.6	63.8					0	
VWW06-SD0011P-0211	82.5	62.9					0	
VWW06-SD003-0211	150.0 *	64.6					1	J+
VWW06-SD003-0211MS	108.0	64.2					0	
VWW06-SD003-0211SD	141.0 *	67.1					1	NQ
VWW06-SD004-0211	141.0 *	56.4					1	J+
VWW06-SD005-0211	121.0	67.4					0	
VWW06-SD006-0211	54.6 *	34.6 *					2	JTUJ
VWW06-SD006P-0211	72.4	69.7					0	
VWW06-SD007-0211	131.0 *	66.2					1	NQ - no positive
VWW06-SD008-0211	62.7 *	79.7					1	JTUJ
VWW06-SD009-0211	135.0 *	67.1					1	J+

all quantitation was done on STX-CLP1

Control Limits

S1	= 2,4,5,6-tetrachloro-m-xylene	70 -	125
S2	= Decachlorobiphenyl	55 -	130

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

Control limit source: (lab/method) METHOD

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Form II

180311 1924

YES NO N/A

Table 2. Surrogate Recovery Criteria

using lab QC limits

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample(LCS)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples. [✓] ___ ___

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

290

YES NO N/A

4.2 Were Laboratory Control Samples analyzed at the required concentration for all analytes of interest as specified in Table 3 below. [✓] ___ ___

Note: Use lab in-house criteria, if available. method & lab SOP used - not Table 3

Table 3. LCS Spiking Criteria

LCS Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml	Recovery Limits (%)
gamma-BHC	0.05	1	50-120
Heptachor epoxide	0.05	1	50-120
Dieldrin	0.01	1	30-130
4,4'-DDE	0.01	1	50-150
Endrin	0.01	1	50-120
Endosulfan sulfate	0.01	1	50-120
gamma-Chloradane	0.05	1	30-130
Tetrachloro-m-xylene(surrogate)	0.20	3	30-150
Decachlorobiphenyl (surrogate)	0.40	3	30-150

Note: The LCS might be spiked with the same analytes at the same concentration as the matrix spike.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in table above? [✓] ___ ___

YES NO N/A

ACTION: For LCS % recovery not meeting the required recovery, follow the required action in Table 4 below.

Table 4. LCS Recovery Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Upper Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? ☑ ___ ___

NOTE: For soil and waste samples showing detectable amounts of organics, the lab may substitute replicate samples in place of the matrix spike (see page 8000B-40, section 8.5.3).

5.2 Have MS/MD or MS/MSD results been summarized on Form III/Equivalent? ☑ ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000B-39, section 8.5.])

		YES	NO	N/A
a.	Water	[ ]	___	___
b.	Waste	[ ]	___	___
c.	Soil/Solid	[ ]	___	___

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 We Were Matrix Spike Samples analyzed at the required concentration for all analytes of interest as specified in Table 5 below. [ ] ___ ___

Note: Spiking analytes may differ from those in Table 5. Check QA project plan or task order.

Lab SOPs method used not Table 5

Table 5. Matrix Spiking Criteria

Matrix Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml
gamma-BHC	0.05	1
Heptachor	0.05	1
Aldrin	0.05	1
Dieldrin	1.0	1
Endrin	1.0	1
4,4'-DDT	1.0	1

Note: For aqueous organic extractable, the spike concentration should be:

1) For regulatory compliance monitoring - the regulatory concentration limit or 1 to 5 times the expected background concentration, whichever is higher;

2) For all other aqueous samples - the larger of either 1 to 5 x times the expected background

YES NO N/A

concentration, or the same as the QC check sample concentration (see section 4 above);

3) For soil/solid and waste samples - the recommended concentration is 20 times the estimated quantitation limit (EQL).

No action is taken based on MS or replicate data alone. However, using informed professional judgement, the data reviewer may use the matrix spike or laboratory replicate results in conjunction with other QC criteria and determine the need for some qualification of the data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples.

5.5 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in Table 6 below. [ ] ✓ ___

used lab SOP & method, not Table 6

Note: Use lab in-house criteria, if available.

Table 6. Matrix Spike Recovery Criteria

Compound	% Recovery Water	RPD Water	% Recovery Soil	RPD Soil
gamma-BHC	56-123	0-15	46-127	0-50
Heptachor	40-13	0-20	35-130	0-31
Aldrin	40-120	0-22	34-132	0-43
Dieldrin	52-126	0-18	31-134	0-38
Endrin	56-121	0-21	42-139	0-45
4,4'-DDT	38-127	0-27	23-134	0-50

NOTE: The actual number of MS analytes depends on the number analytes being measured (e.g., total number of MS plus MSD compounds). If only chlordane or toxaphene are the analytes of

See Form 3 for

3

PESTICIDE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.: VWW06-SD003-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/4022

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC.
alpha-BHC	38	0	60	159.0 *	60 - 125
beta-BHC	38	0	26	68.1	60 - 125
delta-BHC	38	0	14	36.4 *	55 - 130
gamma-BHC (Lindane)	38	0	25	67.3	60 - 125
Heptachlor	38	0	14	37.2 *	50 - 140
Aldrin	38	0	13	34.6 *	45 - 140
Heptachlor epoxide	38	0	9.4	25.0 *	65 - 130
Endosulfan I	38	0	33	87.0	15 - 135
Dieldrin	38	0	34	89.6	65 - 125
4,4'-DDE	38	94	140	130.0 *	70 - 125
Endrin	38	0	28	75.5	60 - 135
Endosulfan II	38	0	30	80.3	35 - 140
4,4'-DDD	38	59	110	130.0	30 - 135
Endosulfan sulfate	38	0	26	68.6	60 - 135
4,4'-DDT	38	3.2	28	66.0	45 - 140
Methoxychlor	38	0	27	72.9	55 - 145
Endrin aldehyde	38	0	18	46.8	35 - 145
gamma-Chlordane	38	0	32	85.9	65 - 125
alpha-Chlordane	38	0	150	394.0 *	65 - 120
Endrin ketone	38	0	29	76.6	65 - 135

NQ, MSD OK
J/UJ
NQ MSD OK
J/UJ
J/UJ
J+
J/UJ

Spike Recovery: 7 out of 20 outside limits

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

Form III

180311 1924

3

PESTICIDE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

VWW06-SD003-0211SD

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/4

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.	
alpha-BHC	38	33	85.4	58.5 *	30	60 - 125	J
beta-BHC	38	25	64.8	2.8	30	60 - 125	
delta-BHC	38	20	51.8 *	36.9 *	30	55 - 130	J/UJ
gamma-BHC (Lindane)	38	28	72.1	9.1	30	60 - 125	
Heptachlor	38	20	53.4	37.7 *	30	50 - 140	NQ
Aldrin	38	13	33.6 *	0.8	30	45 - 140	J/UJ
Heptachlor epoxide	38	10	27.3 *	11.1	30	65 - 130	
Endosulfan I	38	42	110.0	25.4	30	15 - 135	
Dieldrin	38	35	90.4	2.9	30	65 - 125	
4,4'-DDE	38	200	284.0 *	34.7 *	30	70 - 125	J+
Endrin	38	33	85.2	14.1	30	60 - 135	
Endosulfan II	38	34	89.8	13.3	30	35 - 140	
4,4'-DDD	38	180	323.0 *	51.5 *	30	30 - 135	NQ MSOK
Endosulfan sulfate	38	31	79.9	17.3	30	60 - 135	
4,4'-DDT	38	26	59.1	7.8	30	45 - 140	
Methoxychlor	38	30	77.1	7.7	30	55 - 145	
Endrin aldehyde	38	19	49.5	7.7	30	35 - 145	
gamma-Chlordane	38	34	88.5	5.1	30	65 - 125	
alpha-Chlordane	38	24	63.5 *	143.4 *	30	65 - 120	J/UJ
Endrin ketone	38	32	84.4	11.8	30	65 - 135	

RPD: 6 out of 20 outside limits

Spike Recovery: 6 out of 20 outside limits

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

Form III

180311 1924

YES NO N/A

interest, the spiked sample should contain the most representative multi-component analyte.

ACTION: Follow the matrix spike actions (Table 7) for pesticide analyses.

Table 7. Matrix Spike Qualifying Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% R ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limit	No qualifications	

Note: When the results of the matrix spike analyses indicates a potential problem due to the sample matrix itself, the LCS results are used to verify the laboratory can perform analyses in a clean matrix.

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on Method Blank Summary form(s) (Form IV)?

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? [v] ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any other time during the analytical shift.

297

YES NO N/A

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for pesticides? ☑ ___ ___

ACTION: Use professional judgement to determine the effect on the data.

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for organochlorine pesticides? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ ☑ ___

7.2 Do any field/rinse blanks have positive organochlorine pesticide results? ___ ☑ ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in

YES NO N/A

another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 8 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 8. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying the calibration criteria.

Note: When applied as described in Table 8 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams", "junk peaks"), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference.

YES NO N/A

Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? ☑ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic column used for the analysis of organochlorine pesticides? Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (See Method 8081B-8, section 4.2) ☑ ___ ___

8.2 If capillary columns were used, were they both wide bore (.53 mm ID) fused silica GC columns, such as DB-608 and DB-1701 or equivalent. Indicate the specific type of column used for:

column 1: STX-CLP 1

column 2: STX-CLP 2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. DDT/endrin breakdown check ☑ ___ ___

	YES	NO	N/A
b. toxaphene	[ ]	___	✓
c. technical chlordane	[ ]	___	✓
d. 5 pt. initial calibration standards	[✓]	___	___
e. calibration verification standards	[✓]	___	___
f. LCS	[✓]	___	___
g. Method blanks	[✓]	___	___

ACTION: If no, take action specified in 3.2 above.

9.2 Has a DDT/endrin breakdown check standard (at the mid-concentration level) been analyzed at the beginning of each analytical sequence on both columns (page 8081B-24, section 8.2.3)? [✓] ___ ___

ACTION: If no, take action as specified in 3.2 above.

9.3 Has the individual % breakdown exceeded 20.0% on either column for:

- 4,4' - DDT? ___ [✓] ___
- endrin? ___ [✓] ___

ACTION: If any % breakdown has failed the QC criteria in the breakdown check standard, qualify all sample analyses in the entire analytical sequence as described below.

a. If 4,4'-DDT breakdown is greater than 20.%:

i. Qualify all positive results for DDT with 'J". If DDT was not detected, but DDD and DDE are positive, then qualify the quantitation limit for DDT as unusable ("R").

ii. Qualify positive results for DDD and DDE as presumptively present at an approximated quantity ("NJ").

YES NO N/A

b. If endrin breakdown is greater than 20.0%:

i. Qualify all positive results for endrin with "J". If endrin was not detected, but endrin aldehyde and endrin ketone are positive, then qualify the quantitation limit for endrin as unusable ("R").

ii. Qualify positive results for endrin ketone and endrin aldehyde as presumptively present at an approximated quantity ("NJ").

9.4 Are data summary forms (containing calibration factors or response factors) for the initial 5 pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? [✓] ___ ___

NOTE: If internal standard calibration procedure is used (page 8000B-16, section 7.4.2.2), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (page 8000B-16, section 7.4.2.1), then calibration factors must be used.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.5 Are there any transcription/calculation errors between raw data and data summary forms. ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.6 Are standard retention time (RT) windows for each analyte of interest presented on modified CLP summary forms? [ ] ✓ ___

Expected RT are present along with delta RT.

302

YES NO N/A

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all pesticides are established using retention times from three calibration standards analyzed during the entire analytical sequence (page 8081B-15, section 7.4.6).

A 72 hr. sequence is not required with this method, however, the method states that best results are obtained using retention times which span the entire sequence; i.e., using the mid level from the 5 pt. calibration, one of the mid-concentration standards analyzed during mid-sequence and one analyzed at the end.

9.7 Were RT windows on the confirmation column established using three standards as described above? [✓] ___ ___

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.6 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

RTW established according to lab SOP & method.

ACTION: Note potential problems, if any, in the data assessment.

9.8 Do all standard retention times in each level of the initial 5 pt. calibrations for pesticides fall within the windows established during the initial calibration sequence? [✓] ___ ___

ACTION: i. If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standards, spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows

YES NO N/A

may be too tight. If so, RT windows should be recalculated as per page 8081B-15, section 7.4.6.2

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

ACTION: For toxaphene and chlordane, the RT may be outside the RT window, but these analytes may still be identified from their individual patterns.

9.9 Has the linearity criteria for the initial calibration standards been satisfied for both columns? (% RSD must be < allowable limits* for all analytes). ✓ ___ ___

ACTION: If no, follow the actions in Table 9 below.

Table 9. Initial Calibration Linearity Criteria

Criteria	Criteria	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD exceeds allowable limits*	J	No qualification
% RSD within allowable limits*	NO qualifications	

* %RSD ≤ 20% for single component compounds except alpha-BHC and delta-BHC.
%RSD ≤ 25% for alpha-BHC and delta-BHC
%RSD ≤ 30% for Toxaphene peaks
%RSD ≤ 30% for surrogates(tetrachloro-m-xylene and decachlorobiphenyl).

9.10 Has a calibration verification standard containing all analytes of interest been analyzed on each

304

YES NO N/A

working day, prior to sample analyses (pages 8081B-15, sections 7.5.2)? [✓] ___ ___

9.11 Has a calibration verification standard also been analyzed after every 10 samples and at the end of each analytical sequence (page 8081B-15, section 7.5.2)? [ ] ___ ✓

method requ IS for every 20 samples

ACTION: If no, take action as specified in section 3.2 above. Rev2 2/07

9.12 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence (closing CCV). Has no more than 72 hours elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene CCV? [✓] ___ ___

ACTION: See Table 10 below.

9.13 Has the percent difference (%D) exceeded ± 20% for any organochlorine pesticide analyte in any calibration verification standard? ✓ [ ] ___

9.14 Has a new 5 pt. calibration curve been generated for those analytes which failed in the calibration verification standard (page 8081B-16, section 7.5.2.2), and all samples which followed the out-of-control standard (page 8081B-16, section 7.5.2.3) reinjected? [ ] ___ ✓

ACTION: If the %D for any analyte exceeded the ± 20% criterion and the instrument was not recalibrated for those analytes, see table below.

9.15 Have <u>daily</u> retention time windows been properly calculated for each analyte of interest (page 8081B-16, section 7.5.3)), using RTs from the associated mid concentration standard and standard deviation from the initial calibration)? [✓] ___ ___

Retention times were appropriately updated based on method / lab SOP

305

YES NO N/A

ACTION: If no, take action specified in section 3.2 above or recalculate RT windows using the procedure outlined in method 8081B-16, section 7.5.3.

9.16 Do all standard retention times for each mid concentration standard fall within the windows established during the initial calibration sequence? [✓] ___ ___

9.17 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows (page 8081B-16, section 7.5.3)? [✓] ___ ___

ACTION: If the answer to either 9.15 or 9.16 above is no, check the chromatograms of all samples which followed the last in-control standard. All samples analyzed after the last in-control standard must be re-injected, if initial analysis indicated the presence of the specific analyte that exceeded the retention time criteria (page 8081B-18, section 7.5.7.). If samples were not re-analyzed, document under Contract Non-compliance in the Data Assessment.

Reviewer has two options to determine how to qualify questionable sample data. First option is to determine if possible peaks are present within daily retention time window. If no possible peaks are found, non-detects are valid. If possible peaks are found (or interference), qualify positive hits as presumptively present "NJ" and non-detects are rejected "R". Second option is to use the ratio of the retention time of the analyte over the retention time of either surrogate. The passing criteria is ± 0.06 RRT units of the RRT of the standard component. Reject "R" all questionable analytes exceeding criteria, and "NJ" all other positive hits.

For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use option 2 specified in paragraph above.

306

7

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Instrument ID: SECD03 CalibrationDate: 02/09/11 Time: 2312

CCV ID: CCV949932 Lab File ID: PCCV4.D Init. Calib. Date Begin: 01/22/11 End: 01/22/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
alpha-BHC	13783.948	14558.525	5.6	AVRG
beta-BHC	6005.0525	5903.1	1.7	AVRG
delta-BHC	12552.014	13176.225	5.0	AVRG
gamma-BHC (Lindane)	12267.139	12641.325	3.1	AVRG
Heptachlor	13014.867	11883.225	8.7	AVRG
Aldrin	11689.867	11993.725	2.6	AVRG
Heptachlor epoxide	11176.018	11168.675	0.1	AVRG
Endosulfan I	10592.932	10720.675	1.2	AVRG
Dieldrin	11102.227	11281.925	1.6	AVRG
4,4'-DDE	10744.475	11343.575	5.6	AVRG
Endrin	9716.8575	8879.25	8.6	AVRG
Endosulfan II	9693.3748	9547.35	1.5	AVRG
4,4'-DDD	9366.7311	10300.875	10.0	AVRG
Endosulfan sulfate	8576.1505	8500.1	0.9	AVRG
4,4'-DDT	9536.5232	9188.25	3.7	AVRG
Methoxychlor	4909.6496	4389.65	10.6	AVRG
Endrin aldehyde	8155.3272	7833.5	3.9	AVRG
gamma-Chlordane	11583.395	11404.325	1.5	AVRG
alpha-Chlordane	11026.805	10997.55	0.3	AVRG
Endrin ketone	11161.001	10905.025	2.3	AVRG
==========				
2,4,5,6-tetrachloro-m-xylene(SURR)	8627.5763	9359.1	8.5	AVRG
Decachlorobiphenyl(SURR)	7247.6127	9000.95	24.2	AVRG

Average Used: 5.1

<- NQ

180311 1924

FORM VII

7

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Instrument ID: SECD03 CalibrationDate: 02/09/11 Time: 2312

CCV ID: CCV949933 Lab File ID: PCCV4.D Init. Calib. Date Begin: 01/22/11 End: 01/22/11

GC Column: STX-CLP2 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
alpha-BHC	25613.363	21792.775	14.9	AVRG
beta-BHC	10900.48	9062.875	16.9	AVRG
delta-BHC	22659.045	19323.95	14.7	AVRG
gamma-BHC (Lindane)	22661.215	19287.15	14.9	AVRG
Heptachlor	23518.546	18224.3	22.5	AVRG
Aldrin	20992.023	17642.45	16.0	AVRG
Heptachlor epoxide	19544.742	16182.325	17.2	AVRG
Endosulfan I	17997.149	15054.35	16.4	AVRG
Dieldrin	19606.746	16599.35	15.3	AVRG
4,4'-DDE	19329.597	16723.45	13.5	AVRG
Endrin	17007.829	14463.05	15.0	AVRG
Endosulfan II	16899.22	13949.475	17.5	AVRG
4,4'-DDD	15899.995	13230.475	16.8	AVRG
Endosulfan sulfate	14771.739	12405.9	16.0	AVRG
4,4'-DDT	16088.249	13319.6	17.2	AVRG
Methoxychlor	8195.7941	6594	19.5	AVRG
Endrin aldehyde	14208.964	11518.725	18.9	AVRG
gamma-Chlordane	20173.884	16552.675	17.9	AVRG
alpha-Chlordane	19414.604	16064.25	17.3	AVRG
Endrin ketone	19710.863	16358.5	17.0	AVRG
==========				
2,4,5,6-tetrachloro-m-xylene(SURR)	16741.21	14744.675	11.9	AVRG
Decachlorobiphenyl(SURR)	13957.776	11353.05	18.7	AVRG

Average Used: 16.6

<- NQ - OK on CLP1

7

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Instrument ID: SECD03 CalibrationDate: 02/10/11 Time: 0338

CCV ID: CCV949934 Lab File ID: PCCV5.D Init. Calib. Date Begin: 01/22/11 End: 01/22/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
alpha-BHC	13783.948	15105.8	9.6	AVRG
beta-BHC	6005.0525	6130.175	2.1	AVRG
delta-BHC	12552.014	13541.425	7.9	AVRG
gamma-BHC (Lindane)	12267.139	13198.5	7.6	AVRG
Heptachlor	13014.867	13020	0.0	AVRG
Aldrin	11689.867	12405.875	6.1	AVRG
Heptachlor epoxide	11176.018	11827.825	5.8	AVRG
Endosulfan I	10592.932	11537.475	8.9	AVRG
Dieldrin	11102.227	11973.325	7.8	AVRG
4,4'-DDE	10744.475	12083.3	12.5	AVRG
Endrin	9716.8575	9522.625	2.0	AVRG
Endosulfan II	9693.3748	10080.675	4.0	AVRG
4,4'-DDD	9366.7311	10763	14.9	AVRG
Endosulfan sulfate	8576.1505	8924.225	4.1	AVRG
4,4'-DDT	9536.5232	10004.025	4.9	AVRG
Methoxychlor	4909.6496	4782.45	2.6	AVRG
Endrin aldehyde	8155.3272	8339.025	2.3	AVRG
gamma-Chlordane	11583.395	12216.725	5.5	AVRG
alpha-Chlordane	11026.805	11733.45	6.4	AVRG
Endrin ketone	11161.001	11642.275	4.3	AVRG
==========				
2,4,5,6-tetrachloro-m-xylene(SURR)	8627.5763	9740.675	12.9	AVRG
Decachlorobiphenyl(SURR)	7247.6127	9683.725	33.6	AVRG

<- NQ

Average Used: 7.5

180311 1924

FORM VII

305

YES NO N/A

See Table 10 below.

Table 10. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RT out of RT window	Use professional judgement	
%D not within +/- 20%	J	UJ
Time elapsed greater than section 9.12 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.18 Are there any transcription/calculation errors between raw data and data summary forms? ___ [V] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [V] ___ ___

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [V] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it

YES NO N/A

accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

11.0 Extraction Method Cleanup Efficiency Verification (Form IX/Equivalent)

11.1 Method 8081B permits a variety of extraction techniques to be used for sample preparation. Which extraction procedure was used?

1. Aqueous samples:

1. Separatory funnel (Method 3510)_____

2. Continuous liquid-liquid extraction (Method 3520)_____

3. Solid phase extraction (Method 3535)_____

4. Other _____

2. Solid samples:

1. Soxhlet (Method 3540) _____

2. Automated Soxhlet (Method 3541)_____

3. Pressurized fluid (Method 3545) _____

4. Microwave extraction (Method 3546)_____

5. Ultrasonic extraction (Method 3550)_____ ✓

6. Supercritical fluid (Method 3562) _____

7. Other _____

11.2 Is Form IX - Pest-1/Equivalent present and complete for each lot of Florisil/Cartridges used? (Florisil Cleanup, Method 3620A, is required for all organochlorine pesticide extracts.) [ ] ___ ✓ ✓

YES NO N/A

ACTION: If no, take action specified in 3.2 above. If data suggests that florisil cleanup was not performed, make note in the reviewer narrative.

NOTE: Method 3620A uses Florisil, while the SOW/CLP allows for Florisil cartridges. Method 3620A does not list which pesticides and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct pesticide list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.3 Are all samples listed on modified CLP Pesticide Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.4 If GPC Cleanup was performed, is Form IX - Pest-2/ Equivalent present? [ ] ___ ✓

ACTION: If GPC was not performed and sample results indicate significant sulfur interference, make note in the data assessment.

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.5 Were the same compounds on Form IX used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.6 Are percent recoveries (% R) of the pesticide and surrogate compounds used to check the efficiency of the cleanup procedures within QC limits listed on Form IX:

80-120% for florisil cartridge check? [ ] ___ ✓

80-110% for GPC calibration? [ ] ___ ✓

YES NO N/A

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 80%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for pesticide compounds. Qualify positive results "J" (estimated).

NOTE: If 2,4,5-trichlorophenol was used to measure the efficiency of the Florisil cleanup and the recovery was > 5%, sample data should be evaluated for potential interferences.

12.0 Pesticide Identification

12.1 Has CLP Form X, showing retention time data for positive results on the two GC columns, been completed for every sample in which a pesticide was detected? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and Florisil cleanup verification forms)? ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both analyses? [✓] ___ ___

Note: Confirmation can be supported by other qualitative techniques such as GC/MS (Method 8270), or GC/AED (Method 8085) if sensitivity permits.

YES NO N/A

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently (see section 9.7 above). Also check for false negatives among the multiple peak compounds toxaphene and chlordane. Were there any false negatives? ___ [✓] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation used as the second column Confirmation? (This is not required). [ ] ___ ✓

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%?~~ 40.0% - SW-846 criteria [ ] ✓ ___

NOTE: The method 8081B requires quantitation from one column. The second column is to confirm the presence of an analyte. Calibration for the Confirmation column is a one point calibration. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

10

PESTICIDE ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.: VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Lab Sample ID: 350199301 Date(s) Analyzed: 02/18/11 02/18/11

Instrumet ID (1): SECD03 Instrumet ID (2): SECD03

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D
4,4'-DDE	*	1	5.924	5.931	0.007	959077	61	94	
		2	6.088	6.096	0.008	1507035	61	94	0.00
4,4'-DDD	*	1	6.721	6.730	0.009	486870	38	59	
		2	6.878	6.887	0.009	741567	36	55	7.02
4,4'-DDT	*	1	7.134	7.141	0.007	28029	2.1	3.2	
		2	7.357	7.363	0.006	72848	3.7	5.7	56.18
2,4,5,6-tetrachloro-m-xylene	*	1	2.852	2.839	0.013	842945	75	115	
		2	2.788	2.792	0.004	695763	34	52.9	73.97
Decachlorobiphenyl	*	1	10.823	10.837	0.014	422867	32	49.7	
		2	11.398	11.408	0.010	674861	36	54.8	9.76

J
NC

* Column used for quantitation

10

PESTICIDE ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.: VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Lab Sample ID: 350199311 Date(s) Analyzed: 02/18/11 02/18/11

Instrumet ID (1): SECD03 Instrumet ID (2): SECD03

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D
4,4'-DDE	*	1	5.927	5.931	0.004	91576	5.8	7.5	
		2	6.090	6.096	0.006	253787	10	13	53.66
4,4'-DDD	*	1	6.725	6.730	0.005	53112	4.2	5.4	
		2	6.880	6.887	0.007	72740	3.5	4.5	18.18
4,4'-DDT	*	1	7.132	7.141	0.009	10512	0.78	1	
		2	7.358	7.363	0.005	47245	2.4	3.1	102.44
2,4,5,6-tetrachloro-m-xylene	*	1	2.849	2.839	0.010	278218	25	31.8	
		2	2.799	2.792	0.007	421811	21	26.8	17.06
Decachlorobiphenyl	*	1	10.823	10.837	0.014	182642	14	18	
		2	11.398	11.408	0.010	285406	15	19.4	7.49

J

U @ LOQ

* Column used for quantitation

10

PESTICIDE ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.

VWW06-SD0011P-0211

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Lab Sample ID: 350199313 Date(s) Analyzed: 02/18/11 02/18/11

Instrumet ID (1): SECD03 Instrumet ID (2): SECD03

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D
4,4'-DDE	*	1	5.929	5.931	0.002	584912	37	16	
		2	6.093	6.096	0.003	966492	39	17	6.06
4,4'-DDD	*	1	6.723	6.730	0.007	48768	3.8	1.7	
		2	6.883	6.887	0.004	38426	1.8	0.81	70.92
4,4'-DDT	*	1	7.134	7.141	0.007	183087	14	5.9	
		2	7.358	7.363	0.005	383594	20	8.5	36.11
2,4,5,6-tetrachloro-m-xylene	*	1	2.855	2.839	0.016	929135	82	35.8	
		2	2.809	2.792	0.017	1634214	81	35	2.26
Decachlorobiphenyl	*	1	10.826	10.837	0.011	821920	63	27.3	
		2	11.399	11.408	0.009	1401345	74	32.2	16.47

J

* Column used for quantitation

YES NO N/A

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

Based on SW-846 methods and SAP 40

% Difference	Qualifier
0-~~25%~~ 40	none
~~26~~-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected) "NJ"	
>50% (Pesticide vale is <CRQL)	"U"
>201%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that the higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ [N] ___

NOTE: Single-peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

Initial Calibration Date: 1/22/11, Instrument SECD03 - Column 1
RRF and %RSD Calculations:

Compound Name: heptachlor in Level 1
Lab Value: 12193.0000

Area of Compound	12193
Conc. of Compound	1
Calculated CF	12193.000

Compound Name: heptachlor
Lab Value: 5.5

CF of STD 1	12193.000
CF of STD 2	12856.400
CF of STD 3	12581.200
CF of STD 4	12975.900
CF of STD 5	12759.567
CF of STD 6	13131.338
CF of STD 7	14639.640
CF of STD 8	12981.887
Calculated % RSD	5.52

Continuing Calibration File ID: 2/10/11, 0338; file ID PCCV5.D
RRF and %D Calculations:

Compound Name: 4,4'-DDD
Lab Value: 10763.0000

Area of Compound	430520
Conc. of Compound	40
Calculated CF	10763.000

Compound Name: 4,4'-DDD
Lab Value: 14.9

Average CF	9366.731
CF of CCV	10763
Calculated % D	-14.9

Initial Calibration Date: 2/15/11, Instrument SECD03 - Column 1
RRF and %RSD Calculations:

Compound Name: alpha-BHC in level 3
Lab Value: 19045.7000

Area of Compound	190457
Conc. of Compound	10
Calculated CF	19045.700

Compound Name: alpha-BHC
Lab Value: 8.3

CF of STD 1	17263.000
CF of STD 2	18994.200
CF of STD 3	19045.700
CF of STD 4	20705.325
CF of STD 5	20526.900
CF of STD 6	22417.375
CF of STD 7	21183.580
CF of STD 8	21560.400
Calculated % RSD	8.26

Continuing Calibration File ID: 2/18/2011 @ 1801, file ID PCCV2A.D
RRF and %D Calculations:

Compound Name: 4,4'-DDT
Lab Value: 11494.4750

Area of Compound	459779
Conc. of Compound	40
Calculated CF	11494.475

Compound Name: 4,4'-DDT
Lab Value: 14.7

Average CF	13475.465
CF of CCV	11494.475
Calculated % D	14.7

YES NO N/A

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? ☑ ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? ☑ ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ ☑ ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for organochlorine pesticide analysis? ☑ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

SAMPLE CALCULATION

Sample ID: VWW6-SD005-0211
Standard ID: ICAL 2/15/11
Compound: 4,4'-DDE
Concentration: 9.7 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		118524
CF of Compound		15767.43375
Final Volume		10
Dilution Factor		2
Split Factor		1
Injection Volume		1
Weight of Sample	na	25.55
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.607
Concentration	#DIV/0!	9.69384

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD006-0211
Duplicate Sample ID: VWW06-SD006P-0211

Water: RPD>20%
Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
4,4'-DDE	2.9	5.9	68
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: results <LOD in sample and > LOD in dup. No qualifications were required.

Sample ID: VWW06-SD011-0211
Duplicate Sample ID: VWW06-SD011P-0211

Water: RPD>20%
Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
4,4'-DDE	14	16	13
4,4'-DDD	1.4	1.7	19
4,4'-DDT	7	5.9	17
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: No qualifications were required.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made to determine the proper identification of field duplicates.

Yes NO N/A

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 3501933

LAB: PEL SITE: Vieques CTO-111 SWMU 6

1.0 Data Completeness and Deliverables

1.1 Has all the data been submitted in CLP deliverable format? [✓] ___ ___

1.2 Have any missing deliverables been received and added to the data package? [ ] ___ ✓

resubs/corrections rcd.

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? [✓] ___ ___

2.2 Are the case number and/or SDG number contained in the narrative or cover letter? [✓] ___ ___

3.0 Data Validation Checklist

3.1 Does this data package contain:

Water data? ✓ ___

Waste data? ___ ✓

Soil/solid data? ✓ ___

POLYCHLORINATED BIPHENYLS

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? [✓] ___ ___

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8082 for Aroclor analysis.

IV. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8082 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met with the exception of:
Sample VWW06-SD0010-0211 was recovered below criteria for the following surrogate(s): Decachlorobiphenyl at 48.4 % with criteria of (60-125).

Sample VWW06-SD0011P-0211 was recovered above criteria for the following surrogate(s): Decachlorobiphenyl at 272 % with criteria of (60-125).

Sample VWW06-SD006-0211 was recovered below criteria for the following surrogate(s): Decachlorobiphenyl at 49.3 % with criteria of (60-125).

Samples coded accordingly. The prep analyst noted matrix issues during the solvent reduction steps. Matrix is the most probable reason for the variances. Since the Lab QC met criteria and matrix was noted, no further action required. The surrogates would have met in house limits.

D. Spikes:

PCB 1016 and PCB 1260 were used as the spiking solution for all QC spikes.

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

1. **Laboratory Control Spikes (LCS)**

   All acceptance criteria were met

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met.

E. Internal Standards:

This method does not require the use of internal standards.

F. Samples:

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:

Name: Brian C. Spaan **Title:** Lab Director

SIGNED: **DATE:**
03/01/2011

Yes NO N/A

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ✓ [ ] ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, non detects shall be qualified as unusable, "R."

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2 coolers received at temp > 6°C (9.9°C & 10.5°C) all samples flagged J/UJ

2.0 Holding Times

2.1 Have any PCB technical holding times, determined from date of collection to date of extraction, been exceeded? ___ [✓] ___

Water and waste samples for PCB analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction. Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

ACTION: If technical holding times are exceeded, flag all positive results as estimated, "J," and sample quantitation limits "UJ" and document in the narrative that holding times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all the data should at least be

Yes NO N/A

qualified "J", but the reviewer may determine that non-detects are unusable,"R." (Table 1)

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days(extraction) ≤ 40 days(analysis)	J*	UJ*
	No	> 7 days(extraction) > 40 days(analysis)	J	UJ
	Yes	≤ 7 days(extraction) ≤ 40 days(analysis)	No qualification	
	Yes	> 7 days(extraction) > 40 days(analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days(extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days(extraction) >40 days(analysis)	J	UJ
	Yes	≤ 14days(extraction) ≤ 40 days(analysis)	No qualification	
	Yes	> 14days(extraction) > 40 days(analysis)	J	UJ
	Yes/No	> 28 days(gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste ☑ ___ ___

Yes NO N/A

b. Soil/Solid [✓] [✗] ___

X/com JHC 41211

3.2 Are all the PCB samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ [✓]

c. Soil/Solid [✓] ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ for all samples, including MS and MSDs, LCSs and all blanks? using lab QC limits — [ ] [✓] ___

Note: Reviewer shall use lab in-house recovery limits, if available. In-house criteria should be examined for reasonableness. see Form 2

ACTION: Circle all outliers in red. Follow surrogate criteria, Table 2.

Note: DCB is used when PCBs are determined as Aroclors. DCB is the internal standard when determining PCB congeners and TCMX the surrogate.

3.4 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate criteria, Table 2.

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement

		Yes NO N/A
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample (LCS)

4.1 Are raw data and percent recoveries present for all Laboratory Control samples as required by Method 8000B (section 8.5) and Method 8082A (section 8.4.2)? [✓] ___ ___

Verify that QC check samples were extracted and analyzed by the same procedures used for the actual samples.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation/ resubmittals. Make note in the data assessment.

NOTE: For aqueous samples, an additional QC check sample must be prepared and analyzed when any analyte in a matrix spike fails the required acceptance criteria (see section 5.3 below).

Yes NO N/A

The additional QC check sample must contain each analyte that failed in the MS analysis.

Note: When the results for matrix spike analysis indicates a problem due to sample matrix effects, the LCS results are used to verify the laboratory can perform the analysis in a clean sample.

4.2 Were Laboratory Control Samples analyzed at the required concentration as specified in Method 8000B(sec 8.5) for all analytes as specified in Table 3. [✓] ___ ___

Note: Use lab in-house criteria, if available. Spiked at lab SOP concentrations.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Were the LCS recoveries within the percent recoveries as ~~specified in Table 3~~. lab QC limits [✓] ___ ___

Table 3. LCS Criteria

Compound	% Recovery
Aroclor 1016	50-150
Aroclor 1260	50-150
Tetrachloro-m-xylene (surrogate)	30-150
decachlorobiphenyl (surrogate)	30-150

4.4 If no, were Laboratory Control Samples re-analyzed? [ ] ___ ✓

ACTION: If QC check samples were not re-analyzed, or a general system problem is indicated by repeated failure to meet the QC acceptance criteria specified in the method, make note in the data assessment and use Table 4 recovery actions criteria.

Yes NO N/A

Table 4. LCS Recovery Actions

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Lower Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent) SD003

5.1 Are all data for one matrix spike and matrix duplicate (unspiked) pair (MS/Dup) or matrix spike/matric spike duplicate (MS/MSD)present and complete for each matrix (Method 8082A Section 8.4.1)? [✓] ___ ___

NOTE: For soil and waste samples showing detectable amounts of target analytes, the lab may substitute replicate samples in place of the matrix spike (see Method 8000B-40, section 8.5.3).

5.2 Have MS/Dup or MS/MSD results been summarized on modified CLP Form III? [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/Dup, MS/MSD must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month (Method 8000B-39 (section 8.5)).

a. Water [ ] ___ [✓]

	Yes	NO	N/A
b. Waste	[ ]	___	✓
c. Soil/Solid	[✓]	___	___

ACTION: If any MS/Dup or MS/MSD data are missing, take the action specified in 3.2 above.

5.4 Were ~~Laboratory Control Samples~~ MS/MSD analyzed for all analytes as specified in Table 5, or did the lab ~~use the optional~~ QC acceptance criteria i.e., in-house criteria? [✓] ___ ___

List the criteria used and make note in data assessment.

Criteria used AR1016 40-140 AR1260 60-130

Table 5. MS/MSD Criteria

Compound	Percent Recovery QC Limits	RPD
Aroclor 1016	29-135	0-15
Aroclor 1260	29-135	0-20

5.5 Was the matrix spike prepared at the proper spike concentration? (Method 8000B, section 8.5.1-8.5.2) *[✓] ___ ___

*per lab SOP

For aqueous organic extractable, the spike concentration should be prepared according options in: Method 8000B-40, (section 8.5.1 and 8.5.2).

5.6 Were the matrix spike and matrix spike duplicate recovery and RPD limits met as specified in Table 5. Note: No qualification of the data is necessary on MS and MSD data alone. Use professional judgement to use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If any MS and MSD, percent recovery, or RPD results in the Arcolor fraction is out of specification (Table 5), qualify data to include the consideration of the existence interference in the raw data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples. Use professional judgement to determine the need for qualifications of detects of non-spiked compounds.

Yes NO N/A

[X] ___ ___

Table 6. MS/MSD Actions for Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on CLP equivalent Method Blank Summary form(s) (Form IV)? [✓] ___ ___

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? [✓] ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any time during the analytical shift.

ACTION: If any blank data are missing, take action as specified above (section 3.2) . If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system

Yes NO N/A

printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for PCBs? [✓] ___ ___

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ [✓] ___

7.2 Do any field/rinse blanks have positive PCB results? ___ [✓] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 7 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 7. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples

Yes NO N/A

Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying for calibration criteria.

Note: When applied as described in Table 7 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? ☑ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

Yes NO N/A

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic capillary column used for the analysis of PCBs? ☑ ___ ___

Action: Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (Method 8082, section 4.2)

8.2 Indicate the specific type of narrow bore or wide bore (.53 mm ID, fused silica GC columns, such as DB-608 and DB-1701 or equivalent).

column 1: STX-CLP1

column 2: STX-CLP2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. Samples ☑ ___ ___

b. All blanks ☑ ___ ___

c. Matrix spike samples ☑ ___ ___

d. 5 pt. initial calibration standards ☑ ___ ___

e. calibration verification standards ☑ ___ ___

f. Laboratory Control samples (LCS) ☑ ___ ___

ACTION: If no, take action specified in 3.2 above.

9.2 Are data summary forms (containing calibration factors or response factors) for the initial 5

Yes NO N/A

pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? [Y] ___ ___

Note: Calibration Aroclor mixtures other than 1016/1260 may be used (as per approved project QA plan)

NOTE: If internal standard calibration procedure is used (Method 8000B-15(section 7.4.2.2)), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (Method 8000B-16 (section 7.4.2.1)), then calibration factors must be used. The internal standard approach is highly recommended for PCB congener analysis.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.3 Are there any transcription/calculation errors between raw data and data summary forms? ___ [Y] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.4 Are standard retention time (RT) windows for each PCB peak of interest presented on modified CLP summary forms? [Y] ___ ___

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all PCBs are established using retention times from three calibration standards analyzed during the entire analytical sequence (Method 8000B, section 7.6). Best results are obtained

Yes NO N/A

using retention times which span the entire sequence; i.e., using the calibration verification/continuing calibration standards analyzed every 12 hours.

9.5 Were RT windows on the confirmation column established using three standards as described above? [ ] ✓ ___

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.4 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

RTW's were prepared based on lab SOP recommendations for calculations

ACTION: Note potential problems, if any, in the data assessment.

9.6 Do all standard retention times in each level of the initial 5 pt. calibrations for PCBs fall within the windows established during the initial calibration sequence? [✓] ___ ___

ACTION i: If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standard spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows may be too tight. If so, RT windows should be recalculated as per Method 8081B-15 (section 7.4.6).

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

9.7 Has the linearity criteria for the initial calibration standards been satisfied for both

Yes NO N/A

columns? (% RSD for the calibration factors (CFs) for the three to five major peaks of each of the Aroclor compounds must be < 20.0%). [✓] ___ ___

ACTION: If no, follow Table 8 criteria.

5 point curve for 1016 & 1260; single points for other target aroclors
5 point curve for 1254 (2/13)

Table 8. Initial Calibration CF Action for Aroclor Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD > 20%	J	UJ
% RSD within allowable limits	No qualifications	

9.8 Does the calibration verification/continuing calibration standard contain the PCB peaks of interest, analyzed on each working day, prior to sample analyses (Method 8082, sections 7.6.2)? [✓] ___ ___

9.9 Has a calibration verification/continuing calibration standard been analyzed after every 10 samples and at the end of each analytical sequence (Method 8082A, section 7.6.2). 8082A Rev 1 2/07 [ ] ___ ___

ACTION: If no, take action as specified in section 3.2 above.

Required after every 20 samples or every 12 hours

9.10 Has the percent difference (%D) between the Calibration Factor (CF) of each of the three to five peaks used to identify the Aroclor in the CCV and the CF from these peaks in the initial calibration exceeded ~~± 15%.~~ +/-20% per method 9.3.1 only out for single peaks [✓] [ ] ___ no action

9.11 Has a new 5 pt. initial calibration curve been generated for those PCB analytes which failed in the calibration verification/continuing calibration standard (8000B, section 7.7.3), and all samples which followed the out-of-control

7

PCB ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Instrument ID: SECD04 CalibrationDate: 02/14/11 Time: 1258

CCV ID: CCV951189 Lab File ID: 1254CCV1.D Init. Calib. Date Begin: 02/10/11 End: 02/13/11

GC Column: STX-CLP2 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
1254-1	2507131.8	2103720	16.1	AVRG
1254-2	2706910.4	2255350	16.7	AVRG
1254-3	2055438	1688510	17.9	AVRG
1254-4	4552664.5	3615010	20.6	AVRG
1254-5	2767130.8	2329460	15.8	AVRG
		Average Used:	17.4	

<- NO Avg < 20%

7

PCB ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Instrument ID: SECD04 CalibrationDate: 02/14/11 Time: 1559

CCV ID: CCV951202 Lab File ID: ACCV2.D Init. Calib. Date Begin: 02/10/11 End: 02/13/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
1260-1	4793066.1	4802620	0.2	AVRG
1260-2	8311974.4	7919930	4.7	AVRG
1260-3	7567924.6	8091240	6.9	AVRG
1260-5	10214508	9998430	2.1	AVRG
1016-1	3401564.7	3897010	14.6	AVRG
1016-2	7053800.3	8700120	23.3	AVRG
1016-3	3007245.3	3353890	11.5	AVRG
1016-4	2893564	3166300	9.4	AVRG
1016-5	1719521.1	1893590	10.1	AVRG
1260-4	20944279	21427900	2.3	AVRG
==========				
Decachlorobiphenyl(SURR)	26377561	26206920	0.6	AVRG

Average Used: 7.8

<- NQ Avg < 20

180311 1924

FORM VII

7

PCB ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Instrument ID: SECD04 CalibrationDate: 02/14/11 Time: 1700

CCV ID: CCV951204 Lab File ID: ACCV3.D Init. Calib. Date Begin: 02/10/11 End: 02/13/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
1260-1	4793066.1	4685170	2.3	AVRG
1260-2	8311974.4	7737530	6.9	AVRG
1260-3	7567924.6	7756980	2.5	AVRG
1260-5	10214508	9952990	2.6	AVRG
1016-1	3401564.7	3571960	5.0	AVRG
1016-2	7053800.3	8537500	21.0	AVRG
1016-3	3007245.3	3170050	5.4	AVRG
1016-4	2893564	2976930	2.9	AVRG
1016-5	1719521.1	1808060	5.1	AVRG
1260-4	20944279	21367840	2.0	AVRG
==========	==========	==========	==========	==========
Decachlorobiphenyl(SURR)	26377561	25842240	2.0	AVRG

Average Used: 5.2

<- NQ Avg < 20

Yes NO N/A

calibration verification/standard continuing calibration Standard? [ ] ___ ✓

+/-20%
~~± 15%~~

ACTION: If the %D for any analyte exceeded the criterion and the instrument was not recalibrated for those analytes, qualify positive results for all associated samples (those which followed the out-of-control standard) "J" and sample quantitation limits "UJ". (see Table 9)

9.12 Have retention time (RT) windows been properly calculated for each analyte of interest (Method 8000B, section 7.6), using RTs from the associated calibration verification/continuing standard? [✓] ___ ___

ACTION: If no, take action specified in section 3.2 above

9.13 Do all standard retention times for each calibration verification/continuing calibration standard fall within the windows established during the initial calibration sequence? [✓] ___ ___

9.14 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows. [✓] ___ ___

ACTION: For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use paragraph B below. If the answer to either 9.13 or 9.14 above is no, check the chromatograms of all samples which followed the last in-control standard. If samples were not re-analyzed, all samples analyzed after the last in-control standard must be evaluated using professional judgement.

(A) For non-detected target compounds, check to see if the sample chromatograms contain any peaks that are close to the expected RT window of the Arcolor of interest. If no peaks are present, no qualification of data is necessary. If peaks are present close th RT window of the Aroclor of interest, qualify the non-detected values as presumptively present "N".

345

Yes NO N/A

(B) For detected compounds in the affected samples, if peaks within the RT window, no qualification necessary. If peaks are close to the expected RT window of the Aroclor of interest, the reviewer can examine the data package for the presence of three or more standards the Aroclor of interest that were run within the analytical sequence during which the sample was analyzed. If three or more such standards are present, the RT window can be reevaluated using the Mean Retention Times of the standards. If the peaks in the affectd sample fall within the revised window, qualify the detected target compounds "NJ". If the reviewer cannot do anything with the data to resolve the problem of concern, qualify all non-detects as unusable "R". (Table 9)

9.15 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence sequence (closing CCV). (Table 9) [V] ___ ___

Table 9. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	**Non-Detected Associated Compounds**
RT out of RT window	Use professional judgement (Sec 9.14)	
%D not within +/- 15%	J	UJ
Time elapsed greater than section 9.15 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.16 Are there any transcription/calculation errors between raw data and data summary forms? ___ [V] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [V] ___ ___

Yes NO N/A

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

10.3 Were the TCMX/DCB surrogate RTs for the samples within the mean surrogate RT from the initial calibration? [✓] ___ ___

Action: If no, see "Action" in section 9.14 above

11.0 Extraction Techniques for Sample Preparation

Method 8082A permits a variety of extraction techniques to be used for sample preparation. Check which extraction procedure was used?

1. Aqueous samples:

    1. Separatory funnel (Method 3510) [✓] ___ ___
    2. Continuous liquid-liquid extraction (Method 3520) [ ] ___ ___
    3. Solid phase extraction (Method 3535) [ ] ___ ___
    4. Other [ ] ___ ___

2. Solid samples:

    1. Soxhlet (Method 3540) [ ] ___ ___
    2. Automated Soxhlet (Method 3541) [ ] ___ ___
    3. Pressurized fluid (Method 3545) [ ] ___ ___
    4. Microwave extraction (Method 3546) [ ] ___ ___
    5. Ultrasonic extraction (Method 3550) [✓] ___ ___

Yes NO N/A

6. Supercritical fluid (Method 3562) [ ] ___ ___

7. Other [ ] ___ ___

11.1 Extract Cleanup - Efficiency Verification (Form IX/Equivalent)

11.1.1 Method 8082 (section 7.2) references method 3660 (sulfur) and 3665A (sulfuric acid) to use for cleaning extracts. Were one or both method used? [✓] ___ ✓

GPC 41911

ACTION: If no, take action specified in 3.2 above. If data suggests cleanup was not performed, make note in the data assessment.

NOTE: Method 3620A, Florisil, may be used per approved project QA plan. The method does not list which analytes and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct PCB list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.2 Are all samples listed on modified CLP PCBs Florisil/Cartridge Check Form? [ ] ✓ ___

ACTION: If no, take action specified in 3.2 above.

11.3 Was GPC Cleanup (method 3640A) performed? [ ] ✓ ___

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.4 Were the same PCB analytes used in calibration used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.5 Are percent recoveries (% R) of the PCBs and surrogate compounds used to check the efficiency of the cleanup procedures within lab's in-house QC limits (use 70-130% if not available). [ ] ___ ✓

Yes NO N/A

70-130% for GPC calibration? [ ] ___ ✓

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 70%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for PCBs. Use professional judgement to qualify positive results if recoveries are greater than the upper limit.

12.0 PCB Identification

12.1 Has CLP Form X or equivalent, showing retention time data for positive results on the two GC columns, been completed for every sample in which a PCB was detected? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and cleanup verification forms)? ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both columns/analyses? [✓] ___ ___

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

Initial Calibration Date: 2/10/11-2/13/11, on STX-CLP1
RRF and %RSD Calculations:

Compound Name: AR1260 peak 2 in level 2
Lab Value: 8834600.0000

Area of Compound	176692
Conc. of Compound	0.02
Calculated CF	8834600.000

Compound Name: AR1260 Peak 2
Lab Value: 10.2

CF of STD 1	9755833.333
CF of STD 2	8834600.000
CF of STD 3	8231710.000
CF of STD 4	7482520.000
CF of STD 5	7794005.000
CF of STD 6	7773178.000
CF of STD 7	
CF of STD 8	
Calculated % RSD	10.22

Continuing Calibration File ID: 2/14/11, 1258, STX-CLP2
RRF and %D Calculations:

Compound Name: AR1254 Peak 1
Lab Value: 3021780.0000

Area of Compound	302178
Conc. of Compound	0.1
Calculated CF	3021780.000

Compound Name: AR1254 Peak 1
Lab Value: 12.9

Average CF	3467952.100
CF of CCV	3021780
Calculated % D	12.9

Yes NO N/A

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently.
Were there any false negatives? ___ ☑ ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation provided when sample concentration was sufficient (> 10 ug/ml) in the final extract? [ ] ___ ✓

ACTION: Indicate with red pencil which Form I results were confirmed by GC/MS and also note in data assessment. GC/MS confirmation is an option, see section 7.10 of Method 8082A-20. If GC/MS confirmation is not available, follow action in section 3.2.

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%~~? 40%? per method ☑ ___ ___

See Form 10s

NOTE: The method requires quantitation from one column. The second column is to confirm the presence of an analyte. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier

10

PCB ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.: VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Lab Sample ID: 350199307 Date(s) Analyzed: 02/14/11 02/14/11

Instrumet ID (1): SECD04 Instrumet ID (2): SECD04

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D
Aroclor-1254	*	1	15.000	15.000	0.000	222733	0.042	30	
		2	15.000	15.000	0.000	236917	0.081	56	60.47
Decachlorobiphenyl	*	1	8.350	8.360	0.010	1812116	0.069	47.8	
		2	8.678	0.000	0.000	994739	0.074	51.3	7.06

J

* Column used for quantitation

10

PCB ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.: VWW06-SD0010-0211

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Lab Sample ID: 350199311 Date(s) Analyzed: 02/14/11 02/14/11

Instrumet ID (1): SECD04 Instrumet ID (2): SECD04

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D
Aroclor-1254	*	1	15.000	15.000	0.000	596089	0.075	48	
		2	15.000	15.000	0.000	108427	0.037	24	66.67 J
Decachlorobiphenyl	*	1	8.352	8.360	0.008	1273717	0.048	31.1	
		2	8.680	0.000	0.000	635702	0.047	30.3	2.61

* Column used for quantitation

10

PCB ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.

VWW06-SD0011-0211

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Lab Sample ID: 350199312 Date(s) Analyzed: 02/14/11 02/14/11

Instrumet ID (1): SECD04 Instrumet ID (2): SECD04

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D
Aroclor-1254	*	1	15.000	15.000	0.000	836370	0.097	42	
		2	15.000	15.000	0.000	122829	0.042	18	80.00 NJ
Decachlorobiphenyl	*	1	8.351	8.360	0.009	2085674	0.079	33.7	
		2	8.679	0.000	0.000	1055615	0.078	33.3	1.19

* Column used for quantitation

Yes NO N/A

0-~~25%~~ 40%	none
40~~26~~-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected)	"NJ"
>50% (PCBs value is <CRQL)	"U"
>200%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that he higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ [✓] ___

NOTE: Single-peak PCBs results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? [✓] ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

SAMPLE CALCULATION

Sample ID: VWW6-SD009-0211
Standard ID: ICAL 2/10-13/11
Compound: AR1260
Concentration: 260 ug/Kg (sum of 5 peaks)
Calculation shows Peak 1: 16.9 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		47525
CF of Compound		3467952.083
Final Volume		10
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	25.28
Initial Volume of Sample		NA
Conversion Factor		1000
Percent Solids Factor		0.321
Concentration	#DIV/0!	16.88756

Peak #	Concentration
1	16.9
2	39.85
3	11.27
4	129.85
5	61.39
Total	**259.26**

Yes NO N/A

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? ☑ ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ ☑ ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for PCB analysis? ☑ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made

Yes NO N/A

to determine the proper identification of field duplicates.

SD006 / SD006P 25U / 30JP 200% +8% RPD NQ *

SD0011 / SD0011P 42P / 120 OK as 96% RPD

J + in both

* No quals required due to low conc. of detect in dup sample.

35Ø1993 R1
metals/mercury

SOP: HW-2 Revision 13 Appendix A.1 Sept. 2006

	YES	NO	N/A
A.1.1 **Contract Compliance Screening Report** Present?	[ ]	___	✓
ACTION: If no, contact RSCC/PO.			
A.1.2 **Record of Communication (from RSCC)** Present?	[ ]	___	✓
ACTION: If no, request from the RSCC.			
A.1.3 **Sampling Trip Report** Present and complete?	[ ]	___	✓
ACTION: If no, contact RSCC/PO.			
A.1.4 **Chain of Custody/Sample Traffic Report** Present?	✓	___	___
Legible?	✓	___	___
Signature of sample custodian present?	✓	___	___
ACTION: If no, contact RSCC/WAM/PO.			
A.1.5 **Cover Page** Present?	✓	___	___
Is the Cover Page properly filled in and the verbatim signed by the lab manager or the manager's designee?	✓	___	___
Do the sample identification numbers on the Cover Page agree with sample Identification numbers on:			
(a) Traffic Report Sheet? * see COC correction memo p 1087 - 2 IDs corrected	✓	___	___

NOT CLP

355

	YES	NO	N/A
(b) Form I's?	[✓]	___	___
Is the number of samples on the Cover Page the same as the number of samples on the Traffic Report sheet and the Regional Record of Communication (ROC) for the data Case?	[___]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact RSCC/PO for re-submittal of the corrected Cover Page from the laboratory.

Not CLP - not CLP forms

A.1.6 **SDG Narrative, DC-1 & DC-2 Form**

Is the SDG Narrative present?	[✓]	___	___
Is Sample Log-In Sheet(Form DC-1) present and complete?	[✓]	___	___
Is Complete SDG Inventory Sheet(Form DC-2) present and complete?	[✓]	___	___

ACTION:
If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.

A.1.7 **Form I to XV**

A.1.7.1 Are all the Form I through Form XV labeled with:

Laboratory Name?	[✓]	___	___
Laboratory Code?	[✓]	___	___
RAS/Non-RAS Case No.?	[___]	___	NA
SDG No.?	[✓]	___	___

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Soil samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3050B.
Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB950235 was analyzed on 02/15/11 09:14. The following analyte(s) were detected below RL: Aluminum at 28 UG/L, Barium at 0.376 UG/L, Beryllium at 0.301 UG/L, Iron at 36.7 UG/L, Magnesium at 22.3 UG/L, Manganese at -0.422 UG/L.
CCB950242 was analyzed on 02/15/11 13:26. The following analyte(s) were detected below RL: Aluminum at 14.8 UG/L, Beryllium at 0.135 UG/L, Iron at 12 UG/L, Magnesium at 11.6 UG/L, Manganese at -0.718 UG/L, Nickel at -1.12 UG/L.
CCB950254 was analyzed on 02/15/11 14:23. The following analyte(s) were detected below RL: Aluminum at 15 UG/L, Iron at 10.9 UG/L, Manganese at -0.738 UG/L.

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

CCB950266 was analyzed on 02/15/11 15:23. The following analyte(s) were detected below RL: Aluminum at 13 UG/L, Beryllium at 0.186 UG/L, Iron at 14.8 UG/L, Magnesium at 11.9 UG/L, Manganese at -0.601 UG/L.

ICB952155 was analyzed on 02/18/11 12:35. The following analyte(s) were detected below RL: Manganese at -1.57 UG/L.
CCB952184 was analyzed on 02/18/11 15:13. The following analyte(s) were detected below RL: Aluminum at 10.9 UG/L, Iron at 5.77 UG/L, Manganese at -2.09 UG/L.
CCB952196 was analyzed on 02/18/11 16:09. The following analyte(s) were detected below RL: Aluminum at 21.6 UG/L, Beryllium at 0.237 UG/L, Iron at 29 UG/L, Magnesium at 10.1 UG/L, Manganese at -1.77 UG/L.
CCB952208 was analyzed on 02/18/11 17:00. The following analyte(s) were detected below RL: Aluminum at 15 UG/L, Beryllium at 0.162 UG/L, Iron at 14.2 UG/L, Magnesium at 9.83 UG/L, Manganese at -1.94 UG/L.
CCB952220 was analyzed on 02/18/11 17:54. The following analyte(s) were detected below RL: Aluminum at 10.1 UG/L, Beryllium at 0.124 UG/L, Iron at 7.36 UG/L, Manganese at -1.68 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. Method Blanks:

All acceptance criteria were met with the exception of:
Blank 70433MB was analyzed with the soil samples on 02/18/11. The following analyte(s) were detected below RL: Iron at 1880 UG/KG. The hit in the blank is below the RL, therefore, no corrective action was taken.
Samples coded accordingly.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350199703A was analyzed with the water samples on 02/15/11. The following analyte(s) were recovered below criteria: Sodium at 52.1 % with criteria of (80-120). and the following analyte(s) were recovered above criteria: Aluminum at 131.5 % with criteria of (80-120), Beryllium at 126.7 % with criteria of (80-120), Calcium at 125.7 % with criteria of (80-120), Iron at 125.7 % with criteria of (80-120), Magnesium at 128.6 % with criteria of (80-120), Manganese at 124.4 % with criteria of (80-120), Potassium at 132.8 % with criteria of (80-120), Selenium at 125.9 % with criteria of (80-120), Vanadium at 126.5 % with criteria of (80-120). The PDS is associated with the QC for a different SDG. The LCS/LCSD pass all quality control criteria. No further action was taken.

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SD003-0211MS (at a 10X dilution) was analyzed with the soil samples on 02/18/11. The following analyte(s) were recovered below criteria: Antimony at 65.8 % with criteria of (80-120), Calcium at 19.8 % with criteria of (80-120), Manganese at 33.6 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 128.9 % with criteria of (80-120), Copper at 146.2 % with criteria of (80-120), Iron at 225.3 % with criteria of (80-120), Lead at 171.9 % with criteria of (80-120), Magnesium at 121.9 % with criteria of (80-120), Sodium at 154.2 % with criteria of (80-120), Zinc at 306.3 % with criteria of (80-120).

SD - VWW06-SD003-0211SD (at a 10X dilution) was analyzed with the soil samples on 02/18/11. The following analyte(s) were recovered below criteria: Antimony at 58.8 % with criteria of (80-120), Calcium at 0 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 168.1 % with criteria of (80-120), Copper at 492.8 % with criteria of (80-120), Iron at 333.3 % with criteria of (80-120), Lead at 347.8 % with criteria of (80-120), Magnesium at 142.2 % with criteria of (80-120), Manganese at 128.4 % with criteria of (80-120), Nickel at 144.5 % with criteria of (80-120), Sodium at 186.3 % with criteria of (80-120), Vanadium at 129.2 % with criteria of (80-120), Zinc at 573.5 % with criteria of (80-120). The following analyte(s) exceeded RPD criteria: Copper at 55.8 % with criteria of (20). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the parent sample being saturated with Strontium and diluted 10X. The sample required dilutions to get the Internal Standard to pass and required dilutions for Calcium. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350199301L was analyzed with the soil samples on 02/18/11. The following analyte(s) exceeded criteria: Nickel at 48 % with criteria of (10). The most probable cause for the SD exceeding limits is sample matrix due to the parent sample being saturated with Strontium and diluted 10X. The sample required dilutions to get the Internal Standard to pass and required dilutions for Calcium. No further action was taken.

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

Serial Dilution 350199703L was analyzed with the water samples on 02/15/11. The following analyte(s) exceeded criteria: Aluminum at 82 % with criteria of (10), Barium at 69 % with criteria of (10), Beryllium at 270 % with criteria of (10), Iron at 90 % with criteria of (10), Magnesium at 56 % with criteria of (10). The SD is associated with the QC for a different SDG, therefore, no corrective action was taken.
Samples coded accordingly.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.

Sample VWW06-SD0010-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD0011-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD0011P-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD003-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD004-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD005-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD006-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD006P-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD007-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD008-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium
Sample VWW06-SD009-0211 required a 10X dilution due to high concentration of the following analyte(s): Calcium

The samples also required a 10X dilution due to the samples being saturated with Strontium causing the Internal Standard to exceed limits. All data reported from the diluted runs with passing Internal Standard.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/09/2011

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7470A.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7470A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350199703A was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

58.3 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to LCS/LCSD passing all quality control criteria. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

No spikes requested by client.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Samples were analyzed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7471A.

IV. PREPARATION

Soil samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7471A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met.

3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/09/2011

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : PEL Laboratories Inc.

Project: Vieques

Laboratory Workorder / SDG #: K0204

SW846 6020A

I. SAMPLE RECEIPT

No exceptions or unusual conditions were encountered unless a Sample Condition Notification Form, or other record of communication is included with the Sample Receipt Documentation.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

III. METHODS

Samples were analyzed following procedures in laboratory test code: SW846 6020A

IV. PREPARATION

Aqueous Samples were prepared following procedures in laboratory test code: ICP_MS_W_PR(3005A)
Soil Samples were prepared following procedures in laboratory test code: ICP_MS_S_PR(3050B)

V. INSTRUMENTATION

The following instrumentation was used to perform
Instrument Code: X1
Instrument Type: ICPMS
Description: X1
Manufacturer: ThermoFisher
Model: X-Series 2

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

Method blanks were within the acceptance criteria.

C. Spikes:

1. Laboratory Control Spikes (LCS):

Percent recoveries for lab control samples were within the QC limits.

2. Matrix spike (MS):

Matrix spike was performed on sample: VWW06-SD003-0211 (K0204-01AMS). Percent recoveries were within the QC limits.

D. Duplicate sample:

Duplicate analysis was performed on sample: VWW06-SD003-0211 (K0204-01ADUP). Relative percent differences were within the QC limits.

E. Serial Dilution (SD):

Serial Dilution analysis was performed on sample: VWW06-SD003-0211 (K0204-01ASD). Percent differences were within the QC limits.

G. Samples:

All soil samples and associated QC samples were diluted five fold

prior to analysis. This is expressed as a 500mL final volume for reporting purposes.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed: Edward A. Lado

Date: 3/7/11

		YES	NO	N/A
	Contract No.?	☑		

ACTION:
If no for any of the above, note under Contract Problem/Non-Compliance Section of the "Data Review Narrative" and contact PO for corrected Form(s) from the laboratory.

A.1.7.2	After comparing values on Forms I-IX against the raw data, do any computation/ transcription errors exceed 10% of the reported values on the Forms for:			
	(a) all analytes analyzed by ICP-AES?		☑	
	(b) all analytes analyzed by ICP-MS?		☑	
	(c) Mercury?		☑	
	(d) Cyanide?			☑

ACTION:
If yes, prepare Telephone Record Log and contact CLP PO/TOPO for the corrected data from the laboratory.

A.1.8 Raw Data

Data shall not be validated without the hard/electronic copies of the associated raw data for samples and QC samples.

A.1.8.1 Digestion/Distillation Log

Digestion Log for ICP-AES (Form XII)present?	☑		
Digestion Log for ICP-MS (Form XII) present?	☑		
Digestion Log for mercury (Form XII) present?	☑		
Distillation Log for cyanide (Form XII) present?			☑
Are pH values for metals and			

376

	YES	NO	N/A
cyanide reported for each aqueous sample?	☑		
Are percent solids calculations present for soils/sediments? values present - not validated.	☑		
Are preparation dates present on the sample preparation logs/bench sheets?	☑		

NOTE:
Digestion/Distillation log must include weights, volumes, and dilutions used to obtain the reported results.

A.1.8.2 Is the analytical instrument real-time printouts present for:

	YES	NO	N/A
ICP-AES?	☑		
ICP-MS?	☑		
Mercury?	☑		
Cyanide?	☐		☑

Are all laboratory bench sheets and instrument raw data printouts necessary to support all sample analyses and QC operations:

	YES	NO	N/A
Legible?	☑		
Properly labeled?	☑		

Are all field samples, QC samples and field QC samples present on:

	YES	NO	N/A
Digestion/Distillation log?	☑		
Instrument Printouts?	☑		

ACTION:
If no for any of the above questions in Section A.1.8.1 and Section A.1.8.2, write Telephone Record Log and contact TOPO/PO for re-submittal from the laboratory.

		YES	NO	N/A
A.1.9	**Technical Holding Times**: (Aqueous and soil samples) (Examine sample Traffic Reports and digestion/distillation logs to determine the holding time from the sample collection date to the sample preparation date.)			
A.1.9.1	Cyanide distillation(14 days)exceeded?	_	[ ]	✓
	Mercury analysis(28 days) exceeded?	_	[✓]	_
	Other Metals analysis(180 days)exceeded? ___	___	[✓]	_

ACTION:
If yes, reject (R) and red-line non-detects and flag as estimated (J)results ≥ MDL even if sample(s) was preserved properly.

NOTE:
In addition to qualifying the data, a list of all samples and analytes which exceeded the holding times must be prepared. Report for each sample the number of days that were exceeded. (Subtract the sample collection date from the sample preparation date). Attach this list to the data review narrative.

A.1.9.2	Is pH of aqueous samples for:			
	Metals Analysis ≤ 2?	[✓]	___	___
	Cyanide Analysis ≥ 12?	[ ]	_	✓

ACTION:
If no for any of the above, flag non-detects as "R" and detects as "J".

A.1.9.3	Is the cooler temperature ≤ 10 C°?	[ ]	✓	_

ACTION:
If cooler temperature is >10 °C , flag non-detects as "UJ" and detects as "J".

One cooler received at 9.9°C & one at 10.5°C – see report for list of affected samples, All were flagged JUJ based on SAP criteria of +/- 2°C.

A.1.10 **Final Data Correctness - Form I**

A.1.10.1 Are Form I's for all samples

ICP - AES	
SAMPLE ID	VWW06-SD003-0211
ANALYTE	lead
Lab Value CONCENTRATION (ug/Kg)	442000
AMOUNT FROM RAW DATA (ug/L)	432
SAMPLE SIZE (g)	0.94
FINAL VOLUME (L)	0.05
DILUTION FACTOR	10
DRYNESS FACTOR	0.52
CONVERSION FACTOR (g TO Kg)	1000
CALCULATED CONCENTRATION (ug/Kg)	441899

FIMS	
SAMPLE ID	VWW06-SD006-0211
ANALYTE	mercury
Lab Value CONCENTRATION (ug/Kg)	28.8
AMOUNT FROM RAW DATA (ug/L)	0.339
SAMPLE SIZE (g)	0.498
FINAL VOLUME (L)	0.025
DILUTION FACTOR	1
DRYNESS FACTOR	0.591
CONVERSION FACTOR (g TO Kg)	1000
CALCULATED CONCENTRATION (ug/Kg)	28.8

ICP-MS	
SAMPLE ID	VWW06-SD004-0211
ANALYTE	arsenic
Lab Value CONCENTRATION (mg/Kg)	2.4
AMOUNT FROM RAW DATA (ug/L)	2.611
SAMPLE SIZE (g)	1.02
FINAL VOLUME (L)	0.1
DILUTION FACTOR	5
DRYNESS FACTOR	0.53
CONVERSION FACTOR (ug/g to mg/Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	2.4

	YES	NO	N/A
present and complete?	[✓]	___	___

ACTION:
If no, prepare Telephone Record Log and contact CLP PO/TOPO for submittal from the laboratory.

A.1.10.2 Verify there are no calculation and transcription errors in the results reported on Form I's. Circle on each Form I all results that are incorrect.

Is the calculation error less than 10% of the correct result?	[___]	_	✓
Are results on Form I's reported in correct units (ug/L for aqueous and MG/KG for soils)?	[✓]	___	___
Are results on Form I'S reported by correct significant figures?	[✓]	___	___
Are soil sample results on Form I's corrected for percent solids?	[✓]	___	___
Are all "less than MDL" values reported by the ~~CRQLs~~ LOQ's and coded with "U"? (per project SAP)	[✓]	___	___
Are values less than the ~~CRQLs~~ LOQ's but greater than or equal to the MDLs flagged with "J"?	[✓]	___	___
Are appropriate contractual quality control and Method qualifiers used?	[✓]	___	___

ACTION:
If no for any of the above questions, prepare Telephone Record Log, and contact CLP PO/TOPO for corrected data.

A.1.10.3 Do EPA sample identification numbers and the corresponding laboratory sample identification numbers match on the Cover Page, Form I's and in the raw data? [✓] ___ ___

Was a brief physical description

		YES	NO	N/A
	of the samples before and after digestion given on the Form I's?	[ ]	✓	
	Was any sample result outside the mercury/cyanide calibration range or the ICP-AES/ICP-MS linear range diluted and noted on the Form I?	[✓]		
	ACTION: If no for any of the above, note under the Contract-Problem/Non-Compliance Section of the Data Review Narrative.			

Dilutions were performed as necessary due to high Ca results & IS %R issues due to interference

A.1.11 **Initial Calibration**

A.1.11.1	Is a record of at least 2 point (A blank and a standard)calibration present for ICP-AES analysis?	[✓]		
	Is a record of at least 2 point (a blank and a standard)calibration present for ICP-MS analysis?	[✓]		
	Is a record of at least 5 point calibration (a blank & 4 standards)present for Hg analysis?	[✓]		
	Is a record of at least 4 point calibration (a blank & 4 standards)present for cyanide?	[ ]		✓
	ACTION: If incomplete or no initial calibration was performed, reject (R) and red-line the associated data (detects & non-detects).			
	Is one initial calibration standard at the CRQL level for cyanide and mercury?	[✓]		
	ACTION: If no, write in the Contract Problem/ Non-Compliance Section of the Data Review Narrative.			
A.1.11.2	Is the curve correlation coefficient $\geq$ 0.995 for:			

		YES	NO	N/A
	Mercury Analysis?	[✓]	___	___
	Cyanide Analysis?	[___]	___	✓ ___
	ICP-AES (more than 2 point Calib.)?	[✓]	___	___
	ICP-MS (more than 2 point calib.)?	[✓]	___	___

ACTION:
If no, qualify the associated sample results ≥ MDL as estimated "J" and non-detects as "UJ".

NOTE:
The correlation coefficient shall be calculated by the data validator using standard concentrations and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.12 Initial and Continuing Calibration Verification- Form IIA

A.1.12.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for ICP-AES and ICP-MS when both these methods were used for the same analyte?	[✓]	___	___

ACTION:
If no for any of the above, prepare a Telephone Record Log and contact PO/TOPO for re-submittal from the laboratory.

A.1.12.2	Was a Continuing Calibration Verification performed every 10 samples or every 2 hours whichever is more frequent?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.12.3	Was an ICV or a mid-range standard distilled and analyzed with each batch of cyanide samples?	[___]	___	✓ ___

no CN present

	YES	NO	N/A

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative and qualify results ≥ MDL as estimated (J).

A.1.12.2 Circle on each Form IIA all percent recoveries that are outside the contract windows.

Are ICV/CCVs within control limits for:

Metals - 90-110%R?	[✓]	___	___
Hg - 80-120%R?	[✓]	___	___
Cyanide - 85-115%R?	[___]	___	✓

ACTION:
If no, qualify all samples between a previous technically acceptable CCV standard and a subsequent technically acceptable CCV standard as follows as follows:

Qualify as estimated (J) all detects and non-detects, if the ICV/CCV %R is between 75-89%(65-79% for Hg; 70-84% for CN). Qualify only positive results(≥ MDL) as "J" if the ICV/CCV %R is between 111-125%(121-135% for Hg;116-130% for CN). Reject (R) and red-line only detects if the recovery is greater than 125% (135% for Hg; 130% for CN). Reject (R) and red-line all associated results (hits and non-detects)if the recovery is less than 75%(65% for Hg;70% for CN).

NOTE:
For ICV that does not fall within the acceptance limits, qualify all samples reported from the analytical run.

A.1.12.3 Was the distilled ICV or mid-range standard for cyanide within acceptance limits (85-115%)? [___] ___ ✓

no CN analyzed

ACTION:
If no, Qualify all cyanide results ≥ MDL as "J".

A.1.13 **CRQL Standard Analysis - Form IIB**

A.1.13.1 For each ICP-AES run, was a CRI

	YES	NO	N/A
(CRQL or MDL when MDL > CRQL) standard analyzed? (Note:CRI is not required for Al, Ba, Ca, Fe, Mg, Na and K.)	[✓]	___	___
For each ICP-MS run, was a CRI (CRQL or MDL when MDL > CRQL) standard analyzed for each mass/isotope used for the analysis?	[✓]	___	___
For each mercury run, was a CRQL standard analyzed?	[___]	* ✓	___
For each cyanide run, was a CRQL standard analyzed?	[___]	___	✓

Resub tabulating recoveries requested & received.

* lab runs a digested ICAL Std at the RL. Met +/-30% Criteria.

ACTION:
If no for any of the above, write this deficiency in the Contract Problems/ Non-Compliance Section of the Data Review Narrative, inform CLP PO and flag results in the affected ranges (detects <2xCRQL)as J and non-detects UJ.

sample required by SW 846 methods at beginning of runs only.

The affected ranges are:
ICP-AES Analysis - *True Value ± CRQL
ICP-MS Analysis - *True Value ± CRQL
Mercury Analysis - *True Value ± CRQL
Cyanide Analysis - *True Value ± CRQL
* True value of the CRQL Standard

A.1.13.2 Was a CRQL standard analyzed after the ICV/ICB, before the final CCV/CCB and once every 20 analytical samples in the analytical run for each analysis? [___] ___ ✓

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the "Data Review Narrative".

A.1.13.3 Circle on each Form IIB all percent recoveries that are outside the acceptance windows.

381

Jacqueline Cleveland

From: Edward Lawler [Mitkem] [elawler@mitkem.com]
Sent: Wednesday, April 13, 2011 1:28 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020
Attachments: PEL_VIEQUES-LLICV.metals.xls

Jackie—

Attached is an Excel file containing all the Low Level ICVs (LLICVs) for the Vieques SDGs for Method 6020.

This is right out of our database. There is a separate section of the spreadsheet for each ICP/MS run, also identifying which Mitkem SDGs were analyzed in that run.

These data probably include extra elements, which were included for other samples analyzed in the same run.

Please let me know if you have any questions, or need any additional information.

--Ed

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 6:27 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Thanks Ed,

I will wait for the summary pages!

Jackie

From: Edward Lawler [Mitkem] [mailto:elawler@mitkem.com]
Sent: Tuesday, April 12, 2011 4:03 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Hi Jackie—

That check standard is included in all of the SDGs. We call it the Low Level ICV (or LLICV). Our CLP-type inorganics data reporting software doesn't have a form to report these on, so they are included in the raw data for each SDG, but not on the reporting forms.

For example, in Mitkem SDG K0204, the LLICV is listed as the 10th run on page 0064, and the raw data for this run are on page 0092—but this data is somewhat difficult to follow.....

We are working on something to get you the summaries of %recoveries, which I will hopefully have to you tomorrow.

--Ed

382

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:25 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU 6 Metals by 6020

Good Afternoon Ed,

I am doing data validation for CH2M HILL for the Vieques SWMU 6 data for which you were subcontracted to perform the 6020 metals analyses. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects Work Order #s K0204, K0225, K0205, K0201 & K0215. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

K0204 X1_110223A

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Arsenic	2.30064728	2	2.30064728	2.3	2	0.19	0.5	2	115.03%		70	130
A	Y	Chromium	2.01545733	2	2.01545733	2	2	0.16	0.5	2	100.77%		70	130
A	Y	Selenium	5.66130075	5	5.66130075	5.7	5	0.15	0.5	5	113.23%		70	130

K0201 X1_110216B

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Aluminum	21.0027562	20	21.0027562	21	20	2.9	5	20	105.01%		70	130
A	Y	Antimony	2.12426401	2	2.12426401	2.1	2	0.2	0.2	2	106.21%		70	130
A	Y	Arsenic	2.00593914	2	2.00593914	2	2	0.19	0.5	2	100.30%		70	130
A	Y	Barium	10.0122643	10	10.0122643	10	10	1.3	3	10	100.12%		70	130
A	Y	Beryllium	1.00140666	1	1.00140666	1	1	0.072	0.2	1	100.14%		70	130
A	Y	Cadmium	1.00829914	1	1.00829914	1	1	0.084	0.2	1	100.83%		70	130
A	Y	Calcium	472.76306	500	472.76306	470	500	24	38	500	94.55%	J	70	130
A	Y	Chromium	2.03706028	2	2.03706028	2	2	0.16	0.5	2	101.85%		70	130
A	Y	Cobalt	1.06535199	1	1.06535199	1.1	1	0.024	0.1	1	106.54%		70	130
A	Y	Copper	2.15205123	2	2.15205123	2.2	2	0.23	0.6	5	107.60%	J	70	130
A	Y	Iron	192.148667	200	192.148667	190	200	14	40	200	96.07%	J	70	130
A	Y	Lead	0.97907404	1	0.97907404	0.98	1	0.068	0.2	1	97.91%	J	70	130
A	Y	Magnesium	527.600786	500	527.600786	530	500	7.8	12	500	105.52%		70	130
A	Y	Manganese	5.4470818	5	5.4470818	5.4	5	0.83	1	5	108.94%		70	130
A	Y	Nickel	1.0502218	1	1.0502218	1.1	1	0.17	0.25	1	105.02%		70	130
A	Y	Potassium	484.529478	500	484.529478	480	500	14	40	500	96.91%	J	70	130
A	Y	Selenium	5.36275801	5	5.36275801	5.4	5	0.15	0.5	5	107.26%		70	130
A	Y	Silver	1.01190753	1	1.01190753	1	1	0.022	0.05	1	101.19%		70	130
A	Y	Sodium	487.672118	500	487.672118	490	500	33	50	500	97.53%	J	70	130
A	Y	Thallium	0.9840832	1	0.9840832	0.98	1	0.048	0.1	1	98.41%	J	70	130
A	Y	Vanadium	5.4149342	5	5.4149342	5.4	5	0.61	1	5	108.30%		70	130
A	Y	Zinc	5.54426374	5	5.54426374	5.5	5	0.73	1	5	110.89%		70	130

K0201, K0205 X1_110217B

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	2.07949727	2	2.07949727	2.1	2	0.2	0.2	2	103.97%		70	130
A	Y	Arsenic	2.00792532	2	2.00792532	2	2	0.19	0.5	2	100.40%		70	130
A	Y	Cadmium	0.9580971	1	0.9580971	0.96	1	0.084	0.2	1	95.81%	J	70	130
A	Y	Chromium	1.84630224	2	1.84630224	1.8	2	0.16	0.5	2	92.32%	J	70	130
A	Y	Cobalt	0.98179571	1	0.98179571	0.98	1	0.024	0.1	1	98.18%	J	70	130
A	Y	Copper	1.81974453	2	1.81974453	1.8	2	0.23	0.6	5	90.99%	J	70	130
A	Y	Lead	0.95434051	1	0.95434051	0.95	1	0.068	0.2	1	95.43%	J	70	130
A	Y	Silver	0.97534637	1	0.97534637	0.98	1	0.022	0.05	1	97.53%	J	70	130

K0215,
K0225 **X1_110222A**

AT	&T	Analyte	Ra&w.Val	RawSpk	Calc.Val	Final.V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	1.8964567	2	1.8964567	1.9	2	0.2	0.2	2	94.82%	J	70	130
A	Y	Arsenic	2.13301722	2	2.13301722	2.1	2	0.19	0.5	2	106.65%		70	130
A	Y	Barium	10.7561986	10	10.7561986	11	10	1.3	3	10	107.56%		70	130
A	Y	Beryllium	1.03423982	1	1.03423982	1	1	0.072	0.2	1	103.42%		70	130
A	Y	Cadmium	1.04382134	1	1.04382134	1	1	0.084	0.2	1	104.38%		70	130
A	Y	Chromium	1.87146555	2	1.87146555	1.9	2	0.16	0.5	2	93.57%	J	70	130
A	Y	Cobalt	1.06305979	1	1.06305979	1.1	1	0.024	0.1	1	106.31%		70	130
A	Y	Copper	2.20898143	2	2.20898143	2.2	2	0.23	0.6	5	110.45%	J	70	130
A	Y	Iron	195.167776	200	195.167776	200	200	14	40	200	97.58%	J	70	130
A	Y	Lead	1.0698727	1	1.0698727	1.1	1	0.068	0.2	1	106.99%		70	130
A	Y	Nickel	1.01332509	1	1.01332509	1	1	0.17	0.25	1	101.33%		70	130
A	Y	Selenium	5.56241436	5	5.56241436	5.6	5	0.15	0.5	5	111.25%		70	130
A	Y	Silver	1.00087559	1	1.00087559	1	1	0.022	0.05	1	100.09%		70	130
A	Y	Thallium	1.07403596	1	1.07403596	1.1	1	0.048	0.1	1	107.40%		70	130
A	Y	Vanadium	5.44821072	5	5.44821072	5.4	5	0.61	1	5	108.96%		70	130
A	Y	Zinc	5.63784043	5	5.63784043	5.6	5	0.73	1	5	112.76%		70	130

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Wednesday, April 13, 2011 11:08 AM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU6

Jackie:

Good afternoon.

Per our QAO:
The mercury procedures were reviewed. The calibration curve is digested with every batch analyzed. The low cal standard is at 0.2ug/L which is the Reporting Limit.
PEL does not check an LLQC sample regularly at this time but as the low cal standard is at the RL and carried through the entire process any raw data from a cal curve could be used to verify an LLQC.
Using the Raw Data from the regular Hg analysis for SDG 3501977 the recovery for the low cal standard, 0.2ug/L, yielded a 78.3% recovery, meeting the +/-30% criteria.

For example on SDG 3501977, CS1 data can be found in the metals raw data section on page 4531.

Please let me know if you have any questions or concerns.

Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:35 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU6

Good Afternoon John,

I have a request regarding the mercury analysis. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects all 5 SDGs. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. If the standards are there and I am just missing them let me know! Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

	YES	NO	N/A
Is the CRQL standard within control limits for:			
Metals(ICP-AES/ICP-MS)- 70 - 130%?	[✓]	___	___
Mercury- 70 - 130%? see note at * on previous page	[✓]	___	___
Cyanide - 70 - 130%?	[___]	___	✓

ACTION:
If no, flag detects <2xCRQL as "J" and non-detects as "UJ" if the CRQL standard recovery is between 50-69%. Flag(J) only detects <2xCRQL if the recovery is between 131% and ≤180%. If the recovery is less than 150%, reject(R) and red-line non-detects and detects < 2xCRQL, and flag (J) detects between 2xCRQL and ICV/CCV. Reject and red-line only detects <2xCRQL and flag (J)detects ≥ 2xCRQL but < ICV/CCV if the recovery is > 180%.

NOTE:
1. Qualify all field samples analyzed between a previous technically acceptable analysis of the CRQL standard and a subsequent acceptable analysis of the CRQL standard
2. Flag (J) or reject (R) only the final sample results on Form I's when Sample raw data are within the affected ranges and the CRQL standard is outside the acceptance windows.
3. The samples and the CRQL standard must be analyzed in the same analytical run.

A.1.14 Initial and Continuing Calibration Blanks - Form III

		YES	NO	N/A
A.1.14.1	Present and complete for all the instruments used for the metals and cyanide analyses?	[✓]	___	___
	Was an initial Calibration Blank analyzed after ICV?	[✓]	___	___
	Was a continuing Calibration Blank analyzed after every CCV and every 10 samples or every 2 hours, whichever is more frequent?	[✓]	___	___
	Were the ICB & CCB values ≥ MDL but < CRQL reported on Form III and flagged "J" by			

		YES	NO	N/A
	using MDLs from direct analysis(Preparation Method "NP1")? (Check Form III against the raw data)	[✓]	___	___

ACTION:
If no, inform CLP PO/TOPO and make a note in the Contract-Problems/Non-Compliance Section of the "Data Review Narrative".

A.1.14.2 Circle with red pencil on each Form III all Calib. Blank values that are:

≥ MDL but ≤ CRQL

> CRQL

A.1.14.2.1	When MDL < CRQL, is any Calib. Blank value ≥ MDL but ≤ CRQL?	✓	[___]	___

See report for quals in ICP-MS analysis.

ACTION:
If yes, change sample results ≥ MDL but ≤ CRQL to the CRQL with a "U". Do not qualify non-detects.

A.1.14.2.2	When MDL < CRQL, is any Calib. Blank value > CRQL?	*✓	[___]	___

*NO samples were assoc with CCB that exhibited Fe at conc > LOQ. No qual's required

ACTION:
If yes, reject (R) and red line the associated sample results > CRQL but <ICB/CCB Blank Result. Flag as "J" detects > ICB/CCB blank value but < 10xICB/CCB value. Change the sample results ≥ MDL but ≤ the CRQL to CRQL with a "U".

A.1.14.2.3	Is any Calibration Blank value below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated all associated sample results ≥ CRQL but <10xCRQL.

NOTE:

1. For ICB that does not meet the technical QC Criteria, apply the action to all samples

	YES	NO	N/A

reported from the analytical run.
2. For CCBs that do not meet the technical QC criteria, apply the action to all samples analyzed between a previous technically acceptable analysis of CCB and a subsequent technically acceptable analysis of the CCB in the analytical run.,

A.1.15 **Preparation Blank - FORM III**

NOTE: The Preparation Blank for mercury is the same as the calibration blank.

A.1.15.1 Was one Preparation Blank prepared with and analyzed for:

Each Sample Delivery Group (SDG)?	[✓]	___	___
Each batch of the SDG samples digested/distilled?	[✓]	___	___
Each matrix type?	[✓]	___	___
All instruments used for metals and cyanide analyses?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the associated positive data <10xMDL for which the Preparation Blank was not analyzed.

NOTE:
If only one blank was analyzed for more than 20 samples, then the first 20 samples analyzed are not estimated(J), but all additional samples must be qualified (J).

A.1.15.2 Circle with red pencil on each Form III all Prep. Blank values that are:

≥ MDL but ≤ CRQL, and

> CRQL

A.1.15.2.1 When MDL < CRQL, is any preparation blank value ≥ MDL but ≤ CRQL?	___	[✓]	___

ACTION:
If yes, change sample result ≥ MDL

389

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501993

Preparation Blank Matrix (water/soil): SOIL

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/KG

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Aluminum	28	J	33.8	J	14.8	J	15	J	3760	U	P
Antimony									475	U	P
Barium	0.376	J	10	U	10	U	10	U	317	U	P
Beryllium	0.301	J	0.138	J	0.135	J	3.65	U	317	U	P
Cadmium									99	U	P
Calcium	100	U	100	U	100	U	100	U	6530	U	P
Cobalt									99	U	P
Copper									317	U	P
Iron	36.7	J	37.1	J	12	J	10.9	J	1880	J	P
Lead									673	U	P
Magnesium	22.3	J	29	J	11.6	J	100	U	5740	U	P
Manganese	-0.422	J	-0.671	J	-0.718	J	-0.738	J	317	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	7.31	U	CV
Nickel	4.1	U	4.1	U	-1.12	J	4.1	U	317	U	P
Potassium	500	U	500	U	500	U	500	U	9900	U	P
Selenium	9	U	9	U	9	U	9	U			P
Silver									317	U	P
Sodium	300	U	300	U	300	U	300	U	19800	U	P
Thallium	10	U	10	U	10	U	10	U	673	U	P
Vanadium	9	U	9	U	9	U	9	U	317	U	P
Zinc	20	U	20	U	20	U	20	U	653	U	P

NQ

NQ

NQ

NQ

NQ

EB01-020411 is only sample associated.

ICB IDs: CV= ICB948656, P= ICB950235

CCB1 IDs: CV= CCB948658, P= CCB950240

CCB2 IDs: CV= CCB948670, P= CCB950242

CCB3 IDs: CV= CCB948682, P= CCB950254

160311 1925

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501993

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Aluminum			13	J	NQ				18.6	U	P
Antimony											P
Barium			10	U					0.44	U	P
Beryllium			0.186	J	NQ				0.24	U	P
Cadmium											P
Calcium			100	U					78	U	P
Cobalt											P
Copper											P
Iron			14.8	J	NQ				11	U	P
Lead											P
Magnesium			11.9	J	NQ				19.6	U	P
Manganese			-0.601	J	↓				0.7	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.074	U	CV
Nickel			4.1	U					1.86	U	P
Potassium			500	U					143	U	P
Selenium			9	U					8.2	U	P
Silver											P
Sodium			300	U					300	U	P
Thallium			10	U					8.8	U	P
Vanadium			9	U					0.88	U	P
Zinc			20	U					8	U	P

EB01-020411 U only, sample associated

ICB IDs: CV= ICB948567

CCB1 IDs: CV= CCB948694, P= CCB950266

CCB2 IDs: CV= CCB948569

CCB3 IDs: CV= CCB948581

160311 1925

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501993

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	100	U	91	J	11.5	J	10.9	J	NQ		P
Antimony	10.1	U	2.72	J	10.1	U	10.1	U	NQ		P
Barium	10	U	10	U	10	U	10	U			P
Beryllium	3.65	U	0.186	J	0.154	J	3.65	U	NQ		P
Cadmium	5.05	U	5.05	U	5.05	U	5.05	U			P
Calcium	100	U	79.9	J	100 NQ	U	100	U			P
Cobalt	5.05	U	5.05	U	5.05	U	5.05	U			P
Copper	5.05	U	5.05	U	5.05	U	5.05	U			P
Iron	40	U	80.2	=	10.1	J	5.77	J	NQ		P
Lead	8.08	U	8.08	U	8.08	U	8.08	U			P
Magnesium	100	U	61.6	J	100	U	100	U	NQ		P
Manganese	-1.57	J	-1.04	J	-1.11	J	-2.09	J	NQ		P NQ
Mercury			0.2	U							CV
Nickel	4.1	U	4.1	U	-1.04	J	4.1	U	NQ		P
Potassium	500	U	500	U	500	U	500	U			P
Selenium											P
Silver	5.05	U	5.05	U	5.05	U	5.05	U			P
Sodium	300	U	300	U	300	U	300	U			P
Thalllum	10	U	10	U	10	U	10	U			P
Vanadium	9	U	9	U	9	U	9	U			P
Zinc	20	U	20	U	20	U	20	U			P

none assoc none assoc SD003

ICB IDs: P= ICB952155

CCB1 IDs: CV= CCB948591, P= CCB952160

CCB2 IDs: P= CCB952172

CCB3 IDs: P= CCB952184

180311 1925

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501993

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C	5	C	6	C	Prepa-ration Blank	C	M
Aluminum			21.6	J	15	J	10.1	J	NQ		P
Antimony			10.1	U	10.1	U	10.1	U			P
Barium			10	U	10	U	10	U			P
Beryllium			0.237	J	0.162	J	0.124	J	NQ		P
Cadmium			5.05	U	5.05	U	5.05	U			P
Calcium			100	U	100	U	100	U			P
Cobalt			5.05	U	5.05	U	5.05	U			P
Copper			5.05	U	5.05	U	5.05	U			P
Iron			29	J	14.2	J	7.36	J	NQ		P
Lead			8.08	U	8.08	U	8.08	U			P
Magnesium			10.1	J	9.83	J	100	U	NQ		P
Manganese			-1.77	J	-1.94	J	-1.68	J	NQ		P
Mercury											CV
Nickel			4.1	U	4.1	U	4.1	U			P
Potassium			500	U	500	U	500	U			P
Selenium											P
Silver			5.05	U	5.05	U	5.05	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	10	U	10	U			P
Vanadium			9	U	9	U	9	U			P
Zinc			20	U	20	U	20	U			P

SD003

SD004
SD005
SD006
SD006P
SD007
SD008

SD009
SD010
SD011
SD011P

ICB IDs:

CCB1 IDs: P= CCB952196

CCB2 IDs: P= CCB952208

CCB3 IDs: P= CCB952220

180311 1925

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Preparation Blank Matrix (soil/water): WATER Method Blank ID: MB-57447

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

X1_110216B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.475	B	0.320	B	0.483	B	0.459	B	0.405	B	MS
Arsenic	0.226	B	0.190	U	0.190	U	0.190	U	0.500	U	MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U	0.200	U	MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U	1.000	U	MS
Cobalt	0.172	B	0.041	B	0.057	B	0.054	B	0.200	U	MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U	0.500	U	MS
Lead	0.170	B	0.068	U	0.068	U	0.068	U	0.200	U	MS
Silver	0.044	B	0.053	B	0.063	B	0.062	B	0.050	U	MS

No Quals - field rinse blank is only sample associated.

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110216B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.356	B	0.443	B					MS
Arsenic			0.190	U	0.190	U					MS
Cadmium			0.084	U	0.084	U					MS
Chromium			0.160	U	0.160	U					MS
Cobalt			0.079	B	0.081	B					MS
Copper			0.230	U	0.230	U					MS
Lead			0.080	B	0.076	B					MS
Silver			0.088	B	0.087	B					MS

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501993

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0204

Preparation Blank Matrix (soil/water): SOIL Method Blank ID: MB-57563

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

X1_110223A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Arsenic	0.291	B	0.190	U	0.190	U	0.190	U	0.500	U	MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U	0.500	U	MS
Selenium	0.172	B	-0.186	B	0.150	U	0.150	U	0.500	U	MS

all soils assoc.

Se - U @ LOD in SD004 ✓
SD007 ✓
SD009 ✓

		YES	NO	N/A
	but ≤ CRQL to CRQL with a "U".			
A.1.15.2.2	When the MDL ≤ CRQL, is any Preparation Blank value greater than its CRQL?	___	[✓]	___
	If yes, is the Prep. Blank value greater than the value of the associated Field Blank collected and analyzed with the SDG samples?	___	[___]	✓
	If yes, is the lowest concentration of that analyte in the associated samples less than 10 times the Preparation Blank value?	___	[___]	✓

ACTION:
If yes, reject (R) and red-line all associated sample results greater than the CRQL but less than the Prep.Blank value. Flag as "J" detects > Prep. Blank value but <10xPrep.Blank. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

If the Prep. Blank value is less than the same analyte value in the Field Blank, do not qualify the sample results due to the Prep. Blank criteria.

NOTE:
Convert soil sample result to mg/Kg on wet weight basis to compare with the soil Prep. Blank result on Form III.

A.1.15.2.3	Is the Prep. Blank concentration below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) all associated sample results less than 10xCRQL. Qualify non-detects as estimated (UJ).

A.1.15.2.4	When the MDL is greater than the CRQL, is the preparation blank concentration on Form III greater than two times the MDL?	___	[___]	✓

ACTION:

397

		YES	NO	N/A
	If yes, reject (R) and red-line all positive sample results with sample raw data less than 10 times the Preparation Blank value.			
A.1.16	**ICP-AES/ICP-MS Interference Check Sample (ICS) - Form IV** **NOTE:** Not required for CN, Hg, Al, Ca, Fe and Mg.			
A.1.16.1	Present and complete?	[✓]	___	___
	Was ICS analyzed at the beginning and end of each analytical run, and once for every 20 analytical samples?	[___]	___	✓ at beginning only
	Was ICS analyzed at the beginning of the ICP-MS analytical run?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all sample results.			

(Sequence was < 12 hours long)

A.1.16.2	**ICP-AES Method**			
A.1.16.2.1	**ICSA Solution:** For ICP-AES, are the ICSA "Found" analyte values within the control limits ± of CRQL of the true/established mean value?	[✓]	___	___
	If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSA Solution on Form IV?	[___]	___	✓
	ACTION: If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run: Flag (J) as estimated only sample results ≥MDL			

	YES	NO	N/A

for which the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag non-detects as "UJ" and detects as "J".

A.1.16.2.3 **ICSAB Solution**
For ICP-AES, are all analyte results in ICSAB within the control limits of 80-120 of the true/established mean value? [✓] ___ ___

If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSAB Solution on Form IV? [___] ___ ✓

ACTION:
If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79%, qualify sample results ≥ MDL as "J" and non-detects as "UJ". Reject (R) and red-line all sample results (detects & non-detects) for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only positive results.

A.1.16.3 **ICP-MS Method**

A.1.16.3.1 **ICSA Solution:**
For ICP-MS, are the ICSA "Found" analyte values within the control limits of ±CRQL of the true/established mean value? [✓] ___ ___

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated only sample results ≥ MDL if the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag the associated sample detects as "J" and non-detects as "UJ".

		YES	NO	N/A
A.1.16.3.3	**ICSAB Solution** For ICP-MS, are all analyte results in ICSAB within the control limits of 80-120% of the true/established mean value, whichever is greater?	[✓]	___	___

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79% flag (J) as estimated the associated sample results ≥ MDL. Reject (R) and red-line those all sample detects and non-detects for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only detects (≥ MDL).

A.1.17 Spiked Sample Recovery: Pre-Digestion/Pre-Distillation)-Form V A

Note: Not required for Ca, Mg, K, and Na (both matrices); Al and Fe (soil only)

		YES	NO	N/A
A.1.17.1	Was Matrix Spike analysis performed:			
	For each matrix type?	[✓]	___	___
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each concentration range (i.e., low, med., high)?	[✓]	___	___
	For each analytical Method (ICP-AES, ICP-MS, Hg, CN) used?	[✓]	___	___
	Was a spiked sample prepared and analyzed with the SDG samples?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the positive data for which a spiked sample was not analyzed.

VWW06-SD003-0211

NOTE:
If more than one spiked sample were analyzed for one SDG, then qualify the associated data based on the worst spiked sample analysis.

400

		YES	NO	N/A
A.1.17.2	Was a field blank or PE sample used for the spiked sample analysis?	___	[✓]	___
	ACTION: If yes, flag (J) as estimated positive data of the associated SDG samples for which field blank or PE sample was used for the spiked sample analysis.			
A.1.17.3	Circle on each Form VA all spike recoveries that are outside the control limits (75-125%) that have sample concentrations less than four times the added spike concentrations.			
	Are all recoveries within the control limits when sample concentrations are less than or equal to four times the spike concentrations? **NOTE:** Disregard the out of control spike recoveries for analytes whose concentrations are greater than or equal to four times the spike added.	[___]	✓	___
	Are results outside the control limits (75-125%) flagged with Lab Qualifier "N" on Form I's and Form VA?	[✓]	___	___
	ACTION: If no for any of the above, write in the Contract - Problems/Non-Compliance Section of the Data Review Narrative.			
A.1.17.4	**Aqueous**			
	Are any spike recoveries:			
	(a) less than 30%?	___	[✓]	___
	(b) between 30-74%?	✓	[___]	___
	(c) between 126-150%?	✓	[___]	___
	(d) greater than 150%?	✓	[___]	___
	ACTION: If the matrix spike recovery is less than 30%, reject (R) and red-line all associated aqueous data (detects & non-detects). If between 30-74%, qualify all associated aqueous data ≥ MDL as "J" and non-detects			

SD003-0211
Ca, Fe, Pb, Mn & Zn out low or high due to abundance - no quals required.

(80-120)

for analytes other than ~~Ca, Fe, Pb, Mn, Zn~~

X3 corrections JC
NO water spiked needed

401

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.: VWW06-SD003-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 52

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M	
Aluminum	80 - 120	15500000		8980000		5060000	128.9	N	P	J+
Antimony	80 - 120	33300		4910	U	50600	65.8	N	P	JTUJ
Barium	80 - 120	187000		25800		152000	106.1		P	
Beryllium	80 - 120	56500		3270	U	50600	111.7		P	
Cadmium	80 - 120	55200		1980	J	50600	105.2		P	
Calcium	-	115000000		114000000		5060000	19.8	N	P	NQ
Cobalt	80 - 120	60000		5140		50600	108.4		P	
Copper	80 - 120	212000		138000		50600	146.2	N	P	J+
Iron	-	38100000		26700000		5060000	225.3	N	P	NQ
Lead	-	529000		442000		50600	171.9	N	P	NQ
Magnesium	80 - 120	12600000		6430000		5060000	121.9	N	P	J+
Manganese	-	311000		294000		50600	33.6	N	P	NQ
Mercury	80 - 120	354		88.0		300	88.7		CV	
Nickel	80 - 120	67300		10200		50600	112.8		P	
Potassium	80 - 120	7380000		1760000		5060000	111.1		P	
Selenium	-								NR	
Silver	75 - 120	21600		3270	U	20200	106.9		P	
Sodium	80 - 120	20400000		12600000		5060000	154.2	N	P	J
Thallium	80 - 120	58600		6960	U	50600	115.8		P	
Vanadium	80 - 120	98200		38600		50600	117.8		P	
Zinc	-	595000		440000		50600	306.3	N	P	NQ

Comments:

180311 1925

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SD003-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 52

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M	
Aluminum	80 - 120	17100000		8980000		4830000	168.1	N	P	J+
Antimony	80 - 120	28400		4910	U	48300	58.8	N	P	J/UJ
Barium	80 - 120	176000		25800		145000	103.6		P	
Beryllium	80 - 120	51700		3270	U	48300	107		P	
Cadmium	80 - 120	51200		1980	J	48300	101.9		P	
Calcium	-	114000000		114000000		4830000	0	N	P	NQ
Cobalt	80 - 120	56700		5140		48300	106.7		P	
Copper	80 - 120	376000		138000		48300	492.8	N	P	J+
Iron	-	42800000		26700000		4830000	333.3	N	P	NQ
Lead	-	610000		442000		48300	347.8	N	P	NQ
Magnesium	80 - 120	13300000		6430000		4830000	142.2	N	P	J+
Manganese	-	356000		294000		48300	128.4	N	P	NQ
Mercury	80 - 120	408		88.0		296	108.1		CV	
Nickel	80 - 120	80000		10200		48300	144.5	N	P	NQ - MS OK
Potassium	80 - 120	7140000		1760000		4830000	111.4		P	
Selenium	-								NR	
Silver	75 - 120	19600		3270	U	19300	101.6		P	
Sodium	80 - 120	21600000		12600000		4830000	186.3	N	P	J
Thallium	80 - 120	52400		6960	U	48300	108.5		P	
Vanadium	80 - 120	101000		38600		48300	129.2	N	P	NQ - MS OK
Zinc	-	717000		440000		48300	573.5	N	P	NQ

Comments:

190311 1925

	YES	NO	N/A

as "UJ". If between 126-150%, flag (J) all data ≥ MDL as "J". If greater than 150%, reject (R) and red-line all associated data ≥ MDL.

(NOTE:Replace "N" with "J", "R" as appropriate.)

A.1.17.5 **Soil/Sediment**

Are any spike recoveries:

	YES	NO	N/A
(a) less than 10%?		[✓]	
(b) between 10-74%?	✓	[ ]	
(c) between 126-200%?	✓	[ ]	
(d) greater than 200%?	✓	[ ]	

J/UJ

J

ACTION:
If yes for any of the above, proceed as follows:

If the matrix spike recovery is less than 10%, reject (R) and red-line all associated data (detects & non-detects); if between 10-74%, qualify all associated data ≥ MDL as "J" and non-detects as "UJ"; if between 126-200%, flag (J) all associated data ≥ MDL as "J" If greater than 200%, reject (R) and red-line all associated data ≥ MDL.
(NOTE:Replace "N" with "J" or "R" as appropriate.)

no quals. beyond J for Cu - MS %R is < 200%

no quals for Ni or V - MSD is out high but MS is OK. Not flagged unless both spikes are out.

A.1.18 **Lab Duplicates) - Form VI**

A.1.18.1 Was the lab duplicate analysis performed:

	YES	NO	N/A
For each SDG?	[✓]		
On one of the SDG samples?	[✓]		
For each matrix type?	[✓]		
For each concentration range (low or med.)?	[✓]		
For each analytical Method (ICP-AES/ICP-MS, Hg, CN) Used?	[✓]		
Was a lab duplicate prepared and analyzed with the SDG samples?	[✓]		

404

		YES	NO	N/A
	ACTION: If no for any of the above, flag (J) as estimated all the SDG sample results (detects & non-detects) for which the lab duplicate analysis was not performed.			
	NOTE: If more than one lab duplicate sample were analyzed for an SDG, then qualify the associated samples based on the worst lab duplicate analysis.			
A.1.18.2	Was a Field Blank or PE sample used for the Lab Duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) all SDG sample results (hits & non-detects) for which Field Blank or PE sample was used for duplicate analysis.			
A.1.18.3	Circle on each Form VI all values that are: RPD > 20%, or Absolute Difference > CRQL			
	Are all values within control limits (RPD ≤ 20% or absolute difference ≤ ±CRQL)?	[___]	✓	___
	If no, are all results outside the control limits flagged with an "*" (Lab Qualifier) on Form VI and on all Form I's?	[✓]	___	___
	ACTION: If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.			
	NOTE: The laboratory is not required to report on Form VI the RPD when both values are non-detects.			
A.1.18.4	**Aqueous**			
A.1.18.4.1	When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			

	YES	NO	N/A
is any RPD > 20% but < 100%?	✓	[ ]	
is any RPD ≥ 100%?		[✓]	

X2 qac corr 4mm

ACTION:
If the RPD is > 20% but < 100%, flag (J) as estimated the associated sample data ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line the associated sample data ≥ CRQL.

(NOTE:Replace "*" with "J" or "R" as appropriate.)

A.1.18.4.2 When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate values:

> ± CRQL?		[ ]	✓
> ± 2xCRQL?		[ ]	✓

ACTION:
If the absolute difference is > CRQL, flag as estimated all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 2xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but < 5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.18.5 **Soil/Sediment** SD003-0211

A.1.18.5.1 When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%?	✓	[ ]	
is any RPD ≥ 120%?		[✓]	

ACTION:
If the RPD is ≥ 35% and < 120%, flag (J) as estimated the associated sample

Cu - 55.8% J/UJ

U.S. EPA - CLP

6

DUPLICATES

EPA Sample No.

VWW06-SD003-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501993

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 52 % Solids for Duplicate: 52

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum	20	15500000		17100000		9.8		P
Antimony	20	33300		28400		15.9		P
Barium	20	187000		176000		6.1		P
Beryllium	20	56500		51700		8.9		P
Cadmium	20	55200		51200		7.5		P
Calcium	20	115000000		114000000		0.9		P
Cobalt	20	60000		56700		5.7		P
Copper	20	212000		376000		55.8	*	P
Iron	20	38100000		42800000		11.6		P
Lead	20	529000		610000		14.2		P
Magnesium	20	12600000		13300000		5.4		P
Manganese	20	311000		356000		13.5		P
Mercury	30	354		408		14.2		CV
Nickel	20	67300		80000		17.2		P
Potassium	20	7380000		7140000		3.3		P
Silver	20	21600		19600		9.7		P
Sodium	20	20400000		21600000		5.7		P
Thallium	20	58600		52400		11.2		P
Vanadium	20	98200		101000		2.8		P
Zinc	20	595000		717000		18.6		P

J7UJ

Comments:

180311 1925

		YES	NO	N/A
	data ≥ CRQL. If the RPD is ≥ 120%, reject (R) and red-line the associated sample data ≥ CRQL.			
A.1.18.5.2	When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and duplicate:			
	> ± 2 x CRQL?	___	[___]	___ ✓
	> ± 4 x CRQL	___	[___]	___ ✓

ACTION:
If the absolute difference is > 2 x CRQL, flag all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 4xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but <5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.19 Field Duplicates

Aqueous Field Duplicates

		YES	NO	N/A
A.1.19.1	Was an aqueous Field Duplicate pair collected and analyzed? (Check Sampling Trip Report)	[___]	___	___ ✓

ACTION:
If yes, prepare a Form (Appendix A.4) for each aqueous Field Duplicate pair. Report the sample and Field Duplicate results on Appendix A.4 from their respective Form I's. Calculate and report RPD on Appendix A.4 when sample and its Field Duplicate values are both > 5xCRQL. Calculate and report the absolute difference on Appendix A.4 when at least one value (sample or duplicate) is <5xCRQL. Evaluate the aqueous Field Duplicate analysis in accordance with the

		YES	NO	N/A

QC criteria stated in Sections A.1.19.2 and A.1.19.3.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this the criteria to qualify the results.

A.1.19.2 Circle all values on the Form (Appendix A.4) for Field Duplicates that have:

RPD ≥ 20% or

Difference > ± CRQL

When sample and duplicate values are both ≥5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 20%?	___	[___]	___ ✓
is any RPD ≥ 100%?	___	[___]	___ ✓

ACTION:
If the RPD is >20% but < 100%, flag (J) only the associated sample and its Field Duplicate results ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line only the associated sample and its Field Duplicate result ≥ CRQL.

A.1.19.3 When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate:

> ± CRQL?	___	[___]	___ ✓
> ± 2 x CRQL?	___	[___]	___ ✓

ACTION:
If the absolute difference is > CRQL, flag detects ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the difference is > 2xCRQL, reject (R) and red-line non-detects

		YES	NO	N/A
	and results ≥ MDL but <5xCRQL of the sample and its Field Duplicate.			
	Soil/Sediment Field Duplicates			
A.1.19.4	Was a soil field duplicate pair collected and analyzed? (Check Sampling Trip Report)	[✓]	___	___
	ACTION: If yes, for each soil Field Duplicate pair proceed as follows:			
	Prepare Appendix A.4 for each Field Duplicate pair. Report on Appendix A.4 all sample and its Field Duplicate results in MG/KG from their respective Form I's. Calculate and report RPD when sample and its duplicate values are both greater than 5xCRQL. Calculate and report the absolute difference when at least one value (sample or duplicate) is < 5xCRQL. Evaluate the Field Duplicate analysis in accordance with the QC Criteria stated in Sections A.1.19.5 and A.1.19.6.			
	NOTE: 1. Do not transfer "*" from Form I's to Appendix A.4. 2. Do not calculate RPD when both values are non-detects. 3. Substitute MDL for CRQL when MDL > CRQL. 4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and apply the criteria to qualify the results.			
A.1.19.5	Circle on each Appendix A.4 all values that have: RPD ≥ 35%, or Difference > ± 2xCRQL When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			
	is any RPD ≥ 35% but < 120%?	___	[___]	___
	is any RPD ≥ 120%?	___	[___]	___
	ACTION: If the RPD is ≥ 35% but < 120%,			

SD0006-0211
SD0006P-0211
SD0011-0211
SD0011P-0211

used lab QC limits
30% - soils

DataQual **Metals**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD0006-0211
Duplicate Sample ID: VWW06-SD0006P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD	
aluminum	8980000	7820000	14	
barium	25800	15100	52	J
cadmium	1980	1750	230	
calcium	114000000	94400000	19	
cobalt	5140	4130	22	
copper	138000	73400	61	J
iron	26700000	18800000	35	J
lead	44200	18500	82	J
magnesium	6430000	5390000	18	
manganese	294000	245000	18	
mercury	88	64.2	31	J
nickel	10200	6410	46	J
potassium	1760000	1700000	3	
sodium	12600000	12600000	0	
vanadium	38600	32600	17	
zinc	440000	262000	51	J
arsenic	4	4.8	18	
chromium	14.3	14.2	1	
			#DIV/0!	

COMMENTS: 30% RPD limit for all analytes >5X LOD; +/- 2X LOD if <5X LOD - J flag (per SAP)
120% RPD limit or +/- 4X LOD limit for R flag.

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD0011-0211
Duplicate Sample ID: VWW06-SD0011P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
aluminum	5400000	5610000	4
barium	49800	48600	2
cadmium	500	918	-418
calcium	107000000	99200000	8
cobalt	3400	4050	17
copper	57600	72000	22
iron	11200000	11900000	6
lead	12100	12700	5
magnesium	5280000	5380000	2
manganese	229000	247000	8
mercury	8.97	10.6	-1.63
nickel	3030	3560	-530
potassium	847000	874000	3
sodium	5390000	5020000	7
vanadium	32700	35000	7
zinc	56900	58000	2

COMMENTS: 30% RPD limit for all analytes >5X LOD; +/- 2X LOD if <5X LOD - J flag
120% RPD limit or +/- 4X LOD limit for R flag.

		YES	NO	N/A
	flag only the associated sample and its Field Duplicate results ≥ CRQL as "J". If the RPD is ≥ 120%, reject (R) and red-line only the sample and its Field Duplicate results ≥ CRQL.			
A.1.19.6	When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and Field Duplicate:			
	> ± 2 x CRQL?	___	[✓]	___
	> ± 4 x CRQL?	___	[✓]	___
	ACTION: If the absolute difference is > 2xCRQL, flag Sample and its Field Duplicate resuts ≥ MDL but <5xCRQL as "J" and non-detects as "UJ". If the difference is >4xCRQL, reject(R) and red-line non-detects and detects ≥ MDL but <5xCRQL of the sample and its Field Duplicate.			
A.1.20	**Laboratory Control Sample (LCS)- Form VII**			
A.1.20.1	Was one LCS prepared and analyzed for:			
	Each SDG?	[✓]	___	___
	Each matrix type?	[✓]	___	___
	Each batch samples digested/distilled?	[✓]	___	___
	For each Method(ICP-AES,ICP-MS,Hg,CN) used?	[✓]	___	___
	Was an LCS prepared and analyzed with the samples?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log and contact CLP PO or TOPO for submittal of the LCS results. Flag (J) as estimated all the data for which an LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for			

	YES	NO	N/A

more than 20 samples, then the first 20 samples analyzed are not flagged(J), but all additional samples must be qualified (J).

A.1.20.2 Aqueous LCS

Circle on each Form VII the LCS percent recoveries outside control limits 80-120%.

NOTE: 1.Use digested ICV as LCS for aqueous mercury
2.Use distilled ICV as LCS for aqueous cyanide

Is any LCS recovery:

Less than 50%?	___	[✓]	___
Between 50% and 79%?	___	[✓]	___
Between 121% and 150%?	___	[✓]	___
Greater than 150%?	___	[✓]	___

ACTION:
If the LCS recovery is less than 50%, reject (R) and red-line all associated sample data (detects & non-detects); for a recovery between 50-79%, flag detects as "J" all non-detects as "UJ". if the LCS recovery is between 121-150%, flag only detects as "J". if the recovery is greater than 150%, reject (R) and red-line all detects.

A.1.20.3 Solid LCS

If an analyte's MDL is equal to or greater than the true value of LCS, disregard the "Action" below for that analyte even though the LCS is out of control limits.

Is the LCS "Found" value greater than the Upper Control Limit reported on Form VII?	___	[✓]	___

ACTION:

		YES	NO	N/A	
	If yes, flag (J) all the associated detects ≥ MDL as estimated (J).				
	Is the LCS "Found" value lower than the Lower Control Limit reported on Form VII?	___	[✓]	___	
	ACTION: If yes, flag detects as "J" and non-dectes as "UJ".				
A.1.21	**ICP-AES/ICP-MS Serial Dilution - Form VIII** **NOTE:** Serial dilution analysis is required only when the initial concentration is equal to or greater than 50 x MDL.				
A.1.21.1	Was a Serial Dilution analysis performed:				
	For each SDG?	[✓]	___	___	
	On one of the SDG samples?	[✓]	___	___	For soils H20 SD is from SOW 997
	For each matrix type?	[✓]	___	___	
	For each concentration range (low or med.)?	[✓]	___	___	
	Was a Serial Dilution sample analyzed with the SDG samples?	[✓]	___	___	
	ACTION: If no for any of the above, flag as estimated (J) detects ≥ MDL of all the SDG samples for which the ICP Serial Dilution Analysis was not performed.				
A.1.21.2	Was a Field Blank or PE sample used for the Serial Dilution Analysis?	___	[✓]	___	
	ACTION: If yes, flag as estimated (J) detects ≥ MDL of all the SDG samples				
A.1.21.3	Circle on Form VIII the Percent Differences (%D) between sample results and its dilution results that are outside the control limits ± 10%				

U.S. EPA - CLP

9

SERIAL DILUTIONS

SD003-0211

EPA Sample No.

350199301L

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: Soil Level:(low/med) LOW

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M
Aluminum	87773.96		79800.00		9.1		P
Antimony		U		U			P
Barium	252.35		237.00	J	6.1		P
Beryllium		U		U			P
Cadmium	19.40	J		U			P
Calcium	1113613.69		1030000.00		7.5		P
Cobalt	50.30		48.70	J	3.2		P
Copper	1352.53		1260.00		6.8		P
Iron	261104.11		245000.00		6.2		P
Lead	4319.14		4130.00		4.4		P
Magnesium	62882.36		58300.00		7.3		P
Manganese	2877.86		2600.00		9.6		P
Mercury	0.76			U			CV
Nickel	99.48		52.10	J	48	E	P
Potassium	17264.08		15900.00	J	7.9		P
Silver		U		U			P
Sodium	123050.13		112000.00		9.0		P
Thallium		U		U			P
Vanadium	377.61		349.00	J	7.6		P
Zinc	4296.97		4100.00		4.6		P

J/UJ

Flag all soils

Comments:

180311 1925

U.S. EPA - CLP

9

SERIAL DILUTIONS

SW0116-0211

EPA Sample No.

350199703L

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501993

Matrix: Water Level:(low/med) LOW

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M
Aluminum	3080.78	J	5600.00	J	82	E	P
Barium	42.09	J	71.20	J	69	E	P
Beryllium	10.19	J	37.40	J	270	E	P
Calcium	660505.52		641000.00		3.0		P
Iron	775.50	J	1470.00	J	90	E	P
Magnesium	1464756.84		643000.00		56	E	P
Manganese	-53.11	U	175.00	U			P
Mercury	0.04	U	0.37	U			CV
Nickel	-33.36	U	465.00	U			P
Potassium	622774.07		612000.00		1.7		P
Selenium	69.00	U	2050.00	U			P
Sodium	16721605.89		17300000.00		3.4		P
Thallium	165.03	U	2200.00	U			P
Vanadium	7.08	U	220.00	U			P
Zinc	-16.71	U	2000.00	U			P

NQ

No impact - only H2O Sample in this SDG is rinse blank

Comments:

180311 1925

		YES	NO	N/A
	when initial concentrations ≥ 50 x MDLs.			
	Are results outside the control limits flagged with an "E"(Lab Qualifier) on Form VIII and all Form I's?	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/ Non-Compliance Section of the Data Review Narrative.			
A.1.21.4	Are any %D values:			
	> 10%?	✓	[___]	___
	≥ 100%?	___	[✓]	___
	ACTION: If the Percent Difference (%D) is greater than 10%, flag (J) as estimated all associated samples whose raw data ≥ MDL; if the %D is ≥ 100%, reject (R) and red-line all associated samples with raw data ≥ MDL.			
	(NOTE:Replace "E" with "J" or "R" as appropriate.)			
A.1.22	**Total/Dissolved or Inorganic/Total Analytes**			
A.1.22.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s)?	___	[___]	✓
	Were any analyses performed for inorganic as well as total analytes on the same sample(s)?	___	[___]	✓
	ACTION: If yes, prepare a Form (Appendix A.5) to compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference on Appendix A.5 as a percent of the total analyte only when both of the following conditions are fulfilled:			
	(1) The dissolved(or inorganic)concentration is greater than total concentration, and (2) greater than or equal to 5xMDL.			
A.1.22.2	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%?	___	[___]	✓

		YES	NO	N/A
A.1.22.3	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 50%?	___	[___]	✓

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) and red-line both the values.

A.1.23 **Field Blank - Form I**
NOTE: Designate "Field Blank" as such on Form I

A.1.23.1	Was a Field/Rinsate Bank collected and analyzed with the SDG samples?	[✓]	___	___
	If yes, is any Field/Rinsate Blank absolute value of an analyte on Form I greater than its CRQL (or 2xMDL when MDL>CRQL)?	___	[✓]	___
	If yes, circle the Field Blank value on Form I that is greater than the CRQL, (or 2 x MDL when MDL > CRQL).			
	Is any Field Blank value greater than CRQL also greater than the Preparation Blank value?	___	[✓]	___
	If yes, is the Field Blank value (> CRQL and > the prep. blank value) already rejected due to other QC criteria?	[___]	___	✓

ACTION:
If the Field Blank value was not rejected, reject all associated sample data (except the Field Blank results) greater than the CRQL but less than the Field Blank value. Reject on Form I's the soil sample results whose raw values in ug/L in the instrument printout are greater than the CRQL but less than the Field Blank value in ug/L. Flag as "J" detects between the Field Blank value and 10xField Blank value. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

* RB - VWW06-EB01-020411 no impact in samples associated.

If the Field Blank value is less than the

		YES	NO	N/A
	Prep.Blank value, do not qualify the sample results due to the Field Blank criteria.			

NOTE:
1. Field Blank result previously rejected due to other criteria cannot be used to qualify field samples.
2. Do not use Rinsate Blank associated with soils to qualify water samples and vice versa.

A.1.24 **Verification of Instrumental Parameters - Form IX, XA, XB, XI**

A.1.24.1	Is verification report present for:			
	Method Detection Limits (Form IX-Annually)?	[✓]	___	___
	ICP-AES Interelement Correction Factors (Form XA & XB -Quarterly)?	[✓]	___	___
	ICP-AES & ICP-MS Linear Ranges (Form XI-Quarterly)?	[✓]	___	___

ACTION:
If no, contact CLP PO/TOPO for submittal from the laboratory.

A.1.24.2 **Method Detection Limits - Form IX**

A.1.24.2.1	Are MDLs present on Form IX for:			
	All the analytes?	[✓]	___	___
	All the instruments used?	[✓]	___	___
	Digested and undigested samples ~~and Calib.Blanks?~~ on Form I's QC 41211	[✓]	___	___
	ICP-AES and ICP-MS when both instruments are used for the same analyte?	[✓]	___	___

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO/TOPO for submittal of the MDLs from the laboratory. Report to CLP PO and write in the Contract Problems/ Non-Compliance Section of the Data Review Narrative if the MDL concentration is not less than ½ CRQL.

		YES	NO	N/A
A.1.24.2.2	Is MDL greater than the CRQL for any analyte?	___	[✓]	___
	If yes, is the analyte concentration on Form I greater than 5 x MDL for the sample analyzed on the instrument whose MDL exceeds CRQL?	[___]	___	✓
	ACTION: If no, flag as estimated (J) all values less than five times MDL for the analyte whose MDL exceeds the CRQL.			
A.1.24.3	**Linear Ranges - Form XI**			
A.1.24.3.1	Was any sample result higher than the high linear range for ICP-AES or ICP-MS?	___	[✓]	___
	Was any sample result higher than the highest calibration standard for mercury or cyanide?	___	[✓]	___
	If yes for any of the above, was the sample diluted to obtain the result reported on Form I?	[___]	___	✓
	ACTION: If no, flag (J) as estimated the affected detects (≥ MDL) reported on Form I.			
A.1.25	**ICP-MS Tune Analysis - Form XIV**			
A.1.25.1	Was the ICP-MS instrument tuned prior to calibration?	[✓]	___	___
	ACTION: If no, reject (R) and red-line all sample data for which tuning was not performed.			
A.1.25.2	Was the tuning solution analyzed or scanned at least five times consecutively?	[✓]	___	___
	Were all the required isotopes spanning the analytical range present in the tuning solution?	[✓]	___	___
	Was the mass resolution within			

		YES	NO	N/A
	0.1 amu for each isotope in the tuning solution?	[✓]		
	Was %RSD less than 5% for each isotope of each analyte in the tuning solution?	[✓]		
	ACTION: If no for any of the above, qualify all results ≥ MDL associated with that Tune as estimated "J", and all non-detects associated with that Tune as "UJ".			
A.1.26	**ICP-MS Internal Standards - Form XV**			
A.1.26.1	Were the Internal Standards added to all the samples and all QC samples and calibration standards (except the Tuning Solution)?	[✓]		
	Were all the target analyte masses bracketed by the masses of the five internal standards?	[✓]		
	ACTION: If none of the Internal Standards was added to the samples, reject (R) and red-line all the associated sample data (detects & non-detects). If internal standards were used but did not cover all the analyte masses, reject (R) and red-line only the analyte results not bracketed by the internal standard masses.			
A.1.26.2	Was the intensity of an Internal Standard in each sample within 60-125% of the intensity of the same Internal Standard in the calibration blank?	[✓]		
	If no, was the original sample diluted two fold, Internal Standard added and the sample re-analyzed?	[ ]		✓
	Was the %RI for the two fold diluted sample within the acceptance limits (60-125%)?	[ ]		✓
	ACTION: If no for any of the above, flag detects as "J" and non-detects "UJ" of all the analytes with atomic masses between the			
	atomic mass of the internal standard lighter			

than the affected internal standard, and the atomic mass of the internal standard heavier than the affected internal standard.

A.1.27 Percent Solids of Sediments

A.1.27.1 Are percent solids in sediment(s):

< 50%? ✓ [___] ___

VWW06-SD009-0211 32.1%
JTUJ

ACTION:
If yes, qualify as estimated (J) all detects and non-detects of a sample that has percent solids less than 50%(i.e.,moisture content greater than 50%).

NOTE:
Flag(J) only the sample results that were not previously flagged due to other QC criteria.

Inorganic Data Review Narrative

Case# _____ Site: _____ Matrix: Soil ____

SDG# _____ Lab: _____ Water ____

Sampling Team: _____ Reviewer: _____ Other _____

A.2.1 Data Validation Flags:
The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as estimated

R and Red-Line - A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results ≥ MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully usable.

A.2.2 Laboratory Qualifiers:
The CLP laboratory applies a contractual qualifier on all

DataQual ***Worksheets –Hexavalent Chromium***

This SDG contains hexavalent chromium analysis using SW-846 7196A. Resubmissions were not required.

Laboratory: PEL

HOLDING TIMES

Sampling Date: 2/4/11
Received Date: 2/7/11
Analysis Dates: 2/7-8/11
Cooler temps: 9.9-10.5°C (soils); 1.1 °C (waters)

All holding time requirements were met with the exception of sample VWW06-EB01-020411which was analyzed two days out of holding time; therefore the positive result was qualified as estimated (J). All soils samples except samples SD003 and SD004 were qualified as estimated (J/UJ) due to exceeded cooler temperatures, as the method and SAP requires samples to be stored at 4°C until analysis. Sample SD009 exhibited high % moisture with 67.9%; therefore was qualified as estimated (J/UJ).

CALIBRATIONS

All initial calibration criteria were met. Calibration verification criteria were met for all ICV and CCV standards. No qualifications were required.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- Apply the same data validation guidelines to any associated calibration, preparation, and field QC blanks and all associated samples.
- Qualification/Action codes:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U at LOD	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD
R or J_+	The blank contaminant concentration was greater than the LOD and the sample result is greater than the LOD but less than 10X the blank contaminant concentration. The reported results are flagged either as rejected R or biased high J+ based on the professional judgment of the validator.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	RL (LOD)
VWW06-EB01-020411	hexavalent chromium	0.008J mg/L	0.007

Sample ID	Analyte	Q Flag	Q Code
no qualifications required			

The concentration noted for the CCBs is the highest concentration in all the CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for noted CCB contamination. See worksheets for associations. Samples are qualified for field QC blank contamination based on QC tracking provided by CH2M HILL. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment.

LCS

All LCS recoveries and RPDs were acceptable.

MATRIX SPIKE/DUPLICATE SUMMARY

The MS / MSD pair analyzed for sample VWW06-SD003-0211exhibited acceptable recoveries and RPD.

FIELD DUPLICATE SAMPLE SUMMARY

Note: Field duplicate results are assessed only if both results are above the CRDL.

Sample ID: **VWW06-SD006-0211** **Duplicate Sample ID:** **VWW06-SD006P-0211**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium	988	2990	101%
			#DIV/0!
			#DIV/0!

Comments: Qualify results as estimated (J).

Sample ID: **VWW06-SD011-0211** **Duplicate Sample ID:** **VWW06-SD011P-0211**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium	1740	2380	31%
			#DIV/0!
			#DIV/0!

Comments: No qualifications required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Detection limits were acceptable. Raw data was verified.

Reviewer _____ **Date:** 4/11/11

CH2M HILL
SWMU 6 CTO-111
SDG# 3501993

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: The following samples were analyzed out of hold: VWAE-EB01-020411. The sample was received out of hold. The sample was analyzed as close to the hold time as possible.

III. METHODS

Analyses were performed according to PEL Laboratory's Standard Operating Procedures and EPA Method 7196A.

IV. PREPARATION

There is no preparation step for this test.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501993

Client: CH2M Hill

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/10/2011

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

April 19, 2011
SDG# 3501997, PEL; K0205/K0205D Mitkem
East Vieques Island, Puerto Rico

Dear Ms. Weber,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 3501997. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, 8081B-Rev. 1.0, October 2006-SOP HW-44, 8082A- Rev 1, October 2006- SOP# HW-45, and ILM05.3-Rev. 13, September 2006-SOP #HW-2) and professional judgment. The SOP for the inorganic parameters (metals) is used but is modified as necessary to reflect the QC requirements of the method and the site SAP. Region II has not developed a validation checklist SOP for the method used to assess hexavalent chromium in this SDG (SW-846 method 7196A). Alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	V	SV	Pest	PCB	TM 6010	DM 6010	TM 6020	DM 6020	T Hg	D Hg	T HCr	D HCr
VWW06-TB01-020711	350199707	water	X											
VWW06-EB01-020711	350199708	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW001-0211	350199709	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW002-0211	350199710	water	X	X	X	X	X	X	X	X	X	X	X	X
VWW06-SW014-0211	350199701	water			X		X	X	X	X	X	X	X	X
VWW06-SW015-0211	350199702	water			X		X	X	X	X	X	X	X	X
VWW06-SW016-0211	350199703	water			X		X	X	X	X	X	X	X	X
VWW06-SW017-0211	350199706	water			X		X	X	X	X	X	X	X	X
VWW06-EB02-020711	350199711	water			X		X		X		X		X	
VWW06-SW016-0211 MS	350199703MS	water			X		X	X	X	X	X	X	X	X
VWW06-SW016-0211 MSD	350199703MSD	water			X		X	X	X	X	X	X	X	X

*Please note – the ID in the Lab ID column is the PEL Lab ID.

TM – total metals DM – dissolved metals
THg – total mercury DHg – dissolved mercury

The following quality control samples were provided with this SDG: samples VWW06-EB01-020711 and VWW06-EB02-020711- equipment blanks; and sample VWW06-TB01-020711- trip blank

The samples were evaluated based on the following criteria:

• Data Completeness	*
• Sample Condition	*
• Technical Holding Times	
• GC/MS Tuning	*
• GC Performance	*
• ICP MS Tuning	*
• Initial/Continuing Calibrations	*
• ICSA/ICSAB Standards	*
• LLQ Standards	*
• Blanks	
• Internal Standards	*
• Surrogate Recoveries	*
• Laboratory Control Samples	*
• Matrix Spike Recoveries	
• Matrix Duplicate RPDs	*
• Serial Dilutions	
• Field Duplicates	NA
• Identification/Quantitation	*
• Reporting Limits	*
• Tentatively Identified Compounds	NA

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. Please note that when a compound or analyte is flagged due to blank contamination the BL qualifier code takes precedence over all other qualifier codes except a code that explains rejected data.

Please note: the validator has added a T or a D to the metals IDs to indicate total or dissolved as necessary.

VOA

Due to blank contamination, qualifications were added to the data.

SVOA

No qualifications to the data were required.

Pesticides

No qualifications to the data were required.

PCBs

No qualifications to the data were required.

Total & Dissolved Metals

Blank contamination was noted and qualification was required in the samples in this SDG.

The submitted MS/MSD pair exhibited some recoveries that were non-compliant. Qualifications to the data were required. Please note that not all recoveries were used to assess the field samples because of the high dilutions required due to internal standard area recovery issues.

The serial dilution analysis exhibited one non-compliant %D. Results were qualified as estimated for the non-compliant analyte.

Hexavalent Chromium

Several water sample analyses exceeded the required 24-hour holding time; therefore results were qualified as estimated.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the metals data package as the wrong raw data was present. The laboratory was contacted and the correct 6010B raw data package was provided. The low level quantitation standard summary data was not present in the data packages. Both PEL and Mitkem were notified and they submitted responses to the request. Copies of the e-mail correspondence are included in the worksheets portion of this data validation report.

Technical Holding Times

According to chain of custody records, sampling was performed on 2/7/11 and samples were received at PEL on 2/8/11 and at Mitkem on 2/9/11. All sample preparation and

analysis was performed within Region II and/or method holding time requirements with the following exceptions.

Hexavalent Chromium

All total and dissolved water samples, with the exception of total samples VWW06-SW014-0211, VWW06-EB02-020711 and VWW06-SW001-0211, exceeded the required 24 hour holding time by 1-5 hours; therefore results were qualified as estimated (J/UJ), qualifier code: HT.

Blanks

VOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table.

Blank ID	Compound	Concentration	Reporting Limit (LOD)
021411BLK32	acetone	3.7 ug/L	2.6 ug/L

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Q Code
VWW06-SW001-0211, VWW06-SW002-0211	acetone	U at LOD	MBL

Total & Dissolved Metals

Associated blanks exhibited contamination as noted in the following table.

Blank ID	Analyte	Concentration	Action Level
ICB -- 6010B Total	aluminum	11.6J ug/L	LOD
	beryllium	0.25J ug/L	
	iron	23.5J ug/L	
ICB #1 – 6010B Dissolved	aluminum	21.3J ug/L	
	thallium	4.68J ug/L	
ICB #2 – 6010B Dissolved	aluminum	12.7J ug/L	
CCB8 – Run 1 6010B Dissolved	vanadium	0.526J ug/L	
CCB5 – Run 2 6010B Dissolved	thallium	5.06J ug/L	
ICB - 6020 Total & Dissolved	arsenic	0.260J ug/L	
	cobalt	0.059J ug/L	
CCB10 – 6020 Total & Dissolved	lead	0.090J ug/L	
VWW06-EB01-020711 Total	chromium	0.37J ug/L	
VWW06-EB01-020711 Dissolved	chromium	0.34J ug/L	

Please note, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag	Q Code
VWW06-SW014-0211 T, VWW06-SW015-0211 T, VWW06-SW014-0211 D, VWW06-SW015-0211 D, VWW06-SW002-0211 D	aluminum	U at LOD	MBL
VWW06-SW016-0211 T	beryllium	U at LOD	MBL
VWW06-SW017-0211 T	iron	U at LOD	MBL
VWW06-SW015-0211 D, VWW06-SW001-0211 D	thallium	U at LOD	MBL
VWW06-SW016-0211 D	vanadium	U at LOD	MBL
VWW06-SW014-0211 T, VWW06-SW017-0211 T, VWW06-SW014-0211 D, VWW06-SW016-0211 D	arsenic	U at LOD	MBL
VWW06-SW002-0211-T, VWW06-SW002-0211 D	cobalt	U at LOD	MBL
VWW06-SW002-0211 T, VWW06-SW002-0211 D	lead	U at LOD	MBL
VWW06-SW016-0211 T, VWW06-SW017-0211T, VWW06-SW002-0211 D, VWW06-SW014-0211 D, VWW06-SW015-0211 D, VWW06-SW017-0211 D	chromium	U at LOD	EBL

Matrix Spike Recoveries

Total & Dissolved Metals

The matrix spike pair submitted in this SDG exhibited non-compliant %R's, requiring qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table. Please note that the results for the ICP-AES sodium spike and for the ICP-MS spikes were not used to qualify the samples because of the high dilutions required. The mercury post-digestion spike also exhibited a low recovery (58.3) confirming a possible matrix issue. Post-digestion spikes were not performed for the ICP-MS fraction.

MS	Analytes	Samples	%R	Q Flag	Q Code
VWW06-SW016-0211 T	mercury	all total field samples	60/57.7	J/UJ	MSL
VWW06-SW016-0211 D	magnesium	all dissolved field samples	60/40	J/UJ	MSL
	mercury		57.4/57.4		
	selenium		130.4/124	J	MSH

Serial Dilutions

Total & Dissolved Metals

The serial dilutions submitted in this SDG exhibited non-compliant %Ds, requiring qualification in the field samples. A summary of this non-compliance and affected samples are noted in the following table. Qualifications were made per Region II guidelines.

SD	Analytes	Samples	%D	Q Flag	Q Code
VWW06-SW016-0211 T	barium	all total water field samples	14	J/UJ	SD
VWW06-SW016-0211 D	barium	all dissolved water field samples	14	J/UJ	SD

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff
President

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SW001-0211, VWW06-SW002-0211	acetone	+	U at LOD	MBL

SVOA

Sample ID	Compound	Results	Q flag	Q Code
No qualifications required				

Pesticides

Sample ID	Compound	Results	Q flag	Q Code
No qualifications required				

PCBs

Sample ID	Compound	Results	Q flag	Q Code
No qualifications required				

Total and Dissolved Metals

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SW014-0211 T, VWW06-SW015-0211 T, VWW06-SW014-0211 D, VWW06-SW015-0211 D, VWW06-SW002-0211 D	aluminum	+J	U at LOD	MBL
VWW06-SW016-0211 T	beryllium	+J	U at LOD	MBL
VWW06-SW017-0211 T	iron	+J	U at LOD	MBL
VWW06-SW015-0211 D, VWW06-SW001-0211 D	thallium	+J	U at LOD	MBL
VWW06-SW016-0211 D	vanadium	+J	U at LOD	MBL
VWW06-SW014-0211 T, VWW06-SW017-0211 T, VWW06-SW014-0211 D, VWW06-SW016-0211 D	arsenic	+J	U at LOD	MBL
VWW06-SW002-0211-T, VWW06-SW002-0211 D	cobalt	+J	U at LOD	MBL
VWW06-SW002-0211 T, VWW06-SW002-0211 D	lead	+J	U at LOD	MBL
VWW06-SW016-0211 T, VWW06-SW017-0211T, VWW06-SW002-0211 D, VWW06-SW014-0211 D, VWW06-SW015-0211 D, VWW06-SW017-0211 D	chromium	+J	U at LOD	EBL
all total field samples	mercury	+/-	J/UJ	MSL
all dissolved field samples	magnesium mercury	+/-	J/UJ	MSL
all dissolved field samples	selenium	+	J	MSH
all total field samples	barium	+/-	J/UJ	SD
all dissolved field samples	barium	+/-	JUJ	SD

CH2M HILL
SWMU 6- Vieques, Puerto Rico
SDG# 3501997/K0205/K0205D

Summary of Data Qualifications

Hexavalent Chromium

Sample ID	Compound	Results	Q flag	Q Code
All total and dissolved water samples, with the exception of total samples VWW06-SW014-0211, VWW06-EB02-020711 and VWW06-SW001-0211	hexavalent chromium	+/-	J/UJ	HT

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the FB result is less or greater than the RL.
R -	Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.
J -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

General Abbreviations

RL/LOD	reporting limit
PQL	practical quantitation limit
IDL	instrument detection limit
MDL	method detection limit
CRQL/LOQ	contract required quantitation limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-020711

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199707 Lab File ID: 99707.D

Sample wt/vol: 5 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1339

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	0.78	J	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-020711

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199707 Lab File ID: 99707.D

Sample wt/vol: 5 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1339

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708 Lab File ID: 99708.D

Sample wt/vol: 5 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1402

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	0.76	J	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code: PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708 Lab File ID: 99708.D

Sample wt/vol: 5 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1402

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709 Lab File ID: 99709.D

Sample wt/vol: 5 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1426

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	~~2.1~~ 2.6	J U	1.3 ; MBL	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709 Lab File ID: 99709.D

Sample wt/vol: 5 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1426

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710 Lab File ID: 99710.D

Sample wt/vol: 5 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1449

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	~~2~~ 2.6	~~U~~ J	1.3 MBL	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710 Lab File ID: 99710.D

Sample wt/vol: 5 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1449

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708 Lab File ID: 99708.D

Sample wt/vol: 960 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 1 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1516

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
90-12-0	1-Methylnaphthalene	0.042	U	0.021	0.042	0.052
91-57-6	2-Methylnaphthalene	0.042	U	0.021	0.042	0.052
83-32-9	Acenaphthene	0.042	U	0.021	0.042	0.052
208-96-8	Acenaphthylene	0.042	U	0.021	0.042	0.052
120-12-7	Anthracene	0.042	U	0.021	0.042	0.052
56-55-3	Benzo(a)anthracene	0.042	U	0.021	0.042	0.052
50-32-8	Benzo(a)pyrene	0.042	U	0.021	0.042	0.052
205-99-2	Benzo(b)fluoranthene	0.042	U	0.021	0.042	0.052
191-24-2	Benzo(g,h,i)perylene	0.042	U	0.021	0.042	0.052
207-08-9	Benzo(k)fluoranthene	0.042	U	0.021	0.042	0.052
218-01-9	Chrysene	0.042	U	0.021	0.042	0.052
53-70-3	Dibenzo(a,h)anthracene	0.042	U	0.021	0.042	0.052
206-44-0	Fluoranthene	0.042	U	0.021	0.042	0.052
86-73-7	Fluorene	0.042	U	0.021	0.042	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	U	0.021	0.042	0.052
91-20-3	Naphthalene	0.042	U	0.021	0.042	0.052
85-01-8	Phenanthrene	0.042	U	0.021	0.042	0.052
129-00-0	Pyrene	0.042	U	0.021	0.042	0.052

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709 Lab File ID: 99709.D

Sample wt/vol: 960 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 1 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1546

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
90-12-0	1-Methylnaphthalene	0.042	U	0.021	0.042	0.052
91-57-6	2-Methylnaphthalene	0.042	U	0.021	0.042	0.052
83-32-9	Acenaphthene	0.042	U	0.021	0.042	0.052
208-96-8	Acenaphthylene	0.042	U	0.021	0.042	0.052
120-12-7	Anthracene	0.042	U	0.021	0.042	0.052
56-55-3	Benzo(a)anthracene	0.042	U	0.021	0.042	0.052
50-32-8	Benzo(a)pyrene	0.042	U	0.021	0.042	0.052
205-99-2	Benzo(b)fluoranthene	0.042	U	0.021	0.042	0.052
191-24-2	Benzo(g,h,i)perylene	0.042	U	0.021	0.042	0.052
207-08-9	Benzo(k)fluoranthene	0.042	U	0.021	0.042	0.052
218-01-9	Chrysene	0.042	U	0.021	0.042	0.052
53-70-3	Dibenzo(a,h)anthracene	0.042	U	0.021	0.042	0.052
206-44-0	Fluoranthene	0.042	U	0.021	0.042	0.052
86-73-7	Fluorene	0.042	U	0.021	0.042	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	U	0.021	0.042	0.052
91-20-3	Naphthalene	0.042	U	0.021	0.042	0.052
85-01-8	Phenanthrene	0.042	U	0.021	0.042	0.052
129-00-0	Pyrene	0.042	U	0.021	0.042	0.052

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710 Lab File ID: 99710.D

Sample wt/vol: 960 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 1 Date Extracted: 02/08/11

Level:(low/med) LOW Date Analyzed: 02/09/11 Time: 1616

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
90-12-0	1-Methylnaphthalene	0.042	U	0.021	0.042	0.052
91-57-6	2-Methylnaphthalene	0.023	J	0.021	0.042	0.052
83-32-9	Acenaphthene	0.042	U	0.021	0.042	0.052
208-96-8	Acenaphthylene	0.042	U	0.021	0.042	0.052
120-12-7	Anthracene	0.042	U	0.021	0.042	0.052
56-55-3	Benzo(a)anthracene	0.042	U	0.021	0.042	0.052
50-32-8	Benzo(a)pyrene	0.042	U	0.021	0.042	0.052
205-99-2	Benzo(b)fluoranthene	0.042	U	0.021	0.042	0.052
191-24-2	Benzo(g,h,i)perylene	0.042	U	0.021	0.042	0.052
207-08-9	Benzo(k)fluoranthene	0.042	U	0.021	0.042	0.052
218-01-9	Chrysene	0.042	U	0.021	0.042	0.052
53-70-3	Dibenzo(a,h)anthracene	0.042	U	0.021	0.042	0.052
206-44-0	Fluoranthene	0.042	U	0.021	0.042	0.052
86-73-7	Fluorene	0.042	U	0.021	0.042	0.052
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	U	0.021	0.042	0.052
91-20-3	Naphthalene	0.042	U	0.021	0.042	0.052
85-01-8	Phenanthrene	0.023	J	0.021	0.042	0.052
129-00-0	Pyrene	0.042	U	0.021	0.042	0.052

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW014-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199701 Lab File ID: 997-01.D

Sample wt/vol: 960 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0432

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0017	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.009	U	0.0045	0.009	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.004	0.0079	0.052
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0017	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.52

JPC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW015-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199702 Lab File ID: 997-02.D

Sample wt/vol: 950 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0449

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0063	U	0.0032	0.0063	0.053
319-85-7	beta-BHC	0.0025	U	0.0013	0.0025	0.053
319-86-8	delta-BHC	0.0063	U	0.0032	0.0063	0.053
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.053
76-44-8	Heptachlor	0.0083	U	0.0042	0.0083	0.053
309-00-2	Aldrin	0.0034	U	0.0017	0.0034	0.053
1024-57-3	Heptachlor epoxide	0.0029	U	0.0015	0.0029	0.053
959-98-8	Endosulfan I	0.009	U	0.0045	0.009	0.053
60-57-1	Dieldrin	0.0057	U	0.0028	0.0057	0.053
72-55-9	4,4'-DDE	0.008	U	0.004	0.008	0.053
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.053
33213-65-9	Endosulfan II	0.0034	U	0.0017	0.0034	0.053
72-54-8	4,4'-DDD	0.0055	U	0.0027	0.0055	0.053
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.053
50-29-3	4,4'-DDT	0.0023	U	0.0012	0.0023	0.053
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.053
7421-93-4	Endrin aldehyde	0.0032	U	0.0016	0.0032	0.053
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.053
5103-71-9	alpha-Chlordane	0.0063	U	0.0032	0.0063	0 053
53494-70-5	Endrin ketone	0.013	U	0.0063	0.013	0.053
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.53

JC 4/14/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW016-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199703 Lab File ID: 997-03.D

Sample wt/vol: 940 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0507

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0064	U	0.0032	0.0064	0.053
319-85-7	beta-BHC	0.0026	U	0.0013	0.0026	0.053
319-86-8	delta-BHC	0.0064	U	0.0032	0.0064	0.053
58-89-9	gamma-BHC (Lindane)	0.0051	U	0.0026	0.0051	0.053
76-44-8	Heptachlor	0.0084	U	0.0042	0.0084	0.053
309-00-2	Aldrin	0.0034	U	0.0017	0.0034	0.053
1024-57-3	Heptachlor epoxide	0.003	U	0.0015	0.003	0.053
959-98-8	Endosulfan I	0.0091	U	0.0046	0.0091	0.053
60-57-1	Dieldrin	0.0057	U	0.0029	0.0057	0.053
72-55-9	4,4'-DDE	0.0081	U	0.004	0.0081	0.053
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.053
33213-65-9	Endosulfan II	0.0034	U	0.0017	0.0034	0.053
72-54-8	4,4'-DDD	0.0055	U	0.0028	0.0055	0.053
1031-07-8	Endosulfan sulfate	0.0021	U	0.0011	0.0021	0.053
50-29-3	4,4'-DDT	0.0023	U	0.0012	0.0023	0.053
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.053
7421-93-4	Endrin aldehyde	0.0032	U	0.0016	0.0032	0.053
5103-74-2	gamma-Chlordane	0.0051	U	0.0026	0.0051	0.053
5103-71-9	alpha-Chlordane	0.0064	U	0.0032	0.0064	0.053
53494-70-5	Endrin ketone	0.013	U	0.0064	0.013	0.053
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.53

JC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW017-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199706 Lab File ID: 997-06.D

Sample wt/vol: 965 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0600

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.0039	0.0079	0.052
72-20-8	Endrin	0.0037	U	0.0019	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0019	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.19	0.37	0.52

2/14/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709 Lab File ID: 997-09.D

Sample wt/vol: 965 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0636

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.0039	0.0079	0.052
72-20-8	Endrin	0.0037	U	0.0019	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0019	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.19	0.37	0.52

JC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710 Lab File ID: 997-10.D

Sample wt/vol: 975 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0654

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.051
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.051
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.051
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.051
76-44-8	Heptachlor	0.0081	U	0.0041	0.0081	0.051
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.051
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.051
959-98-8	Endosulfan I	0.0088	U	0.0044	0.0088	0.051
60-57-1	Dieldrin	0.0055	U	0.0028	0.0055	0.051
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.051
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.051
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.051
72-54-8	4,4'-DDD	0.0053	U	0.0027	0.0053	0.051
1031-07-8	Endosulfan sulfate	0.002	U	0.001	0.002	0.051
50-29-3	4,4'-DDT	0.0022	U	0.0011	0.0022	0.051
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.051
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.051
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.051
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.051
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.051
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.51

JC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708 Lab File ID: 997-08.D

Sample wt/vol: 970 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0618

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.052
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.052
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.52

JMC 4/14/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB02-020711

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199711 Lab File ID: 997-11.D

Sample wt/vol: 975 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 10 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/10/11 Time: 0711

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.051
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.051
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.051
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.051
76-44-8	Heptachlor	0.0081	U	0.0041	0.0081	0.051
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.051
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.051
959-98-8	Endosulfan I	0.0088	U	0.0044	0.0088	0.051
60-57-1	Dieldrin	0.0055	U	0.0028	0.0055	0.051
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.051
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.051
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.051
72-54-8	4,4'-DDD	0.0053	U	0.0027	0.0053	0.051
1031-07-8	Endosulfan sulfate	0.002	U	0.001	0.002	0.051
50-29-3	4,4'-DDT	0.0022	U	0.0011	0.0022	0.051
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.051
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.051
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.051
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.051
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.051
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.51

4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708 Lab File ID: 997-08.D

Sample wt/vol: 970 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 2 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1524

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

JAC 4/14/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709 Lab File ID: 997-09.D

Sample wt/vol: 970 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 2 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1539

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

JAC 4/14/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710 Lab File ID: 997-10.D

Sample wt/vol: 975 Units: ML Date Received: 02/08/11

Concentrated Extract Volume: 2 Date Extracted: 02/09/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 1554

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.02	U	0.015	0.02	0.02
11096-82-5	Aroclor-1260	0.02	U	0.01	0.02	0.02
11104-28-2	Aroclor-1221	0.02	U	0.018	0.02	0.02
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.02
53469-21-9	Aroclor-1242	0.02	U	0.013	0.02	0.02
12672-29-6	Aroclor-1248	0.011	U	0.0053	0.011	0.02
11097-69-1	Aroclor-1254	0.0098	U	0.0049	0.0098	0.02

JAC 41411

Results reported on Primary Column, if RPD >40% results flagged accordingly.

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW014-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199701

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~160~~ 186	J	U MBL	P	93	186	1000
7440-39-3	Barium	33.4	J	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	519000			P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	1570000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0514	~~J~~	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	533000			P	717	1430	5000
7782-49-2	Selenium	113			P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

I70311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW014-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199701DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	13600000			P	18000	30000	30000

jac 4/14/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW015-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199702

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~154~~ 186	✓	U MBL	P	93	186	1000
7440-39-3	Barium	29.6	+	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	503000			P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	1550000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0516	+	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	514000			P	717	1430	5000
7782-49-2	Selenium	102			P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JC 4/14/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

170311 1710

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW015-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199702DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	13600000			P	18000	30000	30000

JHC 4/14/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW016-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FLS

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199703

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	428	J		P	93	186	1000
7440-39-3	Barium	33.9	~~J~~	~~J~~ ESD	P	2.2	4.4	100
7440-41-7	Beryllium	~~1.76~~ 2.4	~~J~~	U MRL	P	1.2	2.4	36.5
7440-70-2	Calcium	539000			P	390	780	1000
7439-89-6	Iron	201	J		P	55	110	400
7439-95-4	Magnesium	1620000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	~~U~~	UJ ~~N~~ MRL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	533000			P	717	1430	5000
7782-49-2	Selenium	99.6			P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JMC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW016-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199703DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	13800000			P	18000	30000	30000

JRC 4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.
VWW06-SW017-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199706

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	282	J		P	93	186	1000
7440-39-3	Barium	31.7	~~J~~ J SD		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	512000			P	390	780	1000
7439-89-6	Iron	~~84~~ 110	✓	U MSL	P	55	110	400
7439-95-4	Magnesium	1520000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	~~U~~ UJ MSL		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	521000			P	717	1430	5000
7782-49-2	Selenium	50.7	J		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 4/14/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW017-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199706DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	13200000			P	18000	30000	30000

JJC 4/14/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1710

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	316	J		P	93	186	1000
7440-39-3	Barium	8.09	J	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	393000			P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	1200000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0401	J	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	417000			P	717	1430	5000
7782-49-2	Selenium	70.1	J		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	5.3	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 4/14/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1719

042

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW001-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10500000			P	9000	15000	15000

JHC 4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	446	J		P	93	186	1000
7440-39-3	Barium	9.36	~~J~~	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	392000			P	390	780	1000
7439-89-6	Iron	118	J		P	55	110	400
7439-95-4	Magnesium	1220000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	~~J~~	UJ MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	415000			P	717	1430	5000
7782-49-2	Selenium	74.2	J		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW002-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10500000			P	9000	15000	15000

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1710

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	18.6	U		P	9.3	18.6	100
7440-39-3	Barium	0.423	J		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	78	U		P	39	78	100
7439-89-6	Iron	11	U		P	5.5	11	40
7439-95-4	Magnesium	17.2	J		P	9.8	19.6	100
7439-96-5	Manganese	0.7	U		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.86	U		P	0.93	1.86	4.1
7440-09-7	Potassium	143	U		P	71.7	143	500
7782-49-2	Selenium	8.2	U		P	4.1	8.2	9
7440-23-5	Sodium	361			P	180	300	300
7440-28-0	Thallium	8.8	U		P	4.4	8.8	10
7440-62-2	Vanadium	0.88	U		P	0.44	0.88	9
7440-66-6	Zinc	8	U		P	4	8	20

JAC 4/14/16

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB02-020711

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199711

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	51.2	J		P	9.3	18.6	100
7440-39-3	Barium	0.801	J		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	162			P	39	78	100
7439-89-6	Iron	68.8			P	5.5	11	40
7439-95-4	Magnesium	245			P	9.8	19.6	100
7439-96-5	Manganese	3.34	J		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.34	J		P	0.93	1.86	4.1
7440-09-7	Potassium	170	J		P	71.7	143	500
7782-49-2	Selenium	8.2	U		P	4.1	8.2	9
7440-23-5	Sodium	3980			P	180	300	300
7440-28-0	Thallium	8.8	U		P	4.4	8.8	10
7440-62-2	Vanadium	0.88	U		P	0.44	0.88	9
7440-66-6	Zinc	24			P	4	8	20

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW014-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199701

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~118~~ 186	J	U MDL	P	93	186	1000
7440-39-3	Barium	26.4	J	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	535000			P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	1640000		J MSL	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0621	J	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	533000			P	717	1430	5000
7782-49-2	Selenium	100		J MSH	P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 2/14/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW014-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199701DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	13900000			P	18000	30000	30000

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW015-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199702

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~155~~ 186	✓	U MDL	P	93	186	1000
7440-39-3	Barium	26.6	+	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	556000			P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	1680000		J MSL	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0551	+	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	550000			P	717	1430	5000
7782-49-2	Selenium	114		J MSH	P	41	82	90
7440-28-0	Thallium	~~70.1~~ 88	✓	U MDL	P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JMC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW015-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199702DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	14500000			P	18000	30000	30000

JMC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

170311 1710

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW016-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199703

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	252	J		P	93	186	1000
7440-39-3	Barium	28	~~J~~	J ESD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	553000			P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	1690000		J MSL	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0469	~~J~~	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	552000			P	717	1430	5000
7782-49-2	Selenium	82	U	~~N~~	P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	~~5.2~~ 8.8	~~J~~	U MBL	P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JMC 4/14/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW016-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199703DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	15600000			P	18000	30000	30000

4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW017-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199706

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	200	J		P	93	186	1000
7440-39-3	Barium	28.4	J	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	548000			P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	1690000		J MSL	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.053	J	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	539000			P	717	1430	5000
7782-49-2	Selenium	82	U		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	5.37	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW017-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199706DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	13700000			P	18000	30000	30000

JAC 4411

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311.1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	186	U		P	93	186	1000
7440-39-3	Barium	6.83	J	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	400000			P	390	780	1000
7439-89-6	Iron	318	J		P	55	110	400
7439-95-4	Magnesium	1270000		J MSL	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0434	J	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	408000			P	717	1430	5000
7782-49-2	Selenium	82	U		P	41	82	90
7440-28-0	Thallium	~~50.7~~ 88	J	U MBL	P	44	88	100
7440-62-2	Vanadium	4.67	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW001-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10400000			P	9000	15000	15000

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~136~~ 186	✓	U MSL	P	93	186	1000
7440-39-3	Barium	7.36	✓	J SD	P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	400000			P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	1260000		J MSL	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0475	✓	J MSL	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	409000			P	717	1430	5000
7782-49-2	Selenium	50.5	✓	J MSH	P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

SJC 4/14/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW002-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710DL1

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10300000			P	9000	15000	15000

JJC 4/14/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

1/2011 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	18.6	U		P	9.3	18.6	100
7440-39-3	Barium	0.221	J		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	78	U		P	39	78	100
7439-89-6	Iron	11	U		P	5.5	11	40
7439-95-4	Magnesium	11	J		P	9.8	19.6	100
7439-96-5	Manganese	0.7	U		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.86	U		P	0.93	1.86	4.1
7440-09-7	Potassium	143	U		P	71.7	143	500
7782-49-2	Selenium	5.2	J		P	4.1	8.2	9
7440-23-5	Sodium	198	J		P	180	300	300
7440-28-0	Thallium	4.68	J		P	4.4	8.8	10
7440-62-2	Vanadium	0.88	U		P	0.44	0.88	9
7440-66-6	Zinc	8	U		P	4	8	20

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1719

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW001-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Lab Sample ID: K0205-06

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U		MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U	N	MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JAC 41411

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW002-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Lab Sample ID: K0205-07

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U		MS	100	100	1000
7440-38-2	Arsenic	250	U	~~N~~	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U		MS	80.0	500	1000
7440-48-4	Cobalt	100 ~~37.5~~	~~B~~	U MBL	MS	12.0	100	500
7440-50-8	Copper	250	U	~~N~~	MS	120	250	2500
7439-92-1	Lead	20 ~~19.5~~	~~B~~	U MBL	MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JAC 4/14/11

Comments:

ISM_002 FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW014-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Lab Sample ID: K0205-01

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50 ~~39.2~~	~~B N~~ U MBL		MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	50	U		MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JAC 41411

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW015-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Lab Sample ID: K0205-02

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500	U		MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U	N	MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JMC 4/14/11

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW016-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Lab Sample ID: K0205-03

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500 ~~129~~	~~B~~	U EBL	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	149	~~B~~	~~N~~ J	MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JAC 4/4/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW017-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Lab Sample ID: K0205-04

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	~~113~~ 250	~~B~~ N	U MBL	MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	~~111~~ 500	~~B~~	U EBL	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JAC 4/14/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-EB01-020711

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Lab Sample ID: K0205-05

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.64	~~B~~	J	MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.26	~~B N~~	J	MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	0.37	~~B~~	J	MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.11	~~B~~	J	MS	0.024	0.20	1.0
7440-50-8	Copper	0.5	U	~~N~~	MS	0.23	0.50	5.0
7439-92-1	Lead	0.2	U		MS	0.068	0.20	1.0
7440-22-4	Silver	0.05	U		MS	0.022	0.050	1.0

JAC 4/4/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-EB02-020711

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Lab Sample ID: K0205-08

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.57	~~B~~	J	MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.5	U	~~N~~	MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	1.0	~~B~~	J	MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.060	~~B~~	J	MS	0.024	0.20	1.0
7440-50-8	Copper	0.26	~~B~~	~~N~~ J	MS	0.23	0.50	5.0
7439-92-1	Lead	0.60	~~B~~	J	MS	0.068	0.20	1.0
7440-22-4	Silver	0.05	U		MS	0.022	0.050	1.0

JMC 4/4/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
VWW06-SW001-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Matrix (soil/water): WATER Lab Sample ID: K0205-06

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Dissolved

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U		MS	100	100	1000
7440-38-2	Arsenic	250	U	W	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	W	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U	W	MS	120	250	2500
7439-92-1	Lead	20	U	W	MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JAC 4/4/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW002-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Matrix (soil/water): WATER Lab Sample ID: K0205-07

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Dissolved

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	100	U		MS	100	100	1000
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500 ~~104~~	~~B~~ N	U FBL	MS	80.0	500	1000
7440-48-4	Cobalt	100 ~~34.4~~	~~B~~	U MBL	MS	12.0	100	500
7440-50-8	Copper	250	U	N	MS	120	250	2500
7439-92-1	Lead	20 ~~18.9~~	~~B~~ N	U MBL	MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JBC 4/14/11

Comments:

ISM_002

FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW014-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Matrix (soil/water): WATER Lab Sample ID: K0205-01

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Dissolved

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50 ~~43.7~~	~~B~~ N	U MBL	MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100 ~~26.1~~	~~B~~ N	U EBL	MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	50	U	~~N~~	MS	23.0	50.0	500
7439-92-1	Lead	20	U	~~N~~	MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JAC 4/4/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW015-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Matrix (soil/water): WATER Lab Sample ID: K0205-02

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Dissolved

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500 ~~123~~	~~B~~ U	N EBL	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U	N	MS	120	250	2500
7439-92-1	Lead	20	U	N	MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JMC 4/4/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW016-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Matrix (soil/water): WATER Lab Sample ID: K0205-03

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Dissolved

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250 ~~106~~	~~B~~ U MBL		MS	95.0	250	1000
7440-43-9	Cadmium	100	U		MS	42.0	100	500
7440-47-3	Chromium	500	U	M	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U	N	MS	120	250	2500
7439-92-1	Lead	20	U	N	MS	6.8	20.0	100
7440-22-4	Silver	25	U		MS	11.0	25.0	500

JMC 4/14/11

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW017-0211

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Matrix (soil/water): WATER Lab Sample ID: K0205-04

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

Dissolved

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U	N	MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500 ~~135~~	~~B~~ N	U EBL	MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U	N	MS	120	250	2500
7439-92-1	Lead	20	U	N	MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JMC 4/14/11

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-EB01-020711

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Matrix (soil/water): WATER Lab Sample ID: K0205-05

Level (low/med): MED Date Received: 02/08/2011

% Solids: 0.0

Dissolved

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.52	~~B~~	J	MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.5	U	N	MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	0.34	~~B~~	N J	MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.2	U		MS	0.024	0.20	1.0
7440-50-8	Copper	0.5	U	N	MS	0.23	0.50	5.0
7439-92-1	Lead	0.2	U	N	MS	0.068	0.20	1.0
7440-22-4	Silver	0.05	U		MS	0.022	0.050	1.0

JMC 4/4/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW014-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199701

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.053			SP	0.0035	0.007	0.01

VM 041211

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW015-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199702

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.044			SP	0.0035	0.007	0.01

J, HT

WW 04/21/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170911 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW016-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199703

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.043			SP	0.0035	0.007	0.01

J, HT

VW 2/4/2011

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW017-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199706

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: *MG/L*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.097			SP	0.0035	0.007	0.01

J, HT

WW 041211

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: *MG/L*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

UJ, HT

WW 041211

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

VW 041211

Color Before: Clarity Before: Texture :

Color After : Clarity After: Artifacts:

Comments:

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

UJ, HT

WM 04/12/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB02-020711

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199711

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

VM 2/4/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW014-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199701

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.016			SP	0.0035	0.007	0.01

J, HT

WW 041211

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW015-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199702

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.019			SP	0.0035	0.007	0.01

J, HT

VWW 041211

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW016-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199703

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.038			SP	0.0035	0.007	0.01

I, HT

WW 041211

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW017-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199706

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.02			SP	0.0035	0.007	0.01

J, HT

WW 041211

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020711

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199708

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	~~U~~		SP	0.0035	0.007	0.01

UJ, HT

WW 041211

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199709

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

UJ, HT

WW 041211

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1720

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Lab Sample ID: 350199710

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

UJ, HT

VM 041211

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

170311 1720

PEL

A Division of SPECTRUM ANALYTICAL, INC. featuring HANNIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3501997

Page 1 of 1

08

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni/WDC
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
703-376-5111 michael.zamboni@ch2m.com
Project Mgr.: Bill Hennah / WBO

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 402244.FI.SW.06 CTO 111
Site Name: SWMU 6
Location: Vieques State: PR
Sampler(s): D. Bolton J. Martin

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8=$NaHSO_4$ 9=_____ 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	~~PEST/PCBs~~	Analyses: Metals	F Metals	PEST/PCBs	VOCs	PAHs	QA/QC Reporting Level
-01	VIWW06-SW014-021	2/7/11	0910		Aq		2		6		✓	✓	✓ PEST			☐ Level I ☐ Level II ☐ Level III ☐ Level IV ☐ Other
-02	VIWW06-SW015-021	2/7/11	0850		Aq		2		6		✓	✓	✓ PEST			
-03-04-05	VIWW06-SW016-021	2/7/11	0805		Aq	6	6	—	18		✓	✓	✓ PEST			MS/MSD
-06	VIWW06-SW017-021	2/7/11	745		Aq	—	2	—	6		✓	✓	✓ PEST			
-07	VIWAE-TB01-021 DUP	2/7/11	0600		Aq	3								✓		
-08	VIWAE-EB01-021 DUP	2/7/11	0610		Aq	3	5	—	6		✓	✓	✓	✓	✓	
-09	VIWW06-SW001-021	2/7/11	1030		Aq	3	5		6		✓	✓	✓	✓	✓	60260L and
-10	VIWW06-SW002-021	2/7/11	0945		AQ	3	5		6		✓	✓	✓	✓	✓	60200_CL Sent to
-11	VIWAE-EB02-021 DUP	2/7/11	1120		AQ		2		3		✓		✓ PEST			mithem
	Parent															

☐ E-mail to pltl2 6010, 6010B, 6020, 6020B, 8260
EDD Format double ombros received
Sample 10 = two 8260 vials broken in transit

Condition upon receipt: ☒ Iced ☐ Ambient ☒ °C 1.6, 4.6, 4.1, 3.1

Relinquished by:	Received by:	Date:	Time:
		2-8-11	830

3501997 091 651

FedEx International Air Waybill

Express

Origin Copy

FedEx Tracking Number 8607 5366 7794 Form ID No. 0107

From

Date 02/27/ Sender's FedEx Account Number 186718208

Sender's Name [illegible] Phone [illegible]

Company [illegible]

Address [illegible]

Address [illegible]

City [illegible] State/Province [illegible]

Country USA ZIP/Postal Code [illegible]

To

Recipient's Name John Heyman Phone 813 888 [illegible]

Company PEL Labs - Sample Receiving

Address [illegible]

Dept./Floor

Address [illegible]

City [illegible] State/Province FL

Country USA ZIP/Postal Code [illegible]

Recipient's Tax ID Number for Customs Purposes (GST/RFC/VAT/TIN/EIN/IDN, if applicable required)

Shipment Information

For EU Duty: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Paper's Load and Count/SLAC) 1 Total Weight 50 lbs. kg DIM L / W / H in. cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
Samples		USA	[illegible]

ED been filed in AES? (or Only: Check One) ☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

VSED required, enter exemption number: If other than NLR, enter License Exception:

Enter AES proof of filing citation:

Total Declared Value for Carriage [illegible]

Total Value for Customs (Specify Currency) [illegible]

4 Express Package Service

Packages up to 150 lbs. / 68 kg — For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

Not all services and options are available to all destinations. Dangerous goods cann be shipped using this Air Waybill.

1 ☒ FedEx Intl. Priority

6 ☐ FedEx Intl. First — Available to select locations. Higher rates apply.

☐ ___ 3 ☐ FedEx Intl. Economy — FedEx Envelope and FedEx Pak rate not available.

5 Packaging

*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☒ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube

1 ☒ Other [illegible] PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling

1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery — Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:*

Enter FedEx Acct. No. or Credit Card No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check/Cheque

FedEx Acct. No. 186718208 Total Transportation

Credit Card Exp. Date Specify Currency

7b Payment *Bill duties and taxes to:*

ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash Check/Cheque

FedEx Acct. No. 186718208

8 Your Internal Billing Reference

First 24 characters will appear on invoice.

[illegible]

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature: [illegible]

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

521

PART 158410 Rev. Date 4/06 ©1994–2006 FedEx PRINTED IN U.S.A.

FedEx Tracking Number 8607 5366 7794 0402

Form ID No.

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FNJX	TPA	XJTPT	Total Volume (cm)

Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station

Forms Attached: ☐ CI ☐ CO

Base Charges [illegible] Declared Val. Chrg. ___ Other ___ COD/GPA ___ Credit Card Auth. ___

FedEx Emp. # ___ Audit Emp. # ___ Date ___ Time ___ Del. Courier Emp. # ___ Date ___ Time ___

Non-Negotiable International Air Waybill • ©1994–2006 FedEx

FedEx Express International Air Waybill

FedEx Tracking Number 8747 2112 6449 Origin ID 0402

From

Date 2/7/11 Sender's FedEx Account Number 186718208

Sender's Name Dennis Ballam Phone 757-671-6286

Company CH2M Hill

Address Camp Garaia

Address BLDG 4525

City VIEQUES State/Province PR

Country USA ZIP/Postal Code 00765

To

Recipient's Name John Heyman Phone 813-888950

Company PEL LABs Sample Receiving

Address 8405 Benjamin Rd. Dept/Floor

Address SUITE A

City TAMPA State/Province FL

Country USA ZIP/Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g., GST/RFC/VAT/IN/EIN/ABN, or as locally required.

Shipment Information For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 lbs. kg DIM L / W / H in. cm

Commodity Description	Harmonized Code	Country of Manufacture	Value for Customs
H2O Samples		USA	NCV

EEI been filed in AES? U.S. Export Only: Check One
☐ No EEI required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.
No EEI required, enter exemption number:
Yes – Enter AES proof of filing citation:
Neither than NLR, enter License Exception:

Total Declared Value for Carriage 0

Total Value for Customs (Specify Currency) NCV

4 Express Package Service *Packages up to 150 lbs./68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.*

1 ☒ FedEx Intl. Priority 6 ☐ FedEx Intl. First (Available to select locations.)
☐ 3 FedEx Intl. Economy (FedEx Envelope and FedEx Pak rate not available.)

Not all services an options are availal to all destinations. Dangerous goods c be shipped using t Air Waybill.

5 Packaging *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☐ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube
1 ☒ Other PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling
1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery (Available to select locations for FedEx Intl. Priority only.)

7 Payment Complete payment options for both transportation charges and duties and taxes.

Bill transportation charges to: Enter FedEx Acct. No. or Credit Card No. below.
1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash Check/Cheque
FedEx Acct. No. 186718208 Total Transportation
Credit Card Exp. Date Specify Currency

Bill duties and taxes to: Enter FedEx Acct. No. below. ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.
1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 5 ☐ Cash Check/Cheque
FedEx Acct. No. 186718208

8 Your Internal Billing Reference First 24 characters will appear on invoice.
404422.FI.SU

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature: [signature]

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Carriage as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

568

PART 158410 Rev. Date 11/08 ©1994–2008 FedEx PRINTED IN U.S.A.

FedEx Tracking Number 8747 2112 6449 0402 Form ID No.

Origin Station ID	Country Code/Destination Station ID	URSA Routing	Handling Units
STJ	PSE	XJ PSE	Total Volume (cm)

Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station Forms Attached: ☐ ☐

Base Charges 78.50 Declared Val. Charg. Other ODA/DPA Credit Card Auth.
FedEx Emp. # Audit Emp. # Date Time Del. Center Emp. # Date Time

Non-Negotiable International Air Waybill • ©1994–2

FedEx Express *International Air Waybill*

Origin Copy

From

Date 02/07/11 Sender's FedEx Account Number 1867182008

Sender's Name Jake Crosthe Phone 757 611 6206

Company CHEM H[illegible]

Address Camp Gueiris

Address [illegible]

City [illegible] State Province [illegible]

Country USA ZIP Postal Code [illegible]

To

Recipient's Name John Heyman Phone 813-888-7507

Company PEL Labs. Sample Receiving

Address 8405 Benjamin Rd

Dept./Floor

Address Suite A

City Tampa State Province FL

Country USA ZIP Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
GST/RFC/VAT/IN/EIN/ABN, or as locally required.

Shipment Information ☐ For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages 1 Total Weight 56 lbs. ☐ kg ☐ DIM L / W / H in. ☐ cm ☐

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
Sample.		USA	[illegible]

ED been filed in AES? ☐ No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR. | Total Declared Value for Carriage USD | Total Value for Customs (Specify Currency) 0

SED required, enter exemption number: If other than NLR, enter License Exception:

Enter AES proof of filing citation:

4 Express Package Service *Packages up to 150 lbs./68 kg* *For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.*

☒ FedEx Intl. Priority 6 ☒ FedEx Intl. First Available to select locations. Higher rates apply.

☐ 3 ☐ FedEx Intl. Economy FedEx Envelope and FedEx Pak rate not available.

Not all services and options are available to all destinations. Dangerous goods cann be shipped using this Air Waybill.

5 Packaging *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☐ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube
1 ☒ Other cooler PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling

1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:*

Enter FedEx Acct. No. or Credit Card No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 4 ☐ Credit Card 5 ☐ Cash Check/Cheque

FedEx Acct. No. 1867182008 [redacted]

Total Transportation

Credit Card Exp. Date Specify Currency

7b Payment *Bill duties and taxes to:* ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash Check/Cheque

FedEx Acct. No. 1867182008

8 Your Internal Billing Reference First 24 characters will appear on invoice.
408422.FI SW

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

521

PART 158410 Rev. Date 4/05 ©1994-2005 FedEx PRINTED IN U.S.A.

FedEx Tracking Number 8607 5366 7809 Form ID No. 0402

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FN JO	TPF	XJ TPF	Total Volume (cm)

Received At: 1 ☐ Reg. Stop 2 ☒ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station | Forms Attached: ☐ CI ☐ CO

Base Charges / Declared Val. Chrg. / Other / ODA/OPA / Credit Card Auth.

FedEx Emp. # 70570 / Audit Emp. # / Date / Time / Del. Courier Emp. # / Date / Time

Non-Negotiable International Air Waybill • ©1994-2005 FedEx

094

FedEx Express International Air Waybill

Origin Copy

8716 9321 9399 0402

From

Date 2/7/11 Sender's FedEx Account Number 186718208

Sender's Name JAKE Crostic Phone 757-671-62866

Company CH2M HILL

Address Camp Garcia

Address BLDG 4525

City VIEQUES State Province PR

Country USA ZIP Postal Code 00765

To

Recipient's Name John Heyman Phone 813-888-9507

Company PEL LABS - Sample Receiving

Address 8405 Benjamin RD Dept/Floor

Address SUITE A.

City TAMPA State Province FL

Country USA ZIP Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g., GST/RFC/VAT/IN/EIN/ABN, or as locally required.

4 Express Package Service — *Packages up to 150 lbs./68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.*

- 1 [X] FedEx Intl. Priority
- 2 [X] FedEx Intl. First — Available to select locations. Higher rates apply.
- 3 [ ] FedEx Intl. Economy — FedEx Envelope and FedEx Pak rate not available.

5 Packaging — *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

- 6 [X] FedEx Envelope
- 2 [ ] FedEx Pak
- 3 [ ] FedEx Box
- 4 [ ] FedEx Tube
- [X] Other
- PW [ ] FedEx 10kg Box*
- PX [ ] FedEx 25kg Box*

6 Special Handling

1 [ ] HOLD at FedEx Location 3 [ ] SATURDAY Delivery — Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:*

Enter FedEx Acct. No. or Credit Card No. below.

1 [X] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 4 [ ] Credit Card 5 [ ] Cash Check/Cheque

FedEx Acct. No. 186718208 Total Transportation

Credit Card Exp. Date Specify Currency

7b Payment *Bill duties and taxes to:* ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 [X] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 5 [ ] Cash Check/Cheque

FedEx Acct. No. 186718208

8 Your Internal Billing Reference First 24 characters will appear on invoice.

464422. FI.SW.

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature: *This is not authorization to deliver this shipment without a recipient signature.*

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

521

PART 158410 Rev. Date 4/06 ©1994–2006 FedEx PRINTED IN U.S.A.

Form ID No.

Shipment Information [ ] For EU Duty: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 [X] lbs. [ ] kg DIM L / W / H [ ] in. [ ] cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
1/2 0 Samples		VSA	NCV
			0

/SED been filed in AES? Export Only: Check One [ ] No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

EEI/SED required, enter exemption number:

If other than NLR, enter License Exception:

Total Declared Value for Carriage VD

Total Value for Customs (Specify Currency) NCV

– Enter AES proof of filing citation.

FedEx Tracking Number 8716 9321 9399 0402

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FNW	TPF	NTPF	Total Volume (cm)

Received At 1 [ ] Reg. Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] World Service Center 5 [ ] Station

Forms Attached: [ ] CI [ ] CO

Base Charges Declared Val. Chrg. Other ODA/GPA Credit Card Auth.

FedEx Emp. # 1040 Audit Emp. # Date Time Del. Courier Emp. # Date Time

Non-Negotiable International Air Waybill • ®1994–2006 Fe

3501997 095 655

PEL, a Division of Spectrum Analytical, Inc.

pH LOG SHEET

Work Order # 3501997 By NK

Client / Project Name Cham Hill / Vieques / SWMU 6 / 402244.FT.SW.06 CTO11 Date 2-8-11

PEL Sample Number	H_2SO_4 (pH<2)		HNO_3 (pH<2)		NaOH (pH>12)		ZnAC/NaOH (pH>9)		HCl (pH<2) 8260		Other ____ pH ____	
	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH
01			4	<2								
02			↓	↓								
03												
04												
05												
06			↓	↓								
07			—	—					3	<2		
08			4	<2					3	↓		
09			4	↓					3			
10			4						1			
11			2	↓								
12												
13												
14												
15												
16												
17												
18												
19												
20												

3501997

096

656

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	3501997	**Req:**	90619
Client:	CH2M Hill	**Project:**	CTO-083 / CTO-111 SWMU 6
Level:	4	**Date Rec'd:**	2/8/2011 8:30:00 AM
Rec'd via:	Fed-Ex	**Due Date:**	2/22/2011

Sample Verification

Samples/Cooler Secure?	Yes	**All Samples on COC accounted For?**	Yes
Temperature of Samples(Celsius)	1.6C-4.6C	**All Samples Rec'd Intact?**	Yes
pH Verified?	Yes	**Sample Vol. Sufficient For Analysis**	Yes
pH WNL?	Yes	**Samples Rec'd W/I Hold Time?**	Yes
Soil Origin (Domestic/Foreign):		**Are All Samples to be Analyzed?**	Yes
Site Location/Project on COC?	Yes	**Correct Sample Containers?**	Yes
Client Project # on COC?	Yes	**COC Comments written on COC?**	Yes
Project Mgr. Indicated on COC?	Yes	**Samplers Initials on COC?**	Yes
COC relinquished/Dated by Client?	Yes	**Sample Date/Time Indicated?**	Yes
COC Received/Dated by PEL?	Yes	**TAT Requested:**	STD
Specific Subcontract Indicated?	No	**Client Requests Verbal Results?**	No
Samples Received By	Fed-Ex	**Client Requests Faxed Results?**	No
PEL to Conduct ALL Analyses?	Yes		
Radioactivity Check?	No		
COC Present?	Yes		

PEER REVIEW _____

Client: CH2M Hill

WONo: 3501997 Profile Name: Vieques Profile #: 90619

MATRIX W

Sample #	Bottle	Parameter		Check	Received	Date
01	006	6010	Metals	In	Nicole Labus	2/8/2011 10:44:17 AM
01	006	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:32 PM
01	006	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:10 PM
01	004	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:20 AM
01	004	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:15 PM
01	004	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:34 PM
01	002	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:05 AM
01	002	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:51 AM
01	002	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:35 PM
01	003	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:49 AM
01	003	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:30:55 AM
01	003	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:11 PM
01	006	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:17 AM
01	006	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:01 AM
01	006	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:35 PM
01	004	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:20 AM
01	004	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:04 AM
01	006	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:20:13 PM
01	006	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:20:23 PM
01	008	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:30 PM
01	007	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:31 PM
01	008	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:14 AM
02	005	6010	Metals	In	Nicole Labus	2/8/2011 10:44:13 AM
02	005	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:35 PM
02	005	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:13 PM
02	004	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:21 AM
02	004	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:19 PM
02	004	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:37 PM

02	006	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:07 AM
02	006	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:49 AM
02	006	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:37 PM
02	007	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:52 AM
02	007	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:30:56 AM
02	007	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:14 PM
02	005	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:13 AM
02	005	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:04 AM
02	005	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:44 PM
02	004	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:21 AM
02	004	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:08 AM
02	004	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:21:04 PM
02	008	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:27 PM
02	002	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:29 PM
02	002	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:18 AM
03	002	6010	Metals	In	Nicole Labus	2/8/2011 10:44:11 AM
03	002	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:39 PM
03	002	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:15 PM
03	006	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:22 AM
03	006	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:22 PM
03	006	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:38 PM
03	003	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:09 AM
03	003	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:48 AM
03	003	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:39 PM
03	007	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:54 AM
03	007	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:30:58 AM
03	007	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:16 PM
03	002	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:11 AM
03	002	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:08 AM
03	002	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:46 PM
03	006	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:22 AM

03	006	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:11 AM
03	006	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:21:21 PM
03	001	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:19 PM
03	008	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:21 PM
03	001	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:20 AM
04	005	6010	Metals	In	Nicole Labus	2/8/2011 10:44:18 AM
04	005	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:43 PM
04	005	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:16 PM
04	007	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:27 AM
04	007	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:25 PM
04	007	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:41 PM
04	004	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:11 AM
04	004	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:46 AM
04	004	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:41 PM
04	001	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:56 AM
04	001	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:31:00 AM
04	001	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:17 PM
04	005	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:18 AM
04	005	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:11 AM
04	005	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:47 PM
04	007	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:27 AM
04	007	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:14 AM
04	007	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:21:28 PM
04	006	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:24 PM
04	003	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:25 PM
04	003	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:22 AM
05	003	6010	Metals	In	Nicole Labus	2/8/2011 10:44:20 AM
05	003	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:46 PM
05	003	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:17 PM
05	005	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:19 AM
05	005	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:28 PM

05	005	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:42 PM
05	006	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:12 AM
05	006	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:44 AM
05	006	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:42 PM
05	007	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:58 AM
05	007	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:31:01 AM
05	007	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:18 PM
05	003	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:20 AM
05	003	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:14 AM
05	003	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:48 PM
05	005	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:19 AM
05	005	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:17 AM
05	005	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:21:31 PM
05	001	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:17 PM
05	002	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:18 PM
05	001	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:24 AM
06	007	6010	Metals	In	Nicole Labus	2/8/2011 10:44:15 AM
06	007	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:50 PM
06	007	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:18 PM
06	005	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:24 AM
06	005	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:32 PM
06	005	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:43 PM
06	006	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:15 AM
06	006	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:29 AM
06	006	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:45 PM
06	008	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:00 AM
06	008	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:31:03 AM
06	008	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:20 PM
06	007	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:15 AM
06	007	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:18 AM
06	007	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:49 PM

WONo: 3501997 Profile Name: Vieques Profile #: 90619

06	005	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:24 AM
06	005	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:21 AM
06	005	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:21:33 PM
06	003	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:15 PM
06	004	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:15 PM
06	003	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:25 AM
07	001	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:33 AM
07	002	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:35 AM
07	003	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:36 AM
07	003	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:13:39 AM
08	005	6010	Metals	In	Nicole Labus	2/8/2011 10:44:21 AM
08	005	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:53 PM
08	005	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:19 PM
08	008	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:25 AM
08	008	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:35 PM
08	008	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:43 PM
08	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:17 AM
08	001	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:26 AM
08	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:47 PM
08	011	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:02 AM
08	011	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:30:53 AM
08	011	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:23 PM
08	005	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:21 AM
08	005	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:23 AM
08	005	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:50 PM
08	008	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:25 AM
08	008	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:24 AM
08	008	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:21:35 PM
08	004	8081	Pesticides	In	Russell Stallone	2/8/2011 6:13:10 PM
08	002	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:03 PM

08	006	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:11 PM
08	002	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:31 AM
08	003	8082L	PCB	In	Russell Stallone	2/8/2011 6:18:54 PM
08	004	8082L	PCB	Consumed	Devon Thompson	2/9/2011 8:27:20 AM
08	014	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:38 AM
08	009	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:39 AM
08	013	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:40 AM
08	014	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:13:43 AM
08	007	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/8/2011 11:29:14 AM
08	007	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/8/2011 11:29:37 AM
08	002	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/8/2011 6:19:41 PM
09	010	6010	Metals	In	Nicole Labus	2/8/2011 10:44:05 AM
09	010	6010	Metals	Out	Gerson Galvis	2/8/2011 1:02:57 PM
09	010	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:20 PM
09	013	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:17 AM
09	013	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:43 PM
09	013	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:44 PM
09	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:18 AM
09	001	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:23 AM
09	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:50 PM
09	009	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:04 AM
09	009	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:30:51 AM
09	009	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:24 PM
09	010	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:05 AM
09	010	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:28 AM
09	010	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:51 PM
09	013	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:17 AM
09	013	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:28 AM
09	013	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:21:36 PM
09	003	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:02 PM

09	004	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:09 PM
09	006	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:51 PM
09	006	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:36 AM
09	002	8082L	PCB	In	Russell Stallone	2/8/2011 6:18:52 PM
09	006	8082L	PCB	In	Russell Stallone	2/8/2011 6:19:51 PM
09	004	8082L	PCB	Consumed	Devon Thompson	2/9/2011 8:27:23 AM
09	007	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:42 AM
09	008	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:44 AM
09	014	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:45 AM
09	014	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:13:47 AM
09	005	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/8/2011 11:29:17 AM
09	005	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/8/2011 11:29:30 AM
09	003	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/8/2011 6:19:38 PM
09	006	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/8/2011 6:19:51 PM
10	011	6010	Metals	In	Nicole Labus	2/8/2011 10:44:09 AM
10	011	6010	Metals	Out	Gerson Galvis	2/8/2011 1:03:01 PM
10	011	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:21 PM
10	010	6010_D	Dissolved Metals	In	Nicole Labus	2/8/2011 10:42:07 AM
10	010	6010_D	Dissolved Metals	Out	Gerson Galvis	2/9/2011 1:25:47 PM
10	010	6010_D	Dissolved Metals	In	Gerson Galvis	2/9/2011 2:31:45 PM
10	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:21 AM
10	001	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:21 AM
10	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:52 PM
10	007	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/8/2011 9:00:06 AM
10	007	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/8/2011 11:30:49 AM
10	007	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/8/2011 2:01:28 PM
10	011	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:09 AM
10	011	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:32 AM
10	011	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:52 PM
10	010	7470_D	Mercury dissolved	In	Nicole Labus	2/8/2011 10:42:10 AM

WONo: 3501997 Profile Name: Vieques Profile #: 90619

10	010	7470_D	Mercury dissolved	Out	Gerson Galvis	2/9/2011 11:44:33 AM
10	010	7470_D	Mercury dissolved	In	Gerson Galvis	2/9/2011 1:21:38 PM
10	002	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:00 PM
10	003	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:24 PM
10	008	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:48 PM
10	008	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:38 AM
10	004	8082L	PCB	In	Russell Stallone	2/8/2011 6:18:50 PM
10	008	8082L	PCB	In	Russell Stallone	2/8/2011 6:19:48 PM
10	003	8082L	PCB	Consumed	Devon Thompson	2/9/2011 8:27:25 AM
10	005	8260	Volatile Organic Compounds	In	Nicole Labus	2/8/2011 10:46:47 AM
10	005	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:13:50 AM
10	006	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/8/2011 11:29:18 AM
10	006	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/8/2011 11:29:33 AM
10	002	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/8/2011 6:19:37 PM
10	008	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/8/2011 6:19:49 PM
11	004	6010	Metals	In	Nicole Labus	2/8/2011 10:44:00 AM
11	004	6010	Metals	Out	Gerson Galvis	2/8/2011 1:03:05 PM
11	004	6010	Metals	In	Gerson Galvis	2/8/2011 1:24:22 PM
11	005	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/8/2011 9:00:23 AM
11	005	7196A	Hex Chrom	In	Nicole Labus	2/8/2011 11:31:11 AM
11	005	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/8/2011 2:00:54 PM
11	004	7470	Mercury	In	Nicole Labus	2/8/2011 10:44:01 AM
11	004	7470	Mercury	Out	Gerson Galvis	2/9/2011 11:43:38 AM
11	004	7470	Mercury	In	Gerson Galvis	2/9/2011 1:20:53 PM
11	001	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:18 PM
11	002	8081	Pesticides	In	Russell Stallone	2/8/2011 6:19:23 PM
11	002	8081	Pesticides	Consumed	Devon Thompson	2/9/2011 8:26:41 AM

Addendum

Letter of Acceptance

Customer Name: CH2M Hill

Date and Time Received: 2/8/2011 8:30:00 AM

Date to be Reported: 3/2/2011

Laboratory Submission Number/SDG: 3501997

Get Detailed Analyte List here: www.pelab.com/webdms/Default.asp?LoaSDG=3501997

Project: Vieques/SWMU 6/402244.FI.SW.06. CTO111

Samples: The submission consisted of 11 samples, including QC, with sample identification shown in the attached data tables.

Tests: The Samples will be analyzed for EPA methods: 6010, 6010_D, 6020_D_OL, 6020OL, 7196A, 7196A_D, 7470, 7470_D, 8081, 8082L, 8260, 8270_SIM.

Sample Custody/COC discrepancies:

None.

Notes:

Sample ID VWW06-SW002-0211 was received with 2 vials for 8260 analysis broken in transit, extra received. Samples for 6020 analysis will be performed by Mitkem.

Distribution of Report to:

CH2M Hill
Attn: Michael Zamboni
(W): 703.376.5301

Note: Submitted material will be retained for 30 days unless otherwise requested by client or consumed in analysis. PEL letters and reports are for the exclusive use of the client to whom they are addressed. Our letters and reports apply to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar materials

1

Log-in Report

Level: 4

Total of: 96 analyses on 17 samples (including QC) *10-Feb-11*

Report/SDG #: 3501997

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW014-0211	350199701		W	2/7/2011 9:10:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW015-0211	350199702		W	2/7/2011 8:50:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081

Report/SDG #: 3501997

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW016-0211	350199703		W	2/7/2011 8:05:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW016-0211MS	350199704		W	2/7/2011 8:05:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081

Report/SDG #: 3501997

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW016-0211SD	350199705		W	2/7/2011 8:05:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW017-0211	350199706		W	2/7/2011 7:45:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-TB01-020711	350199707		W	2/7/2011 6:00:00 AM	2/8/2011 8:30:00 AM

Method		
8260	Volatile Organic Compounds	8260

Report/SDG #: 3501997

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-EB01-020711	350199708		W	2/7/2011 6:10:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW001-0211	350199709		W	2/7/2011 10:20:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

Report/SDG #: 3501997

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW002-0211	350199710		W	2/7/2011 9:45:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-EB02-020711	350199711		W	2/7/2011 11:20:00 AM	2/8/2011 8:30:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7470	Mercury	7470
8081	Pesticides	8081

John Heyman [PEL]

From: Vickie.Weber@ch2m.com
Sent: Wednesday, February 09, 2011 5:17 PM
To: John Heyman [PEL]; Michael.Zamboni@CH2M.com
Subject: Vieques SWMU 6 corrections memo
Attachments: CTF_020911_vw.pdf

Hello John,

Please look at the attached corrections memo for updates to the COCs for the samples from Vieques SWMU 6.

Let me know if you have any questions.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 07, 2011 3:23 PM
To: Brynildsen, Victoria/VBO; Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Good to go.
Thanks!
John

From: Vickie.Weber@ch2m.com [mailto:Vickie.Weber@ch2m.com]
Sent: Monday, February 07, 2011 3:22 PM
To: Michael.Zamboni@CH2M.com; John Heyman [PEL]
Subject: RE: LOA and COC for Vieques SWMU 6

Ok...

Sorry about the confusion. The water samples are from 2/3/11 and the field team just wanted me to note that the filtered metals were field filtered as they forgot to include a note about that on the COC.

Let me know if you still have questions.

Vickie

From: Zamboni, Michael/WDC
Sent: Monday, February 07, 2011 3:05 PM
To: Brynildsen, Victoria/VBO; John Heyman [PEL]
Cc: Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Hi Vickie,

Can you please clarify this email? On 2/4/11, there should only be one aqueous sample (besides the trip blank) and it is an equipment blank which should not have been field-filtered for metals.

There were a bunch of aqueous (surface water) samples collected 2/3/11 and they were submitted for both total metals and filtered metals. Those filtered metals were field-filtered.

Thanks,
Mike Z.

From: Brynildsen, Victoria/VBO
Sent: Monday, February 07, 2011 1:55 PM
To: John Heyman [PEL]; Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Hello John,

For Vieques SWMU 6 CTO-111, the Aqueous samples collected on 2/4/11 were field filtered for Metals.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Thursday, February 03, 2011 12:40 PM
To: Zamboni, Michael/WDC
Cc: Brynildsen, Victoria/VBO
Subject: RE: LOA and COC for Vieques SWMU 6

Will do.
Thanks!
John

From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Thursday, February 03, 2011 12:35 PM
To: John Heyman [PEL]
Cc: Victoria.Brynildsen@CH2M.com; Michael.Zamboni@CH2M.com
Subject: RE: LOA and COC for Vieques SWMU 6

Would you please include Vicki on the logins? Files reattached.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Thursday, February 03, 2011 12:33 PM
To: Zamboni, Michael/WDC
Subject: LOA and COC for Vieques SWMU 6

Good afternoon.

3501958

Let me know if anyone else should be on the LOA distribution.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

Corrections to COCs

TO: John Heyman
PEL

COPIES: File
EDD
Data Package

FROM: Victoria Weber
Environmental Information Specialist
CH2M HILL

DATE: February 9, 2011

This memo is to document corrections made to entries on the Chains of Custody (COC) for Vieques SWMU 6, CTO-111.

The following Sample IDs need to be updated.

Correct Sample ID	Incorrect Sample ID	Date	Time
VWW06-EB01-020411	VWAE-EB01-020411	2/4/2011	6:30
VWW06-TB01-020411	VWAE-TB01-020411	2/4/2011	6:45
VWW06-SD001-0211	VWW06-SD01-0211	2/8/2011	11:25
VWW06-SD002-0211	VWW06-SD02-0211	2/8/2011	11:10
VWW06-EB01-020811	VWAE-EB01-020811	2/8/2011	6:00
VWW06-EB02-020811	VWAE-EB02-020811	2/8/2011	6:20
VWW06-TB01-020811	VWAE-TB01-020811	2/8/2011	12:00
VWW06-TB01-020711	VWAE-TB01-020711	2/7/2011	6:00
VWW06-EB01-020711	VWAE-EB01-020711	2/7/2011	6:10
VWW06-EB02-020711	VWAE-EB02-020711	2/7/2011	11:20
VWW06-EB01-020311	VWAE-EB01-020311	2/3/2011	6:30
VWW06-TB04-020311	VWAE-TB04-020311	2/3/2011	11:30

COPYRIGHT 2011 BY CH2M HILL, INC. • COMPANY CONFIDENTIAL

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:11 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501997 / Vieques / 7470

Good afternoon.

Please note the following that will appear in the case narrative for method 7470 on SDG 3501997.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350199703A was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 58.3 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
   MS - VWW06-SW016-0211MS was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 60 % with criteria of (80-120).

   SD - VWW06-SW016-0211SD was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 57.7 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

   Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 16, 2011 4:48 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501997 / Vieques / 6010

Good afternoon.

Please note the following that will appear in the case narrative for method 6010 on SDG 3501997.

1. **Calibration Blanks:**

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB960936 was analyzed on 03/14/11 10:46. The following analyte(s) were detected below RL: Aluminum at 11.6 UG/L, Barium at 0.377 UG/L, Beryllium at 0.25 UG/L, Iron at 23.5 UG/L, Magnesium at 12.6 UG/L, Manganese at -0.437 UG/L, Potassium at 82.6 UG/L.
CCB960892 was analyzed on 03/14/11 11:56. The following analyte(s) were detected below RL: Beryllium at 0.122 UG/L, Iron at 9.3 UG/L, Manganese at -0.644 UG/L.
CCB960904 was analyzed on 03/14/11 13:01. The following analyte(s) were detected below RL: Beryllium at 0.129 UG/L, Iron at 11.6 UG/L, Manganese at -0.629 UG/L, Thallium at -5.54 UG/L.
CCB960905 was analyzed on 03/14/11 13:04. The following analyte(s) were detected below RL: Manganese at -0.707 UG/L.
CCB960942 was analyzed on 03/14/11 14:01. The following analyte(s) were detected below RL: Iron at 9.74 UG/L, Manganese at -0.77 UG/L, Sodium at 194 UG/L, Thallium at -4.42 UG/L.
CCB961057 was analyzed on 03/14/11 16:03. The following analyte(s) were detected below RL: Barium at 0.261 UG/L, Beryllium at 0.158 UG/L, Iron at 11.6 UG/L, Manganese at -0.59 UG/L, Thallium at -5.21 UG/L.
CCB961058 was analyzed on 03/14/11 16:07. The following analyte(s) were detected below RL: Iron at 9.28 UG/L, Manganese at -0.62 UG/L, Thallium at -4.58 UG/L.
CCB961070 was analyzed on 03/14/11 17:06. The following analyte(s) were detected below RL: Barium at 0.23 UG/L, Iron at 9.05 UG/L, Magnesium at 9.82 UG/L, Manganese at -0.635 UG/L, Sodium at 266 UG/L.
CCB961071 was analyzed on 03/14/11 17:09. The following analyte(s) were detected below RL: Manganese at -0.675 UG/L, Sodium at 226 UG/L.
CCB961083 was analyzed on 03/14/11 18:08. The following analyte(s) were detected below RL: Barium at 0.272 UG/L, Iron at 6.96 UG/L, Manganese at -0.665 UG/L, Thallium at -6.62 UG/L.
The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Method Blanks:**

All acceptance criteria were met with the exception of:
Blank 70594MB was analyzed with the water samples on 03/14/11. The following analyte(s) were detected below RL: Barium at 0.265 UG/L, Calcium at 63.8 UG/L, Magnesium at 12.2 UG/L, Sodium at 187 UG/L. The hits in the blank are below the RL, therefore, no corrective action was taken.
Samples coded accordingly.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

SD - VWW06-SW016-0211SD (at a 10X dilution) was analyzed with the water samples on

03/14/11. The following analyte(s) were recovered below criteria: Magnesium at 20 % with criteria of (80-120). The most probable cause for Magnesium exceeding limits for the MSD is sample matrix due to the sample requiring a 10X dilution for being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly

B. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350199703L was analyzed with the water samples on 03/14/11. The following analyte(s) exceeded criteria: Barium at 14 % with criteria of (10). The most probable cause for Barium exceeding limits for the SD is sample matrix due to the sample requiring a 10X dilution for being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

C. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW001-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW001-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW002-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW002-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW014-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW014-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW015-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.
Sample VWW06-SW015-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW016-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW016-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW017-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW017-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 16, 2011 4:49 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501997 / Vieques / 7470_D

Good afternoon.

Please note the following that will appear in the case narrative for method 7470D on SDG 3501997.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350199703A was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 55.5 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met.
   MS - VWW06-SW016-0211MS was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 57.4 % with criteria of (80-120).

   SD - VWW06-SW016-0211SD was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 57.4 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.
   Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 16, 2011 4:49 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501997 / Vieques / 7470

Good afternoon.

Please note the following that will appear in the case narrative for method 7470 on SDG 3501997.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350199703A was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 58.3 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   A client requested MS/SD set was analyzed.

   All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
   MS - VWW06-SW016-0211MS was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 60 % with criteria of (80-120).

   SD - VWW06-SW016-0211SD was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 57.7 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.
   Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material.

In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Thursday, March 17, 2011 9:15 AM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3501997 / Vieques / 6010_D

Good morning.

Please note the following that will appear in the case narrative for method 6010_D on SDG 3501997.

1. **Calibration Blanks:**
All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Aluminum at 21.3 UG/L, Barium at 0.347 UG/L, Beryllium at 0.328 UG/L, Iron at 31.2 UG/L, Magnesium at 19.2 UG/L, Manganese at -0.401 UG/L, Potassium at 98.8 UG/L, Thallium at 4.68 UG/L.
CCB961465 was analyzed on 03/15/11 15:46. The following analyte(s) were detected below RL: Manganese at -0.769 UG/L, Nickel at -2.12 UG/L, Vanadium at 0.526 UG/L.
CCB961477 was analyzed on 03/15/11 17:06. The following analyte(s) were detected below RL: Manganese at -0.806 UG/L, Nickel at -1.72 UG/L.
CCB961490 was analyzed on 03/15/11 18:31. The following analyte(s) were detected below RL: Manganese at -0.74 UG/L, Nickel at -2.24 UG/L.
CCB961502 was analyzed on 03/15/11 19:54. The following analyte(s) were detected below RL: Iron at 9.23 UG/L, Manganese at -0.752 UG/L, Nickel at -1.44 UG/L, Vanadium at 0.451 UG/L.

ICB961756 was analyzed on 03/16/11 07:38. The following analyte(s) were detected below RL: Aluminum at 12.7 UG/L, Barium at 0.238 UG/L, Beryllium at 0.258 UG/L, Iron at 24.8 UG/L, Magnesium at 15.4 UG/L, Manganese at -0.684 UG/L.
CCB961769 was analyzed on 03/16/11 11:27. The following analyte(s) were detected below RL: Manganese at -0.954 UG/L, Nickel at -0.931 UG/L.
CCB961780 was analyzed on 03/16/11 13:14. The following analyte(s) were detected below RL: Manganese at -0.931 UG/L, Thallium at 5.06 UG/L.
CCB961781 was analyzed on 03/16/11 13:17. The following analyte(s) were detected below RL: Manganese at -0.906 UG/L, Nickel at -1.17 UG/L.
CCB961793 was analyzed on 03/16/11 14:40. The following analyte(s) were detected below RL: Manganese at -0.881 UG/L, Thallium at 4.42 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Post Digestion Spike:**

All acceptance criteria were met with the exception of:
Post Digestion Spike 350199703ADL1(at a 100X dilution) was analyzed with the water samples on 03/16/11. The following analyte(s) were recovered below criteria: Sodium at 57.2 % with criteria of (80-120). The most probable cause for Sodium exceeding limits is sample matrix due to the sample requiring a 100X dilution for Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

MS - VWW06-SW016-0211MS(at a 10X dilution) was analyzed with the water samples on

03/15/11. The following analyte(s) were recovered below criteria: Calcium at 76 % with criteria of (80-120), Magnesium at 40 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Selenium at 124 % with criteria of (80-120).

SD - VWW06-SW016-0211SD(at a 10X dilution) was analyzed with the water samples on 03/15/11. The following analyte(s) were recovered below criteria: Magnesium at 60 % with criteria of (75-125) and the following analyte(s) were recovered above criteria: Selenium at 130.4 % with criteria of
(75-125). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the sample requiring a 10X dilution due to being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

B. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350199703L(at a 50Xdilution) was analyzed with the water samples on 03/15/11. The following analyte(s) exceeded criteria: Barium at 14 % with criteria of (10). The most probable cause for the SDexceeding limits is sample matrix due to the sample requiring a 50X dilution due to being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

C. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW001-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW001-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW002-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW002-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW014-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW014-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW015-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.
Sample VWW06-SW015-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW016-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW016-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW017-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW017-0211 required a 100X dilution due to high concentration of the following analyte (s): Sodium.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

PEL, a Division of Spectrum Analytical, Inc.
8405 Benjamin Rd., Suite A
Tampa, FL 33634
(P) 813-888-9507 (F) 813-889-7128

CHAIN-OF-CUSTODY RECORD

Tuesday, February 08, 2011 1:17:00 PM

WorkOrder: 3501997

Send to:
Mitkem
175 Metro Center Blvd.
Warwick, RI 02886
Phone: 401-732-3400 FAX:

Project: Vieques
Project Name Vieques/SWMU 6/402244.FI.SW.06. CTO111

Report To: John Heyman, Ext 2
Report Level: 4
Report RLU or MDLU: RL U
J Code results between MDL and RL

	Sample ID	LabID	Collection Date	Date Needed	Mtx	Cont	Requested Tests: 6020.D	6020								Comments
1	VWW06-SW014-0211	350199701	2/7/2011 9:10:00 AM	2/21/2011	W	1	X	X								foreign samples
2	VWW06-SW015-0211	350199702	2/7/2011 8:50:00 AM	2/21/2011	W	1	X	X								
3	VWW06-SW016-0211	350199703	2/7/2011 8:05:00 AM	2/21/2011	W	1	X	X								
3	VWW06-SW016-0211MS	350199704	2/7/2011 8:05:00 AM	2/21/2011	W	1	X	X								
3	VWW06-SW016-0211SD	350199705	2/7/2011 8:05:00 AM	2/21/2011	W	1	X	X								
4	VWW06-SW017-0211	350199706	2/7/2011 7:45:00 AM	2/21/2011	W	1	X	X								
5	VWAE-EB01-020711	350199708	2/7/2011 6:10:00 AM	2/21/2011	W	1	X	X								
6	VWW06-SW001-0211	350199709	2/7/2011 10:20:00 AM	2/21/2011	W	1	X	X								
7	VWW06-SW002-0211	350199710	2/7/2011 9:45:00 AM	2/21/2011	W	1	X	X								
8	VWAE-EB02-020711	350199711	2/7/2011 11:20:00 AM	2/21/2011	W	1		X								

3501997

Comments: DD

		Date/Time			Date/Time
Relinquished by:		2-8-11 1720	Received by:	SW	2/9/11 8:45
Relinquished by:			Received by:		~~2/8/2011 1:17:00 PM~~ SW 2/9/11
Relinquished by:			Received by:		

4.5 °C

128

438

MITKEM LABORATORIES
Sample Condition Form

Received By: SV | Reviewed By: PS | Date: 2/9/11 | Mitkem Work Order #: K0205

Client Project: Vieques | Client: PEL

1) Cooler Sealed — Yes / No

2) Custody Seal(s) — Present / Absent; Coolers / Bottles; Intact / Broken

3) Custody Seal Number(s) — NA

4) Chain-of-Custody — Present / Absent

5) Cooler Temperature — 4.5°C

IR Temp Gun ID — MT-1

Coolant Condition — ice

6) Airbill(s) — Present / Absent

Airbill Number(s) — FedEx
4640077 0727
4640077 0738

7) Samples Bottles — Intact / Broken / Leaking

8) Date Received — 2/9/11

9) Time Received — 8:45

Preservative Name/Lot No.:

Lab Sample ID		Preservation (pH) HNO_3	H_2SO_4	HCl	NaOH	H_3PO_4	VOA Matrix	Soil Headspace or Air Bubble ≥ 1/4"
K0205	01	<2						
	02							
	03							
	04							
	05							
	06							
	07							
K0205	08	<2						

VOA Matrix Key:

US = Unpreserved Soil	A = Air
UA = Unpreserved Aqueous	H = HCl
M = MeOH	E = Encore
N = NaHSO4	F = Freeze

See Sample Condition Notification/Corrective Action Form yes / no

Form ID: QAF.0006

Rad OK yes / no

\\Bernoulli\qa_safety\Controlled Forms\QAF.0006 sample condition form

Shirley Ng [Mitkem]

From: John Heyman [PEL]
Sent: Monday, February 14, 2011 12:04 PM
To: Shirley Ng [Mitkem]
Subject: RE: Vieques sample ID changes

Sorry about that.

3501997 – PEL ID -08 should be VWW06-EB01-020711 - K0205 - 07
3501997 – PEL ID -11 should be VWW06-EB02-020711 K0205 - 08

John

From: Shirley Ng [Mitkem]
Sent: Monday, February 14, 2011 12:01 PM
To: John Heyman [PEL]
Subject: RE: Vieques sample ID changes

Wait a minute, there are 2 EBs in 3501997. And you were referring to 3501977. Please double check and let me know.

Shirley

From: John Heyman [PEL]
Sent: Monday, February 14, 2011 9:16 AM
To: Shirley Ng [Mitkem]
Subject: RE: Vieques sample ID changes

Yes. I thought that we caught that one before it went out.

3501977 – PEL ID -09 should be VWW06-EB01-020311

Thanks!
John

From: Shirley Ng [Mitkem]
Sent: Monday, February 14, 2011 8:12 AM
To: John Heyman [PEL]
Subject: RE: Vieques sample ID changes

John,
Any changes with 3501997 ? The EB is called VWAE-EB01-020711, please confirm if this is correct.
Thanks
Shirley

From: John Heyman [PEL]
Sent: Friday, February 11, 2011 5:11 PM
To: Shirley Ng [Mitkem]; Edward Lawler [Mitkem]
Subject: Vieques sample ID changes

Shirley:
Good afternoon.

Client has a couple of sample ID changes for Vieques samples that we had already sent up to you.

3501993 – PEL ID -14 should be VWW06-EB01-020411
3501977 – PEL ID -09 should be VWW06-EB02-020311

Prefix was VWAE on the OL COCs and PEDD that we had sent to you.

Let me know if you have any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

YES NO N/A

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3501997 LAB: PEL

SITE NAME: SWMU 6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? ☑ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. VOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? ☑ ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? ☑ ___ ___

1.3 Sample Conditions/Problems

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ ✓ ___

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R".

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ".

Sampled 2/1 Analy 2/14
Recd 2/8 Temp 1.6-4.6°C

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? ___ ✓ ___

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	> 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	> 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	> 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water ☑ ___ ___

b. Soil ☐ ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water ☑ ___ ___

b. Soil ☐ ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, section 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. lab ☑ ___ ___

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? [ ] ___ ✓

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2. [ ] ✓ ___

If yes, were samples reanalyzed? [ ] ___ ✓

Were method blanks reanalyzed? [ ] ___ ✓

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] ✓ ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Sample(Form III/Equivalent)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. ✓ ___ ___

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

A. Water [✓] ___ ___

B. Soil [ ] ___ ___

C. Med Soil [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ [✓]

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits. [ ] [✓] ___

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	**Non-Detected Spiked Compounds**
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

5.0 Matrix Spikes(Form III or equivalent)

no MS/MSD

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [ ] ___ ___ ✓

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? [ ] ___ ___ ✓

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

a. Water [ ] ___ ✓

b. Waste [ ] ___ ✓

c. Soil/Solid [ ] ___ ✓

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7)for each matrix. [ ] ___ ✓

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [ ] ___ ✓

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD results in conjunction with other QC criteria to determine the need for some qualification.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as well as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determine that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

YES NO N/A

6.0 Blank (CLP Form IV Equivalent)

6.1 Is the Method Blank Summary form present? ✓ ___ ___

6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ✓ ___ ___

6.3 Has a method blank been analyzed for each GC/MS system used ? ✓ ___ ___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject ® all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds? ✓ ___ ___

7.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are <u>not</u> used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. ✓ ___ ___

YES NO N/A

7.2 Do any field/rinse blanks have positive volatile organic compound results? ✓ [ ] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

VOLATILE ORGANIC METHOD BLANK SUMMARY

EPA Sample No.: 021411BLKA32

Lab Name: PEL, Spectrum Analytic Contract: Vieques/SWMU 6/402244.FI.SW.06.

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Lab File ID: BLK32.D Lab Sample ID: 021411BLKA32

Instrument ID: VMS03 Date Extracted:

Matrix: WATER Date Analyzed: 02/14/11

Level:(low/med) LOW Time Analyzed: 0925

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1	021411LCSA31D	021411LCSA31D	LCS31D.D	02/14/11	0723
2	021411LCSA31	021411LCSA31	LCS31R.D	02/14/11	0747
3	VWW06-TB01-020711	350199707	99707.D	02/14/11	1339
4	VWW06-EB01-020711	350199708	99708.D	02/14/11	1402
5	VWW06-SW001-0211	350199709	99709.D	02/14/11	1426
6	VWW06-SW002-0211	350199710	99710.D	02/14/11	1449

Acetone 3.7J ug/L (2.6)
1,2,4-trichlorobenzene 0.13J (0.22)

COMMENTS:

Page 1 of 1

Additional Region II Worksheet listing blank qualifications due to method and/or QC Blank Contamination

SDG# 3501997

VOA

The associated method and/or QC blanks exhibited contamination as noted in the following table.

Blank ID	Compound	Concentration	Reporting Limit (LOD)
021411BLK32	acetone	3.7 ug/L	2.6 ug/L
	1,2,4-trichlorobenzene	0.13J	0.22
VWW06-TB01-021011	methylene chloride	1J	1.3
	acetone	3.9J	2.6
VWW06-EB01-021011	acetone	6.9J	2.6
	chloroform	0.44J	0.32

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code
VWW06-SW001-0211, VWW06-SW002-0211	acetone	U at LOD	MBL

YES NO N/A

7.3 Are there field/rinse/equipment blanks associated with every sample? ☑ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. ☑ ___ ___

NOTE: For the analysis of volatiles, the method requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? ☑ ___ ___

9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? ☑ ___ ___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? ✓ ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ ✓ ___

9.7 Have the appropriate number of significant figures (two) been reported? ✓ ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. ✓ ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

YES NO N/A

10.0 Target Analytes (CLP Form I Equivalent)

10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate [✓] ___ ___

b. Matrix spikes and matrix spike duplicates [ ] ___ [✓]

c. Blanks [✓] ___ ___

d. Laboratory Control Samples [✓] ___ ___

10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate [✓] ___ ___

b. Matrix spikes and matrix spike duplicates (Mass spectra not required) [ ] ___ [✓]

c. Blanks [✓] ___ ___

d. Laboratory Control Samples [✓] ___ ___

ACTION: If any data are missing, take action specified in 3.2 above.

10.3 Is chromatographic performance acceptable with respect to:

Baseline stability? [✓] ___ ___

	YES	NO	N/A
Resolution?	☑		
Peak shape?	☑		
Full-scale graph (attenuation)?	☑		

Other:_____

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? ☑

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab for missing spectra.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? ☑

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? ☑

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? ☑

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

no TICs

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ✓

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ✓

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ✓ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? ☑ ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC accedence dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? ☑ ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? ☑ ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39)qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? ☑ ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. ☑ ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] ___ ✓ ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 GC/MS Calibration Verification (CLP Form VII Equivalent)

YES NO N/A

15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest? [Y] ___ ___

15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [Y] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF? [Y] ___ ___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2). [Y] ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? [V] ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? [V] ___ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit

(Attach additional sheets if necessary.)

ACTION: 1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

2. Do not qualify non-detects when the associated IS are counts area > + 100%.

3. If the IS area is below the lower limit (< -50%), qualify all associated non-detects (U-values) "J".

4. If extremely low area counts are reported (< -25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? ✓ ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? [ ] ✓ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

Initial Calibration Date: 2/8/2011

RRF and %RSD Calculations:

Compound Name: vinyl chloride
Lab Value: 0.386

Area of Compound	788859
Area of Internal STD	1277822
Conc. of Internal STD	50
Conc. of Compound	80
Calculated RRF	0.386

Compound Name: ethylbenzene
Lab Value: 10.50

RRF of STD 1	0.470
RRF of STD 2	0.606
RRF of STD 3	0.533
RRF of STD 4	0.477
RRF of STD 5	0.429
RRF of STD 6	0.548
RRF of STD 7	0.539
RRF of STD 8	0.544
RRF of STD 9	0.570
Calculated % RSD	10.51

Continuing Calibration File ID: 2/14/2011

RRF and %D Calculations:

Compound Name: 4-methy-2-pentanone
Lab Value: 0.087

Area of Compound	195956
Area of Internal STD	1128191
Conc. of Internal STD	50
Conc. of Compound	100
Calculated RRF	0.087

Compound Name: ethylbenzene
Lab Value: 0.7

Average RRF	0.524
Calibration Check RRF	0.528
Calculated % D	-0.7

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA 8260B/SW846

IV. PREPARATION

Water samples were prepared by SW846/5030 for EPA8260B volatiles analysis. All aspects of sample preparation proceeded without exception.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met. Please note that:

Blank 021411BLKA32 was analyzed with the water samples on 02/14/11. The following analyte(s) were detected below RL: 1,2,4-Trichlorobenzene at 0.13 UG/L, Acetone at 3.7 UG/L.

No further action was necessary, since the detected hits are below the RL. Samples coded accordingly.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed. All percent recovery and relative percent difference (RPD) criteria were met.

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Lisa Pelo Title: VOA Manager

SIGNED: **DATE:** 03/02/2011

YES NO N/A

E - The concentration of this analyte exceeds the calibration range of the instrument.

A - Indicates a Tentatively Identified Compound (TIC) is a suspected adol-condensation product.

X,Y,Z- Laboratory defined flags. The data reviewer must change these qualifiers during validation so that the data user may understand their impact on the data.

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3501997 LAB: PEL

SITE NAME: SWMU 6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the data assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? ☑ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ☑ ___ ___

YES NO N/A

II. SEMIVOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? ✓ ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ ✓ ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, all non-detects data are qualified as unusable (R), and detects are flagged "J".

ACTION: If samples were not iced, or if the ice was melted upon arrival at the laboratory and the cooler temperature was elevated (10°C), flag all positive results "J" and all non-detects "UJ".

Temp 1.6-4.6 °C

Sampled 2/7 Extr 2/8
Recd 2/8 Analy 2/9

2.0 Holding Times

2.1 Have any semivolatile technical holding times, determined from date of collection to date of extraction, been exceeded? ___ ✓ ___

Continuous extraction of water samples for semivolatile analysis must be started within **7** days of the date of collection. Soil/sediment samples must be extracted within **14** days of collection. Extracts must be analyzed within

YES NO N/A

40 days of the date of extraction.

Table of Holding Time Violations

(See Traffic Report)

Sample ID	Sample Matrix	Date Sampled	Date Lab Received	Date Extracted	Date Analyzed

ACTION: If technical holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

	YES	NO	N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Have the semi volatile surrogate recoveries been listed on CLP Surrogate Recovery forms (Form II) for each of the following matrices:

a. Low Water	✓		
b. Low/Med Soil			

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery Summary forms for each matrix:

a. Low Water	✓		
b. Low/Med Soil			

ACTION: If CLP deliverables are unavailable, document the effect(s) in data assessments. In some cases the lab may have to be contacted to obtain the data necessary to complete the validation.

3.3 Were outliers marked correctly with an asterisk?			✓

ACTION: Circle all outliers in red.

3.4 Were two or more base neutral OR acid surrogate recoveries out of specification for any sample or method blank (Reviewer should use lab in house recovery limits. Use surrogate recovery limits from USEPA National Functional Guidlines January 2005 page 130, if in house limits are not available. See Method 8000B-43 or 80000C-24).		✓	

Note: Examine lab in house limits for reasonableness.

If yes, were samples re-analyzed?			✓

	YES	NO	N/A
Were method blanks re-analyzed?	[ ]	___	✓

ACTION: If all surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet method specifications, <u>for the affected fraction only (i.e. either base-neutral or acid compounds):</u>

1. Flag all positive results as estimated ("J").

2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.

3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any base-neutral <u>or</u> acid surrogate has a recovery of < 10%:

1. Positive results for the fraction with < 10% surrogate recovery are qualified with "J".

2. Non-detects for that fraction should be qualified as unusable (R) .

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

3.5 Are there any transcription/calculation errors between raw data and Form II?	___	✓ [ ]	___

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and document

YES NO N/A

effect in data assessments.

4.0 Matrix Spikes (Form III/Equivalent)

NO MS/MSD

4.1 Have the semivolatile Matrix Spike and Matrix Spike Duplicate/or duplicate unspiked Sample recoveries been listed on the Recovery Form (Form III)? [ ] ___ ✓

NOTE: Method 3500B/page 4 states the spiking compounds:

Base/neutrals	Acids
1,2,4-Trichlorobenzene	Pentachlorophenol
Acenaphthene	Phenol
2,4-Dinitrotoluene	2-Chlorophenol
Pyrene	4-Chloro-3-methylphenol
N-Nitroso-di-n-propylamine	4-Nitrophenol
1,4-Dichlorobenzene	

Note: Some projects may require the spiking of specific compounds of interest.

Note: See Method 8270D-sec 8.4.2 for deciding on whether to prepare and analyze duplicate samples or a martix spike/matrix spike duplicate. If samples are expected to contain target analytes, then laboratory may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, laboratory should use a matrix spike and matrix spike duplicate pair.

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [ ] ___ ✓

b. Low Solid [ ] ___ ✓

c. Med Solid [ ] ___ ✓

YES NO N/A

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above. It may be necessary to contact the lab to obtain the required data.

NOTE: If the data has not been reported on CLP equivalent form, then the laboratory must provide the information necessary to evaluate the spike recoveries in the MS and MSD. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

4.3 Were matrix spikes performed at concentration equal to 100ug/L for acid compounds, and 200ug/l for base compounds (Method 3500B-4), or those specified in project plan. [ ] ___ ___

4.4 How many semivolatile spike recoveries are outside Laboratory in house MS/MSD recovery limits (use recovery limits values in Method 8270D-43&44 Table 6 if in house values not available).

Water

____ out of ____

Solids

____ out of ____

YES NO N/A

4.5 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Solids
____ out of ____	____ out of ____

ACTION: Circle all outliers with red pencil.

ACTION: No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the matrix spike and matrix spike duplicate results in conjunction with other QC criteria to determine the need for some qualification of the data.

4.6 Was a Laboratory Control Sample (LCS) analyzed with each analytical batch? ☑ ___ ___

NOTE: When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

5.0 Blanks (Form IV/Equivalent)

5.1 Is the Method Blank Summary (Form IV) present? ☑ ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported per 20 samples of similar matrix, or concentration level, and for each extraction batch? ☑ ___ ___

5.3 Has a method blank been analyzed either after

YES NO N/A

the calibration standard or at any other time during the analytical shift for each GC/MS system used ? ✓ ___ ___

ACTION: If any method blank data are missing, call lab for explanation/resubmittal. If not available, use professional judgement to determine if the associated sample data should be qualified.

5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra.

Is the chromatographic performance (baseline stability) for each instrument acceptable for the semivolatiles? ✓ ___ ___

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. ___ ✓ ___

6.2 Do any field/rinse/ blanks have positive results for target analytes and/or TICs (if required, see section 10 below)? ___ ✓ ___

YES NO N/A

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks. If gross contamination exists, all data in the associated samples should be qualified as unusable (R).

VWW06-EB01-020711 MO+

YES NO N/A

Blank Action for Semivolatile Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification required
	< CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	= CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report concentration of sample with a U
		≥ CRQL and ≥ blank contamination	No qualification required

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: If the laboratory did not report TIC analyses, check the project plans to verify whether or not it was required.

6.3 Are there field/rinse/equipment blanks associated with every sample? ☑ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

6.4 Was a instrument blank analyzed after each sample/dilution which contained a target compound

	YES	NO	N/A
that exceeded the initial calibration range.	[ ]	___	✓
6.5 Does the instrument blank have positive results for target analytes and/or TICs?	___	[ ]	✓

Note: Use professional judgement to determine if carryover occurred and qualify analytes accordingly.

7.0 GC/MS Apparatus and Materials

7.1 Did the lab use the proper gas chromatographic column for analysis of semivolatiles by Method 8270D? Check raw data, instrument logs or contact the lab to determine what type of column was used. The method requires the use of 30 m x 0.25 mm ID (or 0.32 mm ID), silicone-coated, fused silica, capillary column.	[✓]	___	___

ACTION: If the specified column, or equivalent, was not used, document the effects in the data assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (Form V/Equivalent)

8.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for decafluorotriphenylphosphine (DFTPP)?	[✓]	___	___

NOTE: The performance solution should also contain 4,4-DDT, pentachlorophenol, and benzidine to verify injection port inertness and column performance. The degradation of DDT to DDE and DDD must be less than 20% total and the response of pentachlorophenol and benzidine should be within normal ranges for these compounds (based upon lab experience) and show no peak degradation or tailing before samples are analyzed. (see section 5.5

	YES	NO	N/A

page 8270D-12).

8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? ☑ ___ ___

8.3 Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument? ☑ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable (R).

8.4 Have the ion abundances been normalized to m/z 198? ☑ ___ ___

8.5 Have the ion abundance criteria been met for each instrument used? ☑ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

	YES	NO	N/A
ACTION: If ion abundance criteria are not met, take action specified in section 3.2			
8.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.)		✓	
8.7 Have the appropriate number of significant figures (two) been reported?	✓		
ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document effect in data assessments.			
8.8 Are the spectra of the mass calibration compound acceptable?	✓		
ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			

9.0 Target Analytes

	YES	NO	N/A
9.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates			✓
c. Blanks	✓		
9.2 Has any special cleanup, such as GPC, been performed on all soil/sediment sample extracts (see section 7.2, page 8270D-14)?			✓

	YES	NO	N/A

ACTION: If data suggests that extract cleanup was not performed, use professional judgement. Make note in the data assessment narrative.

9.3 Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)			✓
c. Blanks	✓		

ACTION: If any data are missing, take action specified in 3.2 above.

9.4 Are the response factors shown in the Quant Report? ✓

9.5 Is chromatographic performance acceptable with respect to:

Baseline stability?	✓		
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		
Other:_____			

ACTION: Use professional judgement to determine the acceptability of the data.

9.6 Are the lab-generated standard mass spectra of identified semivolatile compounds present for

	YES	NO	N/A
each sample?	☑		

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the data assessment narrative. If spectra are missing, reject all positive data.

9.7 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	☑		
9.8 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?	☑		
9.9 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum?	☑		

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R), flagged "N" (Presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 9.7, 9.8, and 9.9.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

	YES	NO	N/A

10.0 Tentatively Identified Compounds (TIC)

No TICs

10.1 If Tentatively Identified Compounds were required for this project, are all Form Is, Part B present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?

NOTE: Review sampling reports to determine if the lab was required to identify non target analytes (refer to section 7.6.2,page 8270D-21).

10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following: [ ] ___ ___ ✓

a. Samples and/or fractions as appropriate [ ] ___ ___ ✓

b. Blanks [ ] ___ ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by CAS #.

10.3 Are any target compounds from one fraction listed as TIC compounds in another (e.g., an acid compound listed as a base neutral TIC)? ___ [ ] ✓

ACTION: i. Flag with "R" any target compound listed as a TIC.

ii. Make sure all rejected compounds are properly reported in the other fraction.

10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the

178

	YES	NO	N/A
sample mass spectrum?	[ ]	___	✓
10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%?	[ ]	___	✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate and remove "JN". Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R."

11.0 Compound Quantitation and Reported Detection Limits

11.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	✓	___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

11.2 Are the method detection limits adjusted to reflect sample dilutions and, for soils, sample moisture?	✓	___	___

YES NO N/A

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original Form I (if present) and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red " X" across the entire page of all Form I's that should not be used, including any in the summary package.

12.0 Standards Data (GC/MS)

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant, Reports) present for initial and continuing calibration? ✓ ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

13.0 GC/MS Initial Calibration (Form VI/Equivalent)

13.1 Is the Initial Calibration Form (Form VI/ Equivalent) present and complete for the semivolatile fraction? ✓ ___ ___

ACTION: If any calibration forms or standard row data are missing, take action specified in 3.2 above.

13.2 Are all base neutral or acid RRFs > 0.050? ✓ ___ ___

180

YES NO N/A

Check the **average RRFs** of the four System Performance Check Compounds (SPCCs): N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and 4-nitrophenol. These compounds must have **average RRFs** greater than or equal to 0.05 before running samples and should not show any peak tailing.

ACTION: Circle all outliers in red.

ACTION: For any target analyte with **average RRF <0.05**

1. "R" all non-detects;

2. "J" all positive results.

13.3 Are response factors for base neutral or acid target analytes stable over the concentration range of the calibration (% Relative standard deviation [%RSD] < 20.0%)? ✓ ___ ___

NOTE: The % RSD for each individual Calibration Check Compound (CCC, Method 8270D-40 see Table 4) must be less than 30% before analysis can begin. If grater 30%, the lab must clean and recalibrate the instrument.

CALIBRATION CHECK COMPOUNDS

Base/Neutral Fraction	Acid Fraction
Acenaphthene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2,4-Dichlorophenol
Hexachlorobutadiene	2-Nitrophenol
Diphenylamine	Phenol
Di-n-octyl phthalate	Pentachlorophenol
Fluoranthene	2,4,6-Trichlorophenol

YES NO N/A

Benzo(a)pyrene

ACTION: If the %RSD for any CCC >30% and no corrective action taken, then "J" qualify all positive hits and "UJ" qualify all non-detects.

ACTION: Circle all outliers in red.

ACTION: If the % RSD is ≥ 20.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, flag all non- detect results for that analyte "R," unusable. Alternatively, the lab should calculate first or second order regression fit of the calibration curve and select the fit which introduces the least amount of error.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

13.4 Did the laboratory calculate the calibration curve by the least squares regression fit? ___ ✓ ___

13.5 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or % RSD? (Check at least two values but if errors are found, check more.) ___ ✓ ___

ACTION: Circle Errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in data assessments.

13.5 Do the target compounds for this SDG include Pesticides? [ ] ___ ✓ ___

	YES	NO	N/A
13.6 If the pesticide compounds include DDT, was the percent breakdown of DDT to DDD and DDE greater than 20%?	___	[ ]	✓

ACTION: If DDT percent breakdown exceeds 20%:

i. Qualify all positive results for DDT with "J". If DDT was not detected, but DDD and DDE results are positive, qualify the quantitation limit for DDT as unusable, "R".

ii. Qualify all positive results for DDD and DDE as presumptively present at an approximate concentration "JN".

14.0 GC/MS Calibration Verification (Form VII/Equivalent)

14.1 Are the Calibration Verification Forms (Form VII) present and complete for all compounds of interest?	[✓]	___	___
14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument?	[✓]	___	___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

_____

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed within twelve hours of every sample analysis,

	YES	NO	N/A
call lab for explanation/resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").			
14.3 Do any of the SPCCs have an RRF <0.05?	___	[✓]	___
If YES, make a note in data assessment if the lab did not take corrective action specified in section 7.4.4, page 8270D-18.	[ ]	✓	___
14.4 Do any of the CCCs have a %D between the initial and continuing RRF which exceeds 20.0%?			
ACTION: If yes, make a note in data assessment.			
14.5 Do any semivolatile compounds have a % Difference (% D) between the initial and continuing RRF which exceeds 20.0%?	___	[✓]	___
ACTION: Circle all outliers in red.			
ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated (J). When %D is above 90%, qualify all non-detects for that analyte as "R", unusable.			
14.6 Do any semivolatile compounds have a RRF < 0.05?	___	[✓]	___
ACTION: Circle all outliers in red.			
ACTION: If RRF < 0.05, qualify as unusable ("R") associated non-detects and "J" associated positive values.			
14.7 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or percent difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more).	___	[✓]	___

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

YES NO N/A

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect(s) in the data assessments.

15.0 Internal Standards (Form VIII)

15.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to + 100%) for each continuing calibration? ✓ ___ ___

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area	LowerLimit	Upper Limit

(Attach additional sheets if necessary.)

Note: Check Table 5, 8270D-41 for associated analytes.

ACTION: i. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard.

ii. Non-detects associated with IS > 100% should not be qualified.

YES NO N/A

iii. If the IS area is below the lower limit (<50%), qualify all associated non-detects (U-values) "J". If extremely low area counts are reported (<25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable (R).

15.2 Are the retention times of all internal standards within 30 seconds of the associated calibration standard? [✓] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Laboratory Control Samples (LCS) no MS

16.1 Were any LCS samples run in order to verify analytes which failed criteria for spike recovery? [ ] ___ [✓]

16.2 Did the lab spike LCS sample spiked with the same analytes and the same concentrations as the matrix spike? [ ] ___ [✓]

16.3 Were the mean and standard deviation of all analytes within the QC acceptance ranges as shown in Table 6, 8270D-43? [✓] ___ ___

ACTION: If the recovery of any analyte falls out of the designated range, the analytical results for that compound is suspect and should be qualified "J" in the unspiked samples.

17.0 Field Duplicates

17.1 Were any field duplicates submitted for semivolatile analysis? [ ] [✓] ___

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8270D.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8270 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

E. Internal Standards:

All acceptance criteria were met.

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:

Name: Brian C. Spaniol **Title:** Lab Director

SIGNED: **DATE:**
03/04/2011

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 35Ø1997
LAB: PEL SITE: Vieques SWMU6

1.0 Data Completeness and Deliverables	YES	NO	N/A
1.1 Has all the data been submitted in CLP deliverable format?	☑		
1.2 Have any missing deliverables been received and added to the data package? Results/corrections received			☑

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter; SDG Narrative	YES	NO	N/A
2.1 Is a laboratory narrative or cover letter present?	☑		
2.2 Are the case number and/or SDG number contained in the narrative or cover letter?	☑		

3.0 Data Validation Checklist	YES	NO	N/A
3.1 Does this data package contain:			
Water data?	☑		
Waste data?			☑
Soil/solid data?			☑

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Tuesday, April 19, 2011 6:07 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs
Attachments: P1598.pdf; P1469.pdf; P4026.pdf; P3933.pdf; P3316.pdf; P2995.pdf; P1385.pdf; P1193.pdf; P2427.pdf; P2727.pdf; P2850.pdf; P1275.pdf; P1518.pdf; P1612.pdf

Jackie:
Good afternoon.
I have attached revised 8081/8082 prep logs. The Clean up used (if any) can be found in the 2nd to the last column on the Extraction Logs.
Please contact me with any questions or concerns.
These pages have been paginated with the SDG number at the bottom of each page for reference.
Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Friday, April 15, 2011 9:52 AM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Hi John,

Please tell me where I would find this information in the prep. logs. I see a list of solvents, etc. at the end of the extraction page but don't know if that indicates that something was done. For example – on the pesticides for SDG 3501993 p 2996 florisil is mentioned with a number. However, the statement below suggests that there was no florisil clean-up performed. I need to be able to see what you have done as Region II questions are very specific on their DV check-lists. If clean-ups are performed, exactly where would they be listed in the logs? Thanks for further clarification!

Jackie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Friday, April 15, 2011 8:14 AM
To: John Heyman [PEL]; Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Jackie:
Per our Lab Manager:

If we perform clean ups then:

Only copper clean ups performed on the 8081. If we perform any clean ups then all the samples and QC would go through the same clean up steps.
PCBs get copper and acid treated, again all QC receive the same treatment.

This should have been noted in the prep logs if performed.

Let me know if you need any additional information.

Thanks!
John

From: Mark Gudnason [PEL] **On Behalf Of** John Heyman [PEL]
Sent: Thursday, April 14, 2011 4:49 PM
To: Jacqueline Cleveland; John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: Question RE- Pesticides & PCBs

Jackie,

John has left for the day but will address this asap tomorrow.

Mark

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, April 14, 2011 4:07 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: FW: Question RE- Pesticides & PCBs
Importance: High

Hi John,

I am just verifying that you received the question noted below! Thank you.

Jackie

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Wednesday, April 13, 2011 8:04 PM
To: 'John Heyman [PEL]'
Cc: 'DataQual Environmental Services, LLC'; 'Michael.Zamboni@CH2M.com'; 'Vickie.Weber@ch2m.com'
Subject: Question RE- Pesticides & PCBs

Good Morning John,

Quick question on the extraction procedures for the Pesticides and PCBs. I need to know what clean-up procedures were used on the sample extracts and whether or not any QC checks were performed to verify the procedures. If there were clean-up checks (for example – florisil cartridge checks) please include results of those checks in your response. Thanks for your help!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

ORGANOCHLORINE PESTICIDE

	YES	NO	N/A
1.0 Traffic Reports and Laboratory Narrative			
1.1 Are traffic report and chain-of-custody forms present for all samples?	[V]		
ACTION: If no, contact lab for replacement of missing or illegible copies.			
1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?		[V]	
ACTION: If any sample analyzed as a soil, other than than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, all non detects are qualified as unusable, "R", and positive results flagged "J".			
ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".			
2.0 Holding Times			
2.1 Have any organochlorine pesticide technical holding times, determined from date of collection to date of extraction, been exceeded?		[V]	

Water and waste samples for organochlorine pesticide analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8081.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8081 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW016-0211MS was analyzed with the water samples extracted on 02/09/11. The following analyte(s) were recovered above criteria: beta-BHC at 134 % with criteria of (65-125).

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

SD - VWW06-SW016-0211SD was analyzed with the water samples extracted on 02/09/11. The following analyte(s) were recovered above criteria: beta-BHC at 135 % with criteria of (65-125).

The most probable cause of exceedances is matrix interference. No further action was taken. Samples coded accordingly.

E. Internal Standards:

This method does not require the use of internal standards.

F. Samples:

Sample analysis proceeded normally.

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:

Name: Brian C. Spanfr **Title:** Lab Director

SIGNED: **DATE:**
03/03/2011

ACTION: Qualify sample results according to Table 1.

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J*	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

YES NO N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [✓] ___ ___

b. Soil/Solid [ ] ___ [✓]

3.2 Are all the pesticide samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ [✓]

c. Soil/Solid [ ] ___ [✓]

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ for all samples, including MS and MSDs, LCSs and all blanks? lab limits used [✓] ___ ___

Note: Reviewer shall use lab in-house recover limits if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate action Table 2.

3.5 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate action, Table 2 below.

YES NO N/A

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample(LCS)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples. [✓] ___ ___

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

YES NO N/A

4.2 Were Laboratory Control Samples analyzed at the required concentration for all analytes of interest as specified in ~~Table 3 below.~~ lab SOP & client SAP [L] ___ ___

Note: Use lab in-house criteria, if available.

Table 3. LCS Spiking Criteria

LCS Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml	Recovery Limits (%)
gamma-BHC	0.05	1	50-120
Heptachor epoxide	0.05	1	50-120
Dieldrin	0.01	1	30-130
4,4'-DDE	0.01	1	50-150
Endrin	0.01	1	50-120
Endosulfan sulfate	0.01	1	50-120
gamma-Chloradane	0.05	1	30-130
Tetrachloro-m-xylene(surrogate)	0.20	3	30-150
Decachlorobiphenyl (surrogate)	0.40	3	30-150

Note: The LCS might be spiked with the same analytes at the same concentration as the matrix spike.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed ~~in table above?~~ lab SOP/client SAP [✓] ___ ___

YES NO N/A

ACTION: For LCS % recovery not meeting the required recovery, follow the required action in Table 4 below.

Table 4. LCS Recovery Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Upper Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [✓] ___ ___

NOTE: For soil and waste samples showing detectable amounts of organics, the lab may substitute replicate samples in place of the matrix spike (see page 8000B-40, section 8.5.3).

5.2 Have MS/MD or MS/MSD results been summarized on Form III/Equivalent? [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000B-39, section 8.5.])

		YES	NO	N/A
a.	Water	[✓]	___	___
b.	Waste	[ ]	___	✓
c.	Soil/Solid	[ ]	___	✓

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 ~~We~~ Were Matrix Spike Samples analyzed at the required concentration for all analytes of interest as specified ~~in Table 5 below~~ In lab SOP / Client SAP [ ] ✓ ___ ___

Note: Spiking analytes may differ from those in Table 5. Check QA project plan or task order. See Form 3s

Table 5. Matrix Spiking Criteria

Matrix Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml
gamma-BHC	0.05	1
Heptachor	0.05	1
Aldrin	0.05	1
Dieldrin	1.0	1
Endrin	1.0	1
4,4'-DDT	1.0	1

Note: For aqueous organic extractable, the spike concentration should be:

1) For regulatory compliance monitoring - the regulatory concentration limit or 1 to 5 times the expected background concentration, whichever is higher;

2) For all other aqueous samples - the larger of either 1 to 5 x times the expected background

3

PESTICIDE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

VWW06-SW016-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/4022

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	MS CONCENTRATION UG/L	MS % REC #	QC LIMITS REC.
alpha-BHC	0.53	0	0.51	96.2	60 - 130
beta-BHC	0.53	0	0.71	134.0*	65 - 125
delta-BHC	0.53	0	0.41	77.4	45 - 135
gamma-BHC (Lindane)	0.53	0	0.56	106.0	25 - 135
Heptachlor	0.53	0	0.34	64.2	40 - 130
Aldrin	0.53	0	0.28	52.8	25 - 140
Heptachlor epoxide	0.53	0	0.42	79.2	60 - 130
Endosulfan I	0.53	0	0.44	83.0	50 - 110
Dieldrin	0.53	0	0.44	83.0	60 - 130
4,4'-DDE	0.53	0	0.40	75.5	35 - 140
Endrin	0.53	0	0.41	77.4	55 - 135
Endosulfan II	0.53	0	0.44	83.0	30 - 130
4,4'-DDD	0.53	0	0.49	92.5	25 - 150
Endosulfan sulfate	0.53	0	0.44	83.0	55 - 135
4,4'-DDT	0.53	0	0.40	75.5	45 - 140
Methoxychlor	0.53	0	0.41	77.4	55 - 150
Endrin aldehyde	0.53	0	0.39	73.6	55 - 135
gamma-Chlordane	0.53	0	0.38	71.7	60 - 125
alpha-Chlordane	0.53	0	0.41	77.4	65 - 125
Endrin ketone	0.53	0	0.54	102.0	75 - 125

NQ - not

Spike Recovery: 1 out of 20 outside limits

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

_____

Form III

170311 1719

3

PESTICIDE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/4 | VWW06-SW016-0211SD

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

COMPOUND	SPIKE ADDED UG/L	MSD CONCENTRATION UG/L	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
alpha-BHC	0.52	0.50	96.2	2.0	30	60 - 130
beta-BHC	0.52	0.70	135.0*	1.4	30	65 - 125
delta-BHC	0.52	0.43	82.7	4.8	30	45 - 135
gamma-BHC (Lindane)	0.52	0.54	104.0	3.6	30	25 - 135
Heptachlor	0.52	0.32	61.5	6.1	30	40 - 130
Aldrin	0.52	0.27	51.9	3.6	30	25 - 140
Heptachlor epoxide	0.52	0.44	84.6	4.7	30	60 - 130
Endosulfan I	0.52	0.45	86.5	2.2	30	50 - 110
Dieldrin	0.52	0.46	88.5	4.4	30	60 - 130
4,4'-DDE	0.52	0.40	76.9	0.0	30	35 - 140
Endrin	0.52	0.40	76.9	2.5	30	55 - 135
Endosulfan II	0.52	0.45	86.5	2.2	30	30 - 130
4,4'-DDD	0.52	0.48	92.3	2.1	30	25 - 150
Endosulfan sulfate	0.52	0.47	90.4	6.6	30	55 - 135
4,4'-DDT	0.52	0.39	75.0	2.5	30	45 - 140
Methoxychlor	0.52	0.41	78.8	0.0	30	55 - 150
Endrin aldehyde	0.52	0.41	78.8	5.0	30	55 - 135
gamma-Chlordane	0.52	0.38	73.1	0.0	30	60 - 125
alpha-Chlordane	0.52	0.41	78.8	0.0	30	65 - 125
Endrin ketone	0.52	0.45	86.5	18.2	30	75 - 125

NQ - no t

RPD: 0 out of 20 outside limits

Spike Recovery: 1 out of 20 outside limits

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

_____

Form III

170311 1719

YES NO N/A

concentration, or the same as the QC check sample concentration (see section 4 above);

3) For soil/solid and waste samples - the recommended concentration is 20 times the estimated quantitation limit (EQL).

No action is taken based on MS or replicate data alone. However, using informed professional judgement, the data reviewer may use the matrix spike or laboratory replicate results in conjunction with other QC criteria and determine the need for some qualification of the data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples.

5.5 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in ~~Table 6 below.~~ lab SOP/client SAP M ___ ___

Note: Use lab in-house criteria, if available.

Table 6. Matrix Spike Recovery Criteria

Compound	% Recovery Water	RPD Water	% Recovery Soil	RPD Soil
gamma-BHC	56-123	0-15	46-127	0-50
Heptachor	40-13	0-20	35-130	0-31
Aldrin	40-120	0-22	34-132	0-43
Dieldrin	52-126	0-18	31-134	0-38
Endrin	56-121	0-21	42-139	0-45
4,4'-DDT	38-127	0-27	23-134	0-50

NOTE: The actual number of MS analytes depends on the number analytes being measured (e.g., total number of MS plus MSD compounds). If only chlordane or toxaphene are the analytes of

YES NO N/A

interest, the spiked sample should contain the most representative multi-component analyte.

ACTION: Follow the matrix spike actions (Table 7) for pesticide analyses.

Table 7. Matrix Spike Qualifying Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% R ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limit	No qualifications	

Note: When the results of the matrix spike analyses indicates a potential problem due to the sample matrix itself, the LCS results are used to verify the laboratory can perform analyses in a clean matrix.

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on Method Blank Summary form(s) (Form IV)?

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? IV ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any other time during the analytical shift.

YES NO N/A

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for pesticides? [✓] ___ ___

ACTION: Use professional judgement to determine the effect on the data.

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for organochlorine pesticides? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ [✓] ___

7.2 Do any field/rinse blanks have positive organochlorine pesticide results? ___ [✓] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in

YES NO N/A

another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 8 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 8. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying the calibration criteria.

Note: When applied as described in Table 8 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams", "junk peaks"), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference.

YES NO N/A

Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? ☑ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic column used for the analysis of organochlorine pesticides? Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (See Method 8081B-8, section 4.2) ☑ ___ ___

8.2 If capillary columns were used, were they both wide bore (.53 mm ID) fused silica GC columns, such as DB-608 and DB-1701 or equivalent. Indicate the specific type of column used for:

column 1: STX-CLP1

column 2: STX-CLP2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. DDT/endrin breakdown check ☑ ___ ___

Initial Calibration Date: 1/22/11, Instrument SECD03 - Column 1
RRF and %RSD Calculations:

Compound Name: heptachlor in Level 1
Lab Value: 12193.0000

Area of Compound	12193
Conc. of Compound	1
Calculated CF	12193.000

Compound Name: heptachlor
Lab Value: 5.5

CF of STD 1	12193.000
CF of STD 2	12856.400
CF of STD 3	12581.200
CF of STD 4	12975.900
CF of STD 5	12759.567
CF of STD 6	13131.338
CF of STD 7	14639.640
CF of STD 8	12981.887
Calculated % RSD	5.52

Continuing Calibration File ID: 2/10/11, 0338; file ID PCCV5.D
RRF and %D Calculations:

Compound Name: 4,4'-DDD
Lab Value: 10763.0000

Area of Compound	430520
Conc. of Compound	40
Calculated CF	10763.000

Compound Name: 4,4'-DDD
Lab Value: 14.9

Average CF	9366.731
CF of CCV	10763
Calculated % D	-14.9

		YES	NO	N/A
b.	toxaphene	[Y]		
c.	technical chlordane	[Y]		
d.	5 pt. initial calibration standards	[Y]		
e.	calibration verification standards	[Y]		
f.	LCS	[Y]		
g.	Method blanks	[Y]		

ACTION: If no, take action specified in 3.2 above.

9.2 Has a DDT/endrin breakdown check standard (at the mid-concentration level) been analyzed at the beginning of each analytical sequence on both columns (page 8081B-24, section 8.2.3)? [Y]

ACTION: If no, take action as specified in 3.2 above.

9.3 Has the individual % breakdown exceeded 20.0% on either column for:

- 4,4' - DDT? [Y]
- endrin? [Y]

ACTION: If any % breakdown has failed the QC criteria in the breakdown check standard, qualify all sample analyses in the entire analytical sequence as described below.

a. If 4,4'-DDT breakdown is greater than 20.%:

i. Qualify all positive results for DDT with 'J". If DDT was not detected, but DDD and DDE are positive, then qualify the quantitation limit for DDT as unusable ("R").

ii. Qualify positive results for DDD and DDE as presumptively present at an approximated quantity ("NJ").

YES NO N/A

b. If endrin breakdown is greater than 20.0%:

i. Qualify all positive results for endrin with "J". If endrin was not detected, but endrin aldehyde and endrin ketone are positive, then qualify the quantitation limit for endrin as unusable ("R").

ii. Qualify positive results for endrin ketone and endrin aldehyde as presumptively present at an approximated quantity ("NJ").

9.4 Are data summary forms (containing calibration factors or response factors) for the initial 5 pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? ☑ ___ ___

NOTE: If internal standard calibration procedure is used (page 8000B-16, section 7.4.2.2), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (page 8000B-16, section 7.4.2.1), then calibration factors must be used.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.5 Are there any transcription/calculation errors between raw data and data summary forms. ___ ☑ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.6 Are standard retention time (RT) windows for each analyte of interest presented on modified CLP summary forms? ☑ ___ ___

YES NO N/A

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all pesticides are established using retention times from three calibration standards analyzed during the entire analytical sequence (page 8081B-15, section 7.4.6).

A 72 hr. sequence is not required with this method, however, the method states that best results are obtained using retention times which span the entire sequence; i.e., using the mid level from the 5 pt. calibration, one of the mid-concentration standards analyzed during mid-sequence and one analyzed at the end.

9.7 Were RT windows on the confirmation column established using ~~three standards as described above?~~ lab SOP. [Y] ___ ___

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.6 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.8 Do all standard retention times in each level of the initial 5 pt. calibrations for pesticides fall within the windows established during the initial calibration sequence? [Y] ___ ___

ACTION: i. If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standards, spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows

YES NO N/A

may be too tight. If so, RT windows should be recalculated as per page 8081B-15, section 7.4.6.2

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

ACTION: For toxaphene and chlordane, the RT may be outside the RT window, but these analytes may still be identified from their individual patterns.

9.9 Has the linearity criteria for the initial calibration standards been satisfied for both columns? (% RSD must be < allowable limits* for all analytes). [Y] ___ ___

ACTION: If no, follow the actions in Table 9 below.

Table 9. Initial Calibration Linearity Criteria

Criteria	Criteria	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD exceeds allowable limits*	J	No qualification
% RSD within allowable limits*	NO qualifications	

* %RSD ≤ 20% for single component compounds except alpha-BHC and delta-BHC.
%RSD ≤ 25% for alpha-BHC and delta-BHC
%RSD ≤ 30% for Toxaphene peaks
%RSD ≤ 30% for surrogates(tetrachloro-m-xylene and decachlorobiphenyl).

9.10 Has a calibration verification standard containing all analytes of interest been analyzed on each

YES NO N/A

working day, prior to sample analyses (pages 8081B-15, sections 7.5.2)? [Y] ___ ___

9.11 Has a calibration verification standard also been analyzed after every ~~10~~ 20 per method samples and at the end of each analytical sequence (page 8081B-15, section 7.5.2)? [Y] ___ ___

ACTION: If no, take action as specified in section 3.2 above.

9.12 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence (closing CCV). Has no more than 72 hours elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene CCV? [Y] ___ ___

ACTION: See Table 10 below.

9.13 Has the percent difference (%D) exceeded ± 20% for any organochlorine pesticide analyte in any calibration verification standard? [✓] [ ] ___

9.14 Has a new 5 pt. calibration curve been generated for those analytes which failed in the calibration verification standard (page 8081B-16, section 7.5.2.2), and all samples which followed the out-of-control standard (page 8081B-16, section 7.5.2.3) reinjected? [ ] ___ [✓]

ACTION: If the %D for any analyte exceeded the ± 20% criterion and the instrument was not recalibrated for those analytes, see table below.

9.15 Have <u>daily</u> retention time windows been properly calculated for each analyte of interest (page 8081B-16, section 7.5.3)), using RTs from the associated mid concentration standard and standard deviation from the initial calibration)? per lab SOP [✓] ___ ___

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO111

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Instrument ID: SECD03 CalibrationDate: 02/09/11 Time: 2312

CCV ID: CCV949933 Lab File ID: PCCV4.D Init. Calib. Date Begin: 01/22/11 End: 01/22/11

GC Column: STX-CLP2 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
alpha-BHC	25613.363	21792.775	14.9	AVRG
beta-BHC	10900.48	9062.875	16.9	AVRG
delta-BHC	22659.045	19323.95	14.7	AVRG
gamma-BHC (Lindane)	22661.215	19287.15	14.9	AVRG
Heptachlor	23518.546	18224.3	22.5	AVRG
Aldrin	20992.023	17642.45	16.0	AVRG
Heptachlor epoxide	19544.742	16182.325	17.2	AVRG
Endosulfan I	17997.149	15054.35	16.4	AVRG
Dieldrin	19606.746	16599.35	15.3	AVRG
4,4'-DDE	19329.597	16723.45	13.5	AVRG
Endrin	17007.829	14463.05	15.0	AVRG
Endosulfan II	16899.22	13949.475	17.5	AVRG
4,4'-DDD	15899.995	13230.475	16.8	AVRG
Endosulfan sulfate	14771.739	12405.9	16.0	AVRG
4,4'-DDT	16088.249	13319.6	17.2	AVRG
Methoxychlor	8195.7941	6594	19.5	AVRG
Endrin aldehyde	14208.964	11518.725	18.9	AVRG
gamma-Chlordane	20173.884	16552.675	17.9	AVRG
alpha-Chlordane	19414.604	16064.25	17.3	AVRG
Endrin ketone	19710.863	16358.5	17.0	AVRG
==========				
2,4,5,6-tetrachloro-m-xylene(SURR)	16741.21	14744.675	11.9	AVRG
Decachlorobiphenyl(SURR)	13957.776	11353.05	18.7	AVRG

Average Used: 16.6

<- NQ

No samples associated

7

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO111

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Instrument ID: SECD03 CalibrationDate: 02/10/11 Time: 0805

CCV ID: CCV949936 Lab File ID: PCCV6.D Init. Calib. Date Begin: 01/22/11 End: 01/22/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
alpha-BHC	13783.948	16358.75	18.7	AVRG
beta-BHC	6005.0525	6481.025	7.9	AVRG
delta-BHC	12552.014	14798.475	17.9	AVRG
gamma-BHC (Lindane)	12267.139	14267	16.3	AVRG
Heptachlor	13014.867	13839.85	6.3	AVRG
Aldrin	11689.867	13279	13.6	AVRG
Heptachlor epoxide	11176.018	12714.925	13.8	AVRG
Endosulfan I	10592.932	12302.35	16.1	AVRG
Dieldrin	11102.227	12859.625	15.8	AVRG
4,4'-DDE	10744.475	13001.3	21.0	AVRG
Endrin	9716.8575	9688.675	0.3	AVRG
Endosulfan II	9693.3748	10425.1	7.5	AVRG
4,4'-DDD	9366.7311	11157.8	19.1	AVRG
Endosulfan sulfate	8576.1505	9698.5	13.1	AVRG
4,4'-DDT	9536.5232	10505.025	10.2	AVRG
Methoxychlor	4909.6496	5025.4	2.4	AVRG
Endrin aldehyde	8155.3272	8986.8	10.2	AVRG
gamma-Chlordane	11583.395	11084.675	4.3	AVRG
alpha-Chlordane	11026.805	12435.625	12.8	AVRG
Endrin ketone	11161.001	11892.975	6.6	AVRG
==========				
2,4,5,6-tetrachloro-m-xylene(SURR)	8627.5763	8922.075	3.4	AVRG
Decachlorobiphenyl(SURR)	7247.6127	10497.75	44.8	AVRG

Average Used: 12.8

<- NQ Not increase in response

<- NQ

closer - all associated

YES NO N/A

ACTION: If no, take action specified in section 3.2 above or recalculate RT windows using the procedure outlined in method 8081B-16, section 7.5.3.

9.16 Do all standard retention times for each mid concentration standard fall within the windows established during the initial calibration sequence? [ ] ___ ✓

9.17 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows (page 8081B-16, section 7.5.3)? per updated RTW's [✓] ___ ___

ACTION: If the answer to either 9.15 or 9.16 above is no, check the chromatograms of all samples which followed the last in-control standard. All samples analyzed after the last in-control standard must be re-injected, if initial analysis indicated the presence of the specific analyte that exceeded the retention time criteria (page 8081B-18, section 7.5.7.). If samples were not re-analyzed, document under Contract Non-compliance in the Data Assessment.

Reviewer has two options to determine how to qualify questionable sample data. First option is to determine if possible peaks are present within daily retention time window. If no possible peaks are found, non-detects are valid. If possible peaks are found (or interference), qualify positive hits as presumptively present "NJ" and non-detects are rejected "R". Second option is to use the ratio of the retention time of the analyte over the retention time of either surrogate. The passing criteria is ± 0.06 RRT units of the RRT of the standard component. Reject "R" all questionable analytes exceeding criteria, and "NJ" all other positive hits.

For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use option 2 specified in paragraph above.

YES NO N/A

See Table 10 below.

Table 10. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RT out of RT window	Use professional judgement	
%D not within +/- 20%	J	UJ
Time elapsed greater than section 9.12 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.18 Are there any transcription/calculation errors between raw data and data summary forms? ___ [U] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [Y] ___ ___

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [Y] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it

YES NO N/A

accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

11.0 Extraction Method Cleanup Efficiency Verification (Form IX/Equivalent)

11.1 Method 8081B permits a variety of extraction techniques to be used for sample preparation. Which extraction procedure was used?

1. Aqueous samples:

1. Separatory funnel (Method 3510) ✓

2. Continuous liquid-liquid extraction (Method 3520) _____

3. Solid phase extraction (Method 3535) _____

4. Other _____

2. Solid samples:

1. Soxhlet (Method 3540) _____

2. Automated Soxhlet (Method 3541) _____

3. Pressurized fluid (Method 3545) _____

4. Microwave extraction (Method 3546) _____

5. Ultrasonic extraction (Method 3550) _____

6. Supercritical fluid (Method 3562) _____

7. Other _____

11.2 Is Form IX - Pest-1/Equivalent present and complete for each lot of Florisil/Cartridges used? (Florisil Cleanup, Method 3620A, is required for all organochlorine pesticide extracts.) [ ] ___ ✓

YES NO N/A

ACTION: If no, take action specified in 3.2 above. If data suggests that florisil cleanup was not performed, make note in the reviewer narrative.

NOTE: Method 3620A uses Florisil, while the SOW/CLP allows for Florisil cartridges. Method 3620A does not list which pesticides and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct pesticide list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.3 Are all samples listed on modified CLP Pesticide Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.4 If GPC Cleanup was performed, is Form IX - Pest-2/ Equivalent present? [ ] ___ ___ ✓

ACTION: If GPC was not performed and sample results indicate significant sulfur interference, make note in the data assessment.

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.5 Were the same compounds on Form IX used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.6 Are percent recoveries (% R) of the pesticide and surrogate compounds used to check the efficiency of the cleanup procedures within QC limits listed on Form IX:

80-120% for florisil cartridge check? [ ] ___ ✓

80-110% for GPC calibration? [ ] ___ ✓

YES NO N/A

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 80%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for pesticide compounds. Qualify positive results "J" (estimated).

NOTE: If 2,4,5-trichlorophenol was used to measure the efficiency of the Florisil cleanup and the recovery was > 5%, sample data should be evaluated for potential interferences.

12.0 Pesticide Identification

12.1 Has CLP Form X, showing retention time data for positive results on the two GC columns, been completed for every sample in which a pesticide was detected? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and Florisil cleanup verification forms)? ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both analyses? [✓] ___ ___

Note: Confirmation can be supported by other qualitative techniques such as GC/MS (Method 8270), or GC/AED (Method 8085) if sensitivity permits.

YES NO N/A

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently (see section 9.7 above). Also check for false negatives among the multiple peak compounds toxaphene and chlordane. Were there any false negatives? ___ [✓] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation used as the second column Confirmation? (This is not required). [ ] ___ ✓

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns, ~~≤25.0%?~~ <40%. per method No results in field samples! [ ] ___ ✓

NOTE: The method 8081B requires quantitation from one column. The second column is to confirm the presence of an analyte. Calibration for the Confirmation column is a one point calibration. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

YES NO N/A

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier
0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected) "NJ"	
>50% (Pesticide vale is <CRQL)	"U"
>201%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that the higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ [V] ___

NOTE: Single-peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

SAMPLE CALCULATION

Sample ID: VWW6-SW016-0211MS
Standard ID: ICAL 1/22/11
Compound: Endrin
Concentration: 0.41 ug/L

	Water (ug/L)	Soil (ug/Kg)
Area of Compound	382645	
CF of Compound	9716.8575	
Final Volume	10	
Dilution Factor	1	
Split Factor	1	
Injection Volume	1	
Weight of Sample	na	
Initial Volume of Sample	950	NA
Conversion Factor	1	
Percent Solids Factor	1	
Concentration	0.41452	#DIV/0!

YES NO N/A

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? ☑ ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? ☑ ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ ☑ ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for organochlorine pesticide analysis? ☐ ☑ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made to determine the proper identification of field duplicates.

Yes NO N/A

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 3501997

LAB: PEL SITE: Viegues SWMUG

1.0 Data Completeness and Deliverables

1.1 Has all the data been submitted in CLP deliverable format? ☑ ___ ___

1.2 Have any missing deliverables been received and added to the data package? ☐ ___ ✓ ___

Resubs / corrections received

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? ☑ ___ ___

2.2 Are the case number and/or SDG number contained in the narrative or cover letter? ☑ ___ ___

3.0 Data Validation Checklist

3.1 Does this data package contain:

Water data? ✓ ___

Waste data? ___ ✓

Soil/solid data? ___ ✓

POLYCHLORINATED BIPHENYLS

1.0 Traffic Reports and Laboratory Narrative

1.1 Are ~~traffic report~~ and chain-of-custody forms present for all samples? ☑ ___ ___

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8082 for Aroclor analysis.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8082 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

PCB 1016 and PCB 1260 were used as the spiking solution for all QC spikes.

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

E. Internal Standards:

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

This method does not require the use of internal standards.

F. Samples:

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:

Name: Brian C. Spaan Title: Lab Director

SIGNED: **DATE:** 03/01/2011

Yes NO N/A

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ___ [V] ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, non detects shall be qualified as unusable, "R."

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any PCB technical holding times, determined from date of collection to date of extraction, been exceeded? ___ [V] ___

Water and waste samples for PCB analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction. Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

ACTION: If technical holding times are exceeded, flag all positive results as estimated, "J," and sample quantitation limits "UJ" and document in the narrative that holding times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all the data should at least be

Yes NO N/A

qualified "J", but the reviewer may determine that non-detects are unusable, "R." (Table 1)

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [U] ___ ___

Yes NO N/A

b. Soil/Solid [ ] ___ ✓

3.2 Are all the PCB samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ ✓

c. Soil/Solid [ ] ___ ✓

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ for all samples, including MS and MSDs, LCSs and all blanks? [✓] ___ ___

Lab SOP's

Note: Reviewer shall use lab in-house recovery limits, if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate criteria, Table 2.

Note: DCB is used when PCBs are determined as Aroclors. DCB is the internal standard when determining PCB congeners and TCMX the surrogate.

3.4 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate criteria, Table 2.

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement

Yes NO N/A

150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample (LCS)

4.1 Are raw data and percent recoveries present for all Laboratory Control samples as required by Method 8000B (section 8.5) and Method 8082A (section 8.4.2)? ✓ ___ ___

Verify that QC check samples were extracted and analyzed by the same procedures used for the actual samples.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation/ resubmittals. Make note in the data assessment.

NOTE: For aqueous samples, an additional QC check sample must be prepared and analyzed when any analyte in a matrix spike fails the required acceptance criteria (see section 5.3 below).

Yes NO N/A

The additional QC check sample must contain each analyte that failed in the MS analysis.

Note: When the results for matrix spike analysis indicates a problem due to sample matrix effects, the LCS results are used to verify the laboratory can perform the analysis in a clean sample.

4.2 Were Laboratory Control Samples analyzed at the required concentration as specified ~~in Method 8000B (sec 8.5)~~ for all analytes as specified in Table 3. per lab SOP [X] ___ ___

Note: Use lab in-house criteria, if available.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Were the LCS recoveries within the percent recoveries as specified ~~in Table 3.~~ lab SOP/client SAP [✓] ___ ___

Table 3. LCS Criteria

Compound	% Recovery
Aroclor 1016	50-150
Aroclor 1260	50-150
Tetrachloro-m-xylene (surrogate)	30-150
decachlorobiphenyl (surrogate)	30-150

4.4 If no, were Laboratory Control Samples re-analyzed? [ ] ___ ✓

ACTION: If QC check samples were not re-analyzed, or a general system problem is indicated by repeated failure to meet the QC acceptance criteria specified in the method, make note in the data assessment and use Table 4 recovery actions criteria.

Yes NO N/A

Table 4. LCS Recovery Actions

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Lower Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for one matrix spike and matrix duplicate (unspiked) pair (MS/Dup) or matrix spike/matric spike duplicate (MS/MSD)present and complete for each matrix (Method 8082A Section 8.4.1)? [4] ✓ ___ ___

NOTE: For soil and waste samples showing detectable amounts of target analytes, the lab may substitute replicate samples in place of the matrix spike (see Method 8000B-40, section 8.5.3).

X2 Com JAC 41411 NO MS/MSD in this SDG

5.2 Have MS/Dup or MS/MSD results been summarized on modified CLP Form III? [4] ___ ✓ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/Dup, MS/MSD must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month (Method 8000B-39 (section 8.5)).

a. Water

X1 Com JAC 41411 [4] ___ ✓ ___

	Yes	NO	N/A
b. Waste	[ ]	___	✓
c. Soil/Solid	[ ]	___	✓

ACTION: If any MS/Dup or MS/MSD data are missing, take the action specified in 3.2 above.

5.4 Were ~~Laboratory Control~~ MS/MSD Samples analyzed for all analytes as specified in ~~Table 5,~~ or did the lab use the optional QC acceptance criteria i.e., in-house criteria? [✓] ___ ✓

List the criteria used and make note in data assessment.

Criteria used _____

Table 5. MS/MSD Criteria

Compound	Percent Recovery QC Limits	RPD
Aroclor 1016	29-135	0-15
Aroclor 1260	29-135	0-20

5.5 Was the matrix spike prepared at the proper spike concentration? (Method 8000B, section 8.5.1-8.5.2) [ ] ___ ___ ✓

For aqueous organic extractable, the spike concentration should be prepared according options in: Method 8000B-40, (section 8.5.1 and 8.5.2).

5.6 Were the matrix spike and matrix spike duplicate recovery and RPD limits met as specified in Table 5. Note: No qualification of the data is necessary on MS and MSD data alone. Use professional judgement to use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If any MS and MSD, percent recovery, or RPD results in the Arcolor fraction is out of specification (Table 5), qualify data to include the consideration of the existence interference in the raw data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples. Use professional judgement to determine the need for qualifications of detects of non-spiked compounds.

Yes NO N/A

[ ] ___ ✓

Table 6. MS/MSD Actions for Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on CLP equivalent Method Blank Summary form(s) (Form IV)? ✓ [ ] ___ ___

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ✓ [ ] ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any time during the analytical shift.

ACTION: If any blank data are missing, take action as specified above (section 3.2) . If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system

Yes NO N/A

printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for PCBs? ✓

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ✓

7.2 Do any field/rinse blanks have positive PCB results? ✓

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 7 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 7. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples

Yes NO N/A

Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying for calibration criteria.

Note: When applied as described in Table 7 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

Yes NO N/A

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic capillary column used for the analysis of PCBs? ☑ ___ ___

Action: Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (Method 8082, section 4.2)

8.2 Indicate the specific type of narrow bore or wide bore (.53 mm ID, fused silica GC columns, such as DB-608 and DB-1701 or equivalent).

column 1: STX CLP1

column 2: STX CLP2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. Samples ☑ ___ ___

b. All blanks ☑ ___ ___

c. Matrix spike samples ☑ ___ ___

d. 5 pt. initial calibration standards ☑ ___ ___

e. calibration verification standards ☑ ___ ___

f. Laboratory Control samples (LCS) ☑ ___ ___

ACTION: If no, take action specified in 3.2 above.

9.2 Are data summary forms (containing calibration factors or response factors) for the initial 5

Yes NO N/A

pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? ☑ ___ ___

Note: Calibration Aroclor mixtures other than 1016/1260 may be used (as per approved project QA plan)

NOTE: If internal standard calibration procedure is used (Method 8000B-15(section 7.4.2.2)), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (Method 8000B-16 (section 7.4.2.1)), then calibration factors must be used. The internal standard approach is highly recommended for PCB congener analysis.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.3 Are there any transcription/calculation errors between raw data and data summary forms? ___ ☑ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.4 Are standard retention time (RT) windows for each PCB peak of interest presented on modified CLP summary forms? ☑ ___ ___

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all PCBs are established using retention times from three calibration standards analyzed during the entire analytical sequence (Method 8000B, section 7.6). Best results are obtained

Yes NO N/A

using retention times which span the entire sequence; i.e., using the calibration verification/continuing calibration standards analyzed every 12 hours.

9.5 Were RT windows on the confirmation column established using ~~three standards~~ lab SOP as described above? ✓ ___ ___

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.4 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.6 Do all standard retention times in each level of the initial 5 pt. calibrations for PCBs fall within the windows established during the initial calibration sequence? ✓ ___ ___

ACTION i: If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standard spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows may be too tight. If so, RT windows should be recalculated as per Method 8081B-15 (section 7.4.6).

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

9.7 Has the linearity criteria for the initial calibration standards been satisfied for both

Yes NO N/A

columns? (% RSD for the calibration factors (CFs) for the three to five major peaks of each of the Aroclor compounds must be < 20.0%). [Y] ___ ___

ACTION: If no, follow Table 8 criteria.

Table 8. Initial Calibration CF Action for Aroclor Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD > 20%	J	UJ
% RSD within allowable limits	No qualifications	

9.8 Does the calibration verification/continuing calibration standard contain the PCB peaks of interest, analyzed on each working day, prior to sample analyses (Method 8082, sections 7.6.2)? [Y] ___ ___

9.9 Has a calibration verification/continuing calibration standard been analyzed after every ~~10~~ samples and at the end of each analytical sequence (Method 8082A, section 7.6.2). 20 per method [Y] ___ ___

ACTION: If no, take action as specified in section 3.2 above.

9.10 Has the percent difference (%D) between the Calibration Factor (CF) of each of the three to five peaks used to identify the Aroclor in the CCV and the CF from these peaks in the initial calibration exceeded ± ~~15%~~. 20% per method. ___ [Y] ___

9.11 Has a new 5 pt. initial calibration curve been generated for those PCB analytes which failed in the calibration verification/continuing calibration standard (8000B, section 7.7.3), and all samples which followed the out-of-control

Initial Calibration Date: 2/10/11, on STX-CLP1
RRF and %RSD Calculations:
Compound Name: AR1260 peak 2 in level 2
Lab Value: 8834600.0000

Area of Compound	176692
Conc. of Compound	0.02
Calculated CF	8834600.000

Compound Name: AR1260 Peak 2
Lab Value: 10.2

CF of STD 1	9755833.333
CF of STD 2	8834600.000
CF of STD 3	8231710.000
CF of STD 4	7482520.000
CF of STD 5	7794005.000
CF of STD 6	7773178.000
CF of STD 7	
CF of STD 8	
Calculated % RSD	10.22

Continuing Calibration File ID: 2/11/10, 1710
RRF and %D Calculations:
Compound Name: AR1260, peak 4
Lab Value: 22580560.0000

Area of Compound	2258056
Conc. of Compound	0.1
Calculated CF	22580560.000

Compound Name: AR1260, peak 4
Lab Value: 7.8

Average CF	20944279.000
CF of CCV	22580560
Calculated % D	-7.8

Yes NO N/A

calibration verification/standard continuing calibration Standard? [ ] ___ ✓

ACTION: If the %D for any analyte exceeded the ± 15% criterion and the instrument was not recalibrated for those analytes, qualify positive results for all associated samples (those which followed the out-of-control standard) "J" and sample quantitation limits "UJ". (see Table 9)

9.12 Have retention time (RT) windows been properly calculated for each analyte of interest (Method 8000B, section 7.6), using RTs from the associated calibration verification/continuing standard? [✓] ___ ___

per SOP

ACTION: If no, take action specified in section 3.2 above

9.13 Do all standard retention times for each calibration verification/continuing calibration standard fall within the windows established during the initial calibration sequence? [✓] ___ ✓

9.14 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows. [✓] ___ ___

XI corr JAC 4/4/11

C/in updated RTWS

ACTION: For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use paragraph B below. If the answer to either 9.13 or 9.14 above is no, check the chromatograms of all samples which followed the last in-control standard. If samples were not re-analyzed, all samples analyzed after the last in-control standard must be evaluated using professional judgement.

(A) For non-detected target compounds, check to see if the sample chromatograms contain any peaks that are close to the expected RT window of the Arcolor of interest. If no peaks are present, no qualification of data is necessary. If peaks are present close th RT window of the Aroclor of interest, qualify the non-detected values as presumptively present "N".

Yes NO N/A

(B) For detected compounds in the affected samples, if peaks within the RT window, no qualification necessary. If peaks are close to the expected RT window of the Aroclor of interest, the reviewer can examine the data package for the presence of three or more standards the Aroclor of interest that were run within the analytical sequence during which the sample was analyzed. If three or more such standards are present, the RT window can be reevaluated using the Mean Retention Times of the standards. If the peaks in the affectd sample fall within the revised window, qualify the detected target compounds "NJ". If the reviewer cannot do anything with the data to resolve the problem of concern, qualify all non-detects as unusable "R". (Table 9)

9.15 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence sequence (closing CCV). (Table 9) [✓] ___ ___

Table 9. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	**Non-Detected Associated Compounds**
RT out of RT window	Use professional judgement (Sec 9.14)	
%D not within +/- 15%	J	UJ
Time elapsed greater than section 9.15 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.16 Are there any transcription/calculation errors between raw data and data summary forms? ___ [✓] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [✓] ___ ___

Yes NO N/A

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

10.3 Were the TCMX/DCB surrogate RTs for the samples within the mean surrogate RT from the initial calibration? [✓] ___ ___

Action: If no, see "Action" in section 9.14 above

11.0 Extraction Techniques for Sample Preparation

Method 8082A permits a variety of extraction techniques to be used for sample preparation. Check which extraction procedure was used?

1. Aqueous samples:

    1. Separatory funnel (Method 3510) [✓] ___ ___
    2. Continuous liquid-liquid extraction (Method 3520) [ ] ___ ___
    3. Solid phase extraction (Method 3535) [ ] ___ ___
    4. Other [ ] ___ ___

2. Solid samples:

    1. Soxhlet (Method 3540) [ ] ___ ___
    2. Automated Soxhlet (Method 3541) [ ] ___ ___
    3. Pressurized fluid (Method 3545) [ ] ___ ___
    4. Microwave extraction (Method 3546) [ ] ___ ___
    5. Ultrasonic extraction (Method 3550) [ ] ___ ___

Yes NO N/A

6. Supercritical fluid (Method 3562) [ ] ___ ___

7. Other [ ] ___ ___

11.1 Extract Cleanup - Efficiency Verification (Form IX/Equivalent)

11.1.1 Method 8082 (section 7.2) references method 3660 (sulfur) and 3665A (sulfuric acid) to use for cleaning extracts. Were one or both method used? [✓] ✓

ACTION: If no, take action specified in 3.2 above. If data suggests cleanup was not performed, make note in the data assessment.

XICOM JAC 4/19/11

NOTE: Method 3620A, Florisil, may be used per approved project QA plan. The method does not list which analytes and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct PCB list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.2 Are all samples listed on modified CLP PCBs Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.3 Was GPC Cleanup (method 3640A) performed? [ ] ___ ✓

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.4 Were the same PCB analytes used in calibration used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.5 Are percent recoveries (% R) of the PCBs and surrogate compounds used to check the efficiency of the cleanup procedures within lab's in-house QC limits (use 70-130% if not available). [ ] ___ ✓

Yes NO N/A

70-130% for GPC calibration? [ ] ___ ✓

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 70%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for PCBs. Use professional judgement to qualify positive results if recoveries are greater than the upper limit.

12.0 PCB Identification

12.1 Has CLP Form X or equivalent, showing retention time data for positive results on the two GC columns, been completed for every sample in which a PCB was detected? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and cleanup verification forms)? ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both columns/analyses? [✓] ___ ___

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

Yes NO N/A

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently.
Were there any false negatives? ___ [✓] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation provided when sample concentration was sufficient (> 10 ug/ml) in the final extract? [ ] ___ ✓

ACTION: Indicate with red pencil which Form I results were confirmed by GC/MS and also note in data assessment. GC/MS confirmation is an option, see section 7.10 of Method 8082A-20. If GC/MS confirmation is not available, follow action in section 3.2.

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%?~~ <40% per method. [✓] ___ ___

NO + LA Samples.

NOTE: The method requires quantitation from one column. The second column is to confirm the presence of an analyte. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier

Yes NO N/A

0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected)	"NJ"
>50% (PCBs value is <CRQL)	"U"
>200%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that he higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ ✓ ___

NOTE: Single-peak PCBs results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? ✓ ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

SAMPLE CALCULATION

Sample ID: 70577LCS
Standard ID: ICAL 2/10/11
Compound: AR1260
Concentration: 1.6 ug/L (sum of 5 peaks)
Calculation shows Peak 1: 0.36 ug/L

	Water (ug/L)	Soil (ug/Kg)
Area of Compound	861334	
CF of Compound	4793066.111	
Final Volume	2000	
Dilution Factor	1	
Split Factor	1	
Injection Volume	1	
Weight of Sample	na	
Initial Volume of Sample	1000	NA
Conversion Factor	1	
Percent Solids Factor	1	
Concentration	0.35941	#DIV/0!

Peak #	Concentration
1	0.36
2	0.039
3	0.39
4	0.39
5	0.42
Total	**1.599**

Yes NO N/A

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? [✓] ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ [✓] ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for PCB analysis? [ ] [✓] ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made

Yes NO N/A

to determine the proper identification of field duplicates.

	YES	NO	N/A
A.I.1 **Contract Compliance Screening Report** Present?	[ ]		✓ not CLP
ACTION: If no, contact RSCC/PO.			
A.I.2 **Record of Communication (from RSCC)** Present?	[ ]		✓
ACTION: If no, request from the RSCC.			
A.1.3 **Sampling Trip Report** Present and complete?	[ ]		✓
ACTION: If no, contact RSCC/PO.			
A.I.4 **Chain of Custody/Sample Traffic Report** Present?	✓		
Legible?	✓		
Signature of sample custodian present?	✓		
ACTION: If no, contact RSCC/WAM/PO.			
A.I.5 **Cover Page** Present?	✓		
Is the Cover Page properly filled in and the verbatim signed by the lab manager or the manager's designee?	[ ]		✓ not CLP
Do the sample identification numbers on the Cover Page agree with sample Identification numbers on:			
(a) Traffic Report Sheet?	✓		

255

	YES	NO	N/A
(b) Form I's?	[✓]	___	___
Is the number of samples on the Cover Page the same as the number of samples on the Traffic Report sheet and the Regional Record of Communication (ROC) for the data Case?	[___]	___	✓ not CLP

ACTION:
If no for any of the above, prepare Telephone Record Log and contact RSCC/PO for re-submittal of the corrected Cover Page from the laboratory.

A.1.6 **SDG Narrative, DC-1 & DC-2 Form**

Is the SDG Narrative present?	[✓]	___	___
Is Sample Log-In Sheet(Form DC-1) present and complete?	[___]	___	✓ not CLP
Is Complete SDG Inventory Sheet(Form DC-2) present and complete?	[___]	___	✓

ACTION:
If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.

A.1.7 **Form I to XV**

A.1.7.1 Are all the Form I through Form XV labeled with:

Laboratory Name?	[✓]	___	___
Laboratory Code?	[✓]	___	___
RAS/Non-RAS Case No.?	[___]	___	✓
SDG No.?	[✓]	___	___

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB960936 was analyzed on 03/14/11 10:46. The following analyte(s) were detected below RL: Aluminum at 11.6 UG/L, Barium at 0.377 UG/L, Beryllium at 0.25 UG/L, Iron at 23.5 UG/L, Magnesium at 12.6 UG/L, Manganese at -0.437 UG/L, Potassium at 82.6 UG/L.
CCB960892 was analyzed on 03/14/11 11:56. The following analyte(s) were detected below RL: Beryllium at 0.122 UG/L, Iron at 9.3 UG/L, Manganese at -0.644 UG/L.
CCB960904 was analyzed on 03/14/11 13:01. The following analyte(s) were detected below RL: Beryllium at 0.129 UG/L, Iron at 11.6 UG/L, Manganese at -0.629 UG/L, Thallium at -5.54 UG/L.
CCB960905 was analyzed on 03/14/11 13:04. The following analyte(s) were detected below RL: Manganese at -0.707 UG/L.

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

CCB960942 was analyzed on 03/14/11 14:01. The following analyte(s) were detected below RL: Iron at 9.74 UG/L, Manganese at -0.77 UG/L, Sodium at 194 UG/L, Thallium at -4.42 UG/L.
CCB961057 was analyzed on 03/14/11 16:03. The following analyte(s) were detected below RL: Barium at 0.261 UG/L, Beryllium at 0.158 UG/L, Iron at 11.6 UG/L, Manganese at -0.59 UG/L, Thallium at -5.21 UG/L.
CCB961058 was analyzed on 03/14/11 16:07. The following analyte(s) were detected below RL: Iron at 9.28 UG/L, Manganese at -0.62 UG/L, Thallium at -4.58 UG/L.
CCB961070 was analyzed on 03/14/11 17:06. The following analyte(s) were detected below RL: Barium at 0.23 UG/L, Iron at 9.05 UG/L, Magnesium at 9.82 UG/L, Manganese at -0.635 UG/L, Sodium at 266 UG/L.
CCB961071 was analyzed on 03/14/11 17:09. The following analyte(s) were detected below RL: Manganese at -0.675 UG/L, Sodium at 226 UG/L.
CCB961083 was analyzed on 03/14/11 18:08. The following analyte(s) were detected below RL: Barium at 0.272 UG/L, Iron at 6.96 UG/L, Manganese at -0.665 UG/L, Thallium at -6.62 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. Method Blanks:

All acceptance criteria were met with the exception of:
Blank 70594MB was analyzed with the water samples on 03/14/11. The following analyte(s) were detected below RL: Barium at 0.265 UG/L, Calcium at 63.8 UG/L, Magnesium at 12.2 UG/L, Sodium at 187 UG/L. The hits in the blank are below the RL, therefore, no corrective action was taken.
Samples coded accordingly.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met.

3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

SD - VWW06-SW016-0211SD (at a 10X dilution) was analyzed with the water samples on 03/14/11. The following analyte(s) were recovered below criteria: Magnesium at 20 % with criteria of (80-120). The most probable cause for Magnesium exceeding limits for the MSD is sample matrix due to the sample requiring a 10X dilution for being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350199703L was analyzed with the water samples on 03/14/11. The following analyte(s) exceeded criteria: Barium at 14 % with criteria of (10). The most probable cause for Barium exceeding limits for the SD is sample matrix due to the sample requiring a 10X dilution for being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW001-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW001-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW002-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW002-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW014-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW014-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW015-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

Sample VWW06-SW015-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW016-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW016-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW017-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW017-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7470A.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7470A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350199703A was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

58.3 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.

All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW016-0211MS was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 60 % with criteria of (80-120).

SD - VWW06-SW016-0211SD was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 57.7 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. **Calibration Blanks:**
All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Aluminum at 21.3 UG/L, Barium at 0.347 UG/L, Beryllium at 0.328 UG/L, Iron at 31.2 UG/L, Magnesium at 19.2 UG/L, Manganese at -0.401 UG/L, Potassium at 98.8 UG/L, Thallium at 4.68 UG/L.
CCB961465 was analyzed on 03/15/11 15:46. The following analyte(s) were detected below RL: Manganese at -0.769 UG/L, Nickel at -2.12 UG/L, Vanadium at 0.526 UG/L.
CCB961477 was analyzed on 03/15/11 17:06. The following analyte(s) were detected below RL: Manganese at -0.806 UG/L, Nickel at -1.72 UG/L.
CCB961490 was analyzed on 03/15/11 18:31. The following analyte(s) were detected below RL: Manganese at -0.74 UG/L, Nickel at -2.24 UG/L.
CCB961502 was analyzed on 03/15/11 19:54. The following analyte(s) were detected below RL: Iron at 9.23 UG/L, Manganese at -0.752 UG/L, Nickel at -1.44 UG/L, Vanadium at 0.451 UG/L.

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

ICB961756 was analyzed on 03/16/11 07:38. The following analyte(s) were detected below RL: Aluminum at 12.7 UG/L, Barium at 0.238 UG/L, Beryllium at 0.258 UG/L, Iron at 24.8 UG/L, Magnesium at 15.4 UG/L, Manganese at -0.684 UG/L.
CCB961769 was analyzed on 03/16/11 11:27. The following analyte(s) were detected below RL: Manganese at -0.954 UG/L, Nickel at -0.931 UG/L.
CCB961780 was analyzed on 03/16/11 13:14. The following analyte(s) were detected below RL: Manganese at -0.931 UG/L, Thallium at 5.06 UG/L.
CCB961781 was analyzed on 03/16/11 13:17. The following analyte(s) were detected below RL: Manganese at -0.906 UG/L, Nickel at -1.17 UG/L.
CCB961793 was analyzed on 03/16/11 14:40. The following analyte(s) were detected below RL: Manganese at -0.881 UG/L, Thallium at 4.42 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350199703ADL1(at a 100X dilution) was analyzed with the water samples on 03/16/11. The following analyte(s) were recovered below criteria: Sodium at 57.2 % with criteria of (80-120). The most probable cause for Sodium exceeding limits is sample matrix due to the sample requiring a 100X dilution for Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.

3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

MS - VWW06-SW016-0211MS(at a 10X dilution) was analyzed with the water samples on 03/15/11. The following analyte(s) were recovered below criteria: Calcium at 76 % with criteria of (80-120), Magnesium at 40 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Selenium at 124 % with criteria of (80-120).

SD - VWW06-SW016-0211SD(at a 10X dilution) was analyzed with the water samples on 03/15/11. The following analyte(s) were recovered below criteria: Magnesium at 60 % with criteria of (75-125) and the following analyte(s) were recovered above criteria: Selenium at 130.4 % with criteria of

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

(75-125). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the sample requiring a 10X dilution due to being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350199703L(at a 50Xdilution) was analyzed with the water samples on 03/15/11. The following analyte(s) exceeded criteria: Barium at 14 % with criteria of (10). The most probable cause for the SDexceeding limits is sample matrix due to the sample requiring a 50X dilution due to being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:
Sample analysis proceeded normally.
Sample VWW06-SW001-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW001-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW002-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW002-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW014-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW014-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW015-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

Sample VWW06-SW015-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW016-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW016-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW017-0211 required a 10X dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW017-0211 required a 100X dilution due to high concentration of the following analyte(s): Sodium.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** **03/17/2011**

CASE NARRATIVE
MERCURY
DISSOLVED

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7470A.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7470A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350199703A was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

55.5 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.
MS - VWW06-SW016-0211MS was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 57.4 % with criteria of (80-120).

SD - VWW06-SW016-0211SD was analyzed with the water samples on 02/11/11. The following analyte(s) were recovered below criteria: Mercury at 57.4 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

W:\Narratives\Metals\3501\3501997_7470_d.doc

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : PEL Laboratories Inc.

Project: Vieques

Laboratory Workorder / SDG #: K0205

SW846 6020A

I. SAMPLE RECEIPT

No exceptions or unusual conditions were encountered unless a Sample Condition Notification Form, or other record of communication is included with the Sample Receipt Documentation.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

The metals analysis results are reported in two sub-SDGs, SK0205 and SK0205-D. The total metals analysis results are reported in SDG SK0205 and the dissolved metals analysis results are reported in SDG SK0205-D. The raw data for both sub-SDGs may be found following Form 14 of SDG SK0205-D.

III. METHODS

Samples were analyzed following procedures in laboratory test code: SW846 6020A

IV. PREPARATION

Aqueous Samples were prepared following procedures in laboratory test code: ICP_MS_W_PR(3005A)

V. INSTRUMENTATION

The following instrumentation was used to perform
Instrument Code: X1
Instrument Type: ICPMS
Description: X1
Manufacturer: ThermoFisher
Model: X-Series 2

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

Method blanks were within the acceptance criteria.

C. Spikes:

1. Laboratory Control Spikes (LCS):

Percent recoveries for lab control samples were within the QC limits.

2. Matrix spike (MS):

Matrix spike was performed on sample VWW06-SW016-0211 for both the total and dissolved metals. Percent recoveries were within the QC limits with the following exceptions:
VWW06-SW016-0211 (K0205-03AMS), Spike sample recovery is not within control limits, recovery is below criteria for Arsenic at 0% with criteria of (75-125) and Copper at 10% with criteria of (75-125) due to high dilutions causing the spike concentration to be over-diluted.
VWW06-SW016-0211 (K0205-03BMS-DISS), Spike sample recovery is not within control limits, recovery is above criteria for Chromium at 145% with criteria of (75-125), Copper at 136% with criteria of (75-125), Lead at 134% with criteria of (75-125) and recovery is below criteria for Arsenic at 0% with criteria of (75-125)

due to high dilutions causing the spike concentration to be over-diluted.

D. Post Digestion/Distillation Spike (PDS):

No PDS analyses were included in this SDG since the spike percent recovery failures were due to the high dilution required.

E. Duplicate sample:

Duplicate analyses were performed on sample VWW06-SW016-0211 for both the total and dissolved metals analyses. Relative percent differences were within the QC limits.

F. Serial Dilution (SD):

Serial Dilution analyses were performed on sample VWW06-SW016-0211 for both the total and dissolved metals analyses. Percent differences were within the QC limits.

G. Samples:

All samples (except for equipment blanks) required analysis at a 100X or 500X dilutions due to the high Sodium content, internal standard interference, and to protect the instrument. The lowest dilution was reported for each element based on the recoveries of the associated internal standards.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed: Agnes K Huntley

Date: 3/7/11

WorkOrder: K0205

02/14/2011 13:11

Mitkem Laboratories

Client ID: PEL
Project: Vieques
WO Name: Vieques
Location: CH2M_VIEQUES, 3501997
Comments: N/A

Case:
SDG:
PO: 3501997

HC Due: 02/22/11
Fax Due:
Fax Report: ☐

Report Level: LEVEL 4
Special Program: *DoD*
EDD:

Lab Samp ID	Client Sample ID	Collection Date	Date Recv'd	Matrix	Test Code	Samp / Lab Test Comments	HF	HT	MS	SEL	Storage
K0205-01A	VWW06-SW014-0211	02/07/2011 09:10	02/08/2011	Aqueous	SW6020_W	/ Total				Y	M5
K0205-01B	VWW06-SW014-0211	02/07/2011 09:10	02/08/2011	Aqueous	SW6020_W	Dissolved / Diss				Y	M5
K0205-02A	VWW06-SW015-0211	02/07/2011 08:50	02/08/2011	Aqueous	SW6020_W	/ Total				Y	M5
K0205-02B	VWW06-SW015-0211	02/07/2011 08:50	02/08/2011	Aqueous	SW6020_W	Dissolved / Diss				Y	M5
K0205-03A	VWW06-SW016-0211	02/07/2011 08:05	02/08/2011	Aqueous	SW6020_W	/ Total			Y	Y	M5
K0205-03B	VWW06-SW016-0211	02/07/2011 08:05	02/08/2011	Aqueous	SW6020_W	Dissolved / Diss			Y	Y	M5
K0205-04A	VWW06-SW017-0211	02/07/2011 07:45	02/08/2011	Aqueous	SW6020_W	/ Total				Y	M5
K0205-04B	VWW06-SW017-0211	02/07/2011 07:45	02/08/2011	Aqueous	SW6020_W	Dissolved / Diss				Y	M5
K0205-05A	VWW06-EB01-020711	02/07/2011 06:10	02/08/2011	Aqueous	SW6020_W	/ Total				Y	M5
K0205-05B	VWW06-EB01-020711	02/07/2011 06:10	02/08/2011	Aqueous	SW6020_W	Dissolved / Diss				Y	M5
K0205-06A	VWW06-SW001-0211	02/07/2011 10:20	02/08/2011	Aqueous	SW6020_W	/ Total				Y	M5
K0205-06B	VWW06-SW001-0211	02/07/2011 10:20	02/08/2011	Aqueous	SW6020_W	Dissolved / Diss				Y	M5
K0205-07A	VWW06-SW002-0211	02/07/2011 09:45	02/08/2011	Aqueous	SW6020_W	/ Total				Y	M5
K0205-07B	VWW06-SW002-0211	02/07/2011 09:45	02/08/2011	Aqueous	SW6020_W	Dissolved / Diss				Y	M5
K0205-08A	VWW06-EB02-020711	02/07/2011 11:20	02/08/2011	Aqueous	SW6020_W	/ Total				Y	M5

3501997

HF = Fraction logged in but all tests have been placed on hold

HT = Test logged in but has been placed on hold

Lab Client Rep: Shirley S Ng

SDG 27
436

		YES	NO	N/A
	Contract No.?	[✓]	___	___

ACTION:
If no for any of the above, note under Contract Problem/Non-Compliance Section of the "Data Review Narrative" and contact PO for corrected Form(s) from the laboratory.

A.1.7.2 After comparing values on Forms I-IX against the raw data, do any computation/ transcription errors exceed 10% of the reported values on the Forms for:

(a) all analytes analyzed by ICP-AES?	___	[✓]	___
(b) all analytes analyzed by ICP-MS?	_	[✓]	_
(c) Mercury?	_	[✓]	____
(d) Cyanide?	_	[ ]	✓

ACTION:
If yes, prepare Telephone Record Log and contact CLP PO/TOPO for the corrected data from the laboratory.

A.1.8 Raw Data

Data shall not be validated without the hard/electronic copies of the associated raw data for samples and QC samples.

A.1.8.1 Digestion/Distillation Log

Digestion Log for ICP-AES (Form XII)present?	[✓]	___	___
Digestion Log for ICP-MS (Form XII) present?	[✓]	___	___
Digestion Log for mercury (Form XII) present?	[✓]	___	___
Distillation Log for cyanide (Form XII) present?	[ ]	___	✓

Are pH values for metals and

	YES	NO	N/A
cyanide reported for each aqueous sample?	☑		
Are percent solids calculations present for soils/sediments?	☑		not validated just results
Are preparation dates present on the sample preparation logs/bench sheets?	☑		

NOTE:
Digestion/Distillation log must include weights, volumes, and dilutions used to obtain the reported results.

A.1.8.2 Is the analytical instrument real-time printouts present for:

ICP-AES?	☑		
ICP-MS?	☑		
Mercury?	☑		
Cyanide?			☑

Are all laboratory bench sheets and instrument raw data printouts necessary to support all sample analyses and QC operations:

Legible?	☑		
Properly labeled?	☑		

Are all field samples, QC samples and field QC samples present on:

Digestion/Distillation log?	☑		
Instrument Printouts?	☑		

ACTION:
If no for any of the above questions in Section A.1.8.1 and Section A.1.8.2, write Telephone Record Log and contact TOPO/PO for re-submittal from the laboratory.

		YES	NO	N/A
A.1.9	**Technical Holding Times**: (Aqueous and soil samples) (Examine sample Traffic Reports and digestion/distillation logs to determine the holding time from the sample collection date to the sample preparation date.)			
A.1.9.1	Cyanide distillation(14 days)exceeded?	_	[✓]	_
	Mercury analysis(28 days) exceeded?	_	[✓]	_
	Other Metals analysis(180 days)exceeded? ___	___	[✓]	_

ACTION:
If yes, reject (R) and red-line non-detects and flag as estimated (J)results ≥ MDL even if sample(s) was preserved properly.

NOTE:
In addition to qualifying the data, a list of all samples and analytes which exceeded the holding times must be prepared. Report for each sample the number of days that were exceeded. (Subtract the sample collection date from the sample preparation date). Attach this list to the data review narrative.

A.1.9.2	Is pH of aqueous samples for:			
	Metals Analysis ≤ 2?	[✓]	___	___
	Cyanide Analysis ≥ 12?	[_]	_	[✓]

ACTION:
If no for any of the above, flag non-detects as "R" and detects as "J".

A.1.9.3	Is the cooler temperature ≤ 10 C°?	[✓]	_	_

ACTION:
If cooler temperature is >10 °C , flag non-detects as "UJ" and detects as "J".

A.1.10 **Final Data Correctness - Form I**

A.1.10.1 Are Form I's for all samples

	YES	NO	N/A
present and complete?	[✓]	___	___

ACTION:
If no, prepare Telephone Record Log and contact CLP PO/TOPO for submittal from the laboratory.

A.1.10.2 Verify there are no calculation and transcription errors in the results reported on Form I's. Circle on each Form I all results that are incorrect.

Is the calculation error less than 10% of the correct result?	[✓]	_	_
Are results on Form I's reported in correct units (ug/L for aqueous and MG/KG for soils)? ug/kg per project SAP	[✓]	___	___
Are results on Form I'S reported by correct significant figures?	[✓]	___	___
Are soil sample results on Form I's corrected for percent solids?	[___]	___	✓
Are all "less than MDL" values reported by the ~~CRQLs~~ LOD's and coded with "U"?	[✓]	___	___
Are values less than the ~~CRQLs~~ LOQ's but greater than or equal to the MDLs flagged with "J"? per project SAP	[✓]	___	___
Are appropriate contractual quality control and Method qualifiers used?	[✓]	___	___

ACTION:
If no for any of the above questions, prepare Telephone Record Log, and contact CLP PO/TOPO for corrected data.

A.1.10.3 Do EPA sample identification numbers and the corresponding laboratory sample identification numbers match on the Cover Page, Form I's and in the raw data? [✓] ___ ___

Was a brief physical description

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Tuesday, April 19, 2011 1:13 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: Resubmission Request - Vieques SWMU 6 SDG 3501997
Attachments: Metals RD 3501997.pdf

Good afternoon.
Revised pages for the 3501997 metals raw data attached.
I will send an email later today with a list of SDGs that have been revised and posted to our website.
Please contact me with any questions or concerns.
Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Saturday, April 16, 2011 2:15 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: Resubmission Request - Vieques SWMU 6 SDG 3501997
Importance: High

Dear John,

I have a resubmission request for the SDG noted above for the ICP-AES and FIMS metals data package. The raw data included in the package is for SDG 3501977 not SDG 3501997. The raw data included in the data package is clearly labeled 3501997 at the bottom of each page, however the data included is identical to that included in SDG 3501977. The preparation logs included are also from SDG 3501977. This raw data will need to be sent to me as soon as possible so that I can wrap up the calculations on this SDG. My mailing address is below. Don't hesitate to contact me if you have any questions! Thank you.

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

137 Royallprairie Lane
O'Fallon, MO 63368

CH2M HILL VIEQUES CTO-111 **METALS CALCULATIONS**

SDG 3501997/K0205/K0205D

ICP - AES	
SAMPLE ID	VWW06-SW016-0211
ANALYTE	magnesium
Lab Value CONCENTRATION (ug/L)	1690000
AMOUNT FROM RAW DATA (ug/L)	169000
SAMPLE SIZE (ml)	50
FINAL VOLUME (L)	50
DILUTION FACTOR	10
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	1690000

Raw data missing from SDG.

FIMS	
SAMPLE ID	VWW06-SW017-0211
ANALYTE	mercury
Lab Value CONCENTRATION (ug/L)	0.053J
AMOUNT FROM RAW DATA (ug/L)	0.053J
SAMPLE SIZE (ml)	25
FINAL VOLUME (ml)	25
DILUTION FACTOR	1
DRYNESS FACTOR	1
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	0.053 ~~#DIV/0!~~

Resubs Received 4/19/11 JC

✓

ICP-MS	
SAMPLE ID	VWW06-SW002-0211
ANALYTE	cobalt
Lab Value CONCENTRATION (ug/L)	37.5
AMOUNT FROM RAW DATA (ug/L)	0.075
SAMPLE SIZE (ml)	50
FINAL VOLUME (ml)	50
DILUTION FACTOR	500
DRYNESS FACTOR	1
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	37.5

	YES	NO	N/A
of the samples before and after digestion given on the Form I's?	[___]	✓	___
Was any sample result outside the mercury/cyanide calibration range or the ICP-AES/ICP-MS linear range diluted and noted on the Form I?	[___]	✓	___

ACTION:
If no for any of the above, note under the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

Dilutions were performed but DL info is not included on Form 1. A DL was added to highest DL ID.

A.1.11 **Initial Calibration**

A.1.11.1	Is a record of at least 2 point (A blank and a standard)calibration present for ICP-AES analysis?	[✓]	___	___
	Is a record of at least 2 point (a blank and a standard)calibration present for ICP-MS analysis?	[✓]	___	___
	Is a record of at least 5 point calibration (a blank & 4 standards)present for Hg analysis?	[✓]	___	___
	Is a record of at least 4 point calibration (a blank & 4 standards)present for cyanide?	[___]	___	✓

ACTION:
If incomplete or no initial calibration was performed, reject (R) and red-line the associated data (detects & non-detects).

	Is one initial calibration standard at the CRQL level for cyanide and mercury?	[✓]	___	___

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the Data Review Narrative.

A.1.11.2	Is the curve correlation coefficient $\geq$ 0.995 for:			

		YES	NO	N/A
	Mercury Analysis?	[✓]	___	___
	Cyanide Analysis?	[___]	___	✓
	ICP-AES (more than 2 point Calib.)?	[___]	___	✓
	ICP-MS (more than 2 point calib.)?	[✓]	___	✓ x1 corr SAC 4/4/11

ACTION:
If no, qualify the associated sample results ≥ MDL as estimated "J" and non-detects as "UJ".

NOTE:
The correlation coefficient shall be calculated by the data validator using standard concentrations and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.12 **Initial and Continuing Calibration Verification- Form IIA**

A.1.12.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for ICP-AES and ICP-MS when both these methods were used for the same analyte?	[___]	___	___

ACTION:
If no for any of the above, prepare a Telephone Record Log and contact PO/TOPO for re-submittal from the laboratory.

A.1.12.2	Was a Continuing Calibration Verification performed every 10 samples or every 2 hours whichever is more frequent?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.12.3	Was an ICV or a mid-range standard distilled and analyzed with each batch of cyanide samples?	[___]	___	✓

280

	YES	NO	N/A

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative and qualify results ≥ MDL as estimated (J).

A.1.12.2 Circle on each Form IIA all percent recoveries that are outside the contract windows.

Are ICV/CCVs within control limits for:

Metals - 90-110%R?	[✓]	___	___
Hg - 80-120%R?	[✓]	___	___
Cyanide - 85-115%R?	[___]	___	✓

ACTION:
If no, qualify all samples between a previous technically acceptable CCV standard and a subsequent technically acceptable CCV standard as follows as follows:

Qualify as estimated (J) all detects and non-detects, if the ICV/CCV %R is between 75-89%(65-79% for Hg; 70-84% for CN). Qualify only positive results(≥ MDL) as "J" if the ICV/CCV %R is between 111-125%(121-135% for Hg;116-130% for CN). Reject (R) and red-line only
detects if the recovery is greater than 125% (135% for Hg; 130% for CN). Reject (R) and red-line all associated results (hits and non-detects)if the recovery is less than 75%(65% for Hg;70% for CN).

NOTE:
For ICV that does not fall within the acceptance limits, qualify all samples reported from the analytical run.

A.1.12.3 Was the distilled ICV or mid-range standard for cyanide within acceptance limits (85-115%)? [___] ___ ✓

ACTION:
If no, Qualify all cyanide results ≥ MDL as "J".

A.1.13 **CRQL Standard Analysis - Form IIB**

A.1.13.1 For each ICP-AES run, was a CRI

281

	YES	NO	N/A
(CRQL or MDL when MDL > CRQL) standard analyzed? (Note:CRI is not required for Al, Ba, Ca, Fe, Mg, Na and K.)	[___]	___ ✓	___
For each ICP-MS run, was a CRI (CRQL or MDL when MDL > CRQL) standard analyzed for each mass/isotope used for the analysis? Lab sent info for ICP-MS LLQ Std.	[✓]	___	___ ___
For each mercury run, was a CRQL standard analyzed? * Digested Std at RL was analyzed as part of above. meets +/-70%	[___]	*✓	___
For each cyanide run, was a CRQL standard analyzed?	[___]	___	✓

ACTION:
If no for any of the above, write this deficiency in the Contract Problems/ Non-Compliance Section of the Data Review Narrative, inform CLP PO and flag results in the affected ranges (detects <2xCRQL)as J and non-detects UJ.

Sample required by SW-846 at beginning of runs only.

The affected ranges are:
ICP-AES Analysis - *True Value ± CRQL
ICP-MS Analysis - *True Value ± CRQL
Mercury Analysis - *True Value ± CRQL
Cyanide Analysis - *True Value ± CRQL
* True value of the CRQL Standard

A.1.13.2 Was a CRQL standard analyzed after the ICV/ICB, before the final CCV/CCB and once every 20 analytical samples in the analytical run for each analysis? [___] ___✓ ___✓

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the "Data Review Narrative".

A.1.13.3 Circle on each Form IIB all percent recoveries that are outside the acceptance windows.

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Wednesday, April 13, 2011 11:08 AM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU6

Jackie:

Good afternoon.

Per our QAO:
The mercury procedures were reviewed. The calibration curve is digested with every batch analyzed. The low cal standard is at 0.2ug/L which is the Reporting Limit.
PEL does not check an LLQC sample regularly at this time but as the low cal standard is at the RL and carried through the entire process any raw data from a cal curve could be used to verify an LLQC.
Using the Raw Data from the regular Hg analysis for SDG 3501977 the recovery for the low cal standard, 0.2ug/L, yielded a 78.3% recovery, meeting the +/-30% criteria.

For example on SDG 3501977, CS1 data can be found in the metals raw data section on page 4531.

Please let me know if you have any questions or concerns.

Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:35 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU6

Good Afternoon John,

I have a request regarding the mercury analysis. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects all 5 SDGs. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. If the standards are there and I am just missing them let me know! Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

Jacqueline Cleveland

From: Edward Lawler [Mitkem] [elawler@mitkem.com]
Sent: Wednesday, April 13, 2011 1:28 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020
Attachments: PEL_VIEQUES-LLICV.metals.xls

Jackie—

Attached is an Excel file containing all the Low Level ICVs (LLICVs) for the Vieques SDGs for Method 6020.

This is right out of our database. There is a separate section of the spreadsheet for each ICP/MS run, also identifying which Mitkem SDGs were analyzed in that run.

These data probably include extra elements, which were included for other samples analyzed in the same run.

Please let me know if you have any questions, or need any additional information.

--Ed

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 6:27 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Thanks Ed,

I will wait for the summary pages!

Jackie

From: Edward Lawler [Mitkem] [mailto:elawler@mitkem.com]
Sent: Tuesday, April 12, 2011 4:03 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Hi Jackie—

That check standard is included in all of the SDGs. We call it the Low Level ICV (or LLICV). Our CLP-type inorganics data reporting software doesn't have a form to report these on, so they are included in the raw data for each SDG, but not on the reporting forms.

For example, in Mitkem SDG K0204, the LLICV is listed as the 10th run on page 0064, and the raw data for this run are on page 0092—but this data is somewhat difficult to follow.....

We are working on something to get you the summaries of %recoveries, which I will hopefully have to you tomorrow.

--Ed

284

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:25 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU 6 Metals by 6020

Good Afternoon Ed,

I am doing data validation for CH2M HILL for the Vieques SWMU 6 data for which you were subcontracted to perform the 6020 metals analyses. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects Work Order #s K0204, K0225, K0205, K0201 & K0215. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

K0204 X1_110223A

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Arsenic	2.30064728	2	2.30064728	2.3	2	0.19	0.5	2	115.03%		70	130
A	Y	Chromium	2.01545733	2	2.01545733	2	2	0.16	0.5	2	100.77%		70	130
A	Y	Selenium	5.66130075	5	5.66130075	5.7	5	0.15	0.5	5	113.23%		70	130

K0201 X1_110216B

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Aluminum	21.0027562	20	21.0027562	21	20	2.9	5	20	105.01%		70	130
A	Y	Antimony	2.12426401	2	2.12426401	2.1	2	0.2	0.2	2	106.21%		70	130
A	Y	Arsenic	2.00593914	2	2.00593914	2	2	0.19	0.5	2	100.30%		70	130
A	Y	Barium	10.0122643	10	10.0122643	10	10	1.3	3	10	100.12%		70	130
A	Y	Beryllium	1.00140666	1	1.00140666	1	1	0.072	0.2	1	100.14%		70	130
A	Y	Cadmium	1.00829914	1	1.00829914	1	1	0.084	0.2	1	100.83%		70	130
A	Y	Calcium	472.76306	500	472.76306	470	500	24	38	500	94.55%	J	70	130
A	Y	Chromium	2.03706028	2	2.03706028	2	2	0.16	0.5	2	101.85%		70	130
A	Y	Cobalt	1.06535199	1	1.06535199	1.1	1	0.024	0.1	1	106.54%		70	130
A	Y	Copper	2.15205123	2	2.15205123	2.2	2	0.23	0.6	5	107.60%	J	70	130
A	Y	Iron	192.148667	200	192.148667	190	200	14	40	200	96.07%	J	70	130
A	Y	Lead	0.97907404	1	0.97907404	0.98	1	0.068	0.2	1	97.91%	J	70	130
A	Y	Magnesium	527.600786	500	527.600786	530	500	7.8	12	500	105.52%		70	130
A	Y	Manganese	5.4470818	5	5.4470818	5.4	5	0.83	1	5	108.94%		70	130
A	Y	Nickel	1.0502218	1	1.0502218	1.1	1	0.17	0.25	1	105.02%		70	130
A	Y	Potassium	484.529478	500	484.529478	480	500	14	40	500	96.91%	J	70	130
A	Y	Selenium	5.36275801	5	5.36275801	5.4	5	0.15	0.5	5	107.26%		70	130
A	Y	Silver	1.01190753	1	1.01190753	1	1	0.022	0.05	1	101.19%		70	130
A	Y	Sodium	487.672118	500	487.672118	490	500	33	50	500	97.53%	J	70	130
A	Y	Thallium	0.9840832	1	0.9840832	0.98	1	0.048	0.1	1	98.41%	J	70	130
A	Y	Vanadium	5.4149342	5	5.4149342	5.4	5	0.61	1	5	108.30%		70	130
A	Y	Zinc	5.54426374	5	5.54426374	5.5	5	0.73	1	5	110.89%		70	130

K0201, K0205 X1_110217B

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	2.07949727	2	2.07949727	2.1	2	0.2	0.2	2	103.97%		70	130
A	Y	Arsenic	2.00792532	2	2.00792532	2	2	0.19	0.5	2	100.40%		70	130
A	Y	Cadmium	0.9580971	1	0.9580971	0.96	1	0.084	0.2	1	95.81%	J	70	130
A	Y	Chromium	1.84630224	2	1.84630224	1.8	2	0.16	0.5	2	92.32%	J	70	130
A	Y	Cobalt	0.98179571	1	0.98179571	0.98	1	0.024	0.1	1	98.18%	J	70	130
A	Y	Copper	1.81974453	2	1.81974453	1.8	2	0.23	0.6	5	90.99%	J	70	130
A	Y	Lead	0.95434051	1	0.95434051	0.95	1	0.068	0.2	1	95.43%	J	70	130
A	Y	Silver	0.97534637	1	0.97534637	0.98	1	0.022	0.05	1	97.53%	J	70	130

K0215, K0225 **X1_110222A**

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	1.8964567	2	1.8964567	1.9	2	0.2	0.2	2	94.82%	J	70	130
A	Y	Arsenic	2.13301722	2	2.13301722	2.1	2	0.19	0.5	2	106.65%		70	130
A	Y	Barium	10.7561986	10	10.7561986	11	10	1.3	3	10	107.56%		70	130
A	Y	Beryllium	1.03423982	1	1.03423982	1	1	0.072	0.2	1	103.42%		70	130
A	Y	Cadmium	1.04382134	1	1.04382134	1	1	0.084	0.2	1	104.38%		70	130
A	Y	Chromium	1.87146555	2	1.87146555	1.9	2	0.16	0.5	2	93.57%	J	70	130
A	Y	Cobalt	1.06305979	1	1.06305979	1.1	1	0.024	0.1	1	106.31%		70	130
A	Y	Copper	2.20898143	2	2.20898143	2.2	2	0.23	0.6	5	110.45%	J	70	130
A	Y	Iron	195.167776	200	195.167776	200	200	14	40	200	97.58%	J	70	130
A	Y	Lead	1.0698727	1	1.0698727	1.1	1	0.068	0.2	1	106.99%		70	130
A	Y	Nickel	1.01332509	1	1.01332509	1	1	0.17	0.25	1	101.33%		70	130
A	Y	Selenium	5.56241436	5	5.56241436	5.6	5	0.15	0.5	5	111.25%		70	130
A	Y	Silver	1.00087559	1	1.00087559	1	1	0.022	0.05	1	100.09%		70	130
A	Y	Thallium	1.07403596	1	1.07403596	1.1	1	0.048	0.1	1	107.40%		70	130
A	Y	Vanadium	5.44821072	5	5.44821072	5.4	5	0.61	1	5	108.96%		70	130
A	Y	Zinc	5.63784043	5	5.63784043	5.6	5	0.73	1	5	112.76%		70	130

	YES	NO	N/A
Is the CRQL standard within control limits for:			
Metals(ICP-AES/ICP-MS)- 70 - 130%?	[✓]	___	___
Mercury- 70 - 130%? see note at * on previous page	[✓]	___	___
Cyanide - 70 - 130%?	[___]	___	✓

ACTION:
If no, flag detects <2xCRQL as "J" and non-detects as "UJ" if the CRQL standard recovery is between 50-69%. Flag(J) only detects <2xCRQL if the recovery is between 131% and ≤180%. If the recovery is less than 150%, reject(R) and red-line non-detects and detects < 2xCRQL, and flag (J) detects between 2xCRQL and ICV/CCV. Reject and red-line only detects <2xCRQL and flag (J)detects ≥ 2xCRQL but < ICV/CCV if the recovery is > 180%.

NOTE:
1. Qualify all field samples analyzed between a previous technically acceptable analysis of the CRQL standard and a subsequent acceptable analysis of the CRQL standard
2. Flag (J) or reject (R) only the final sample results on Form I's when Sample raw data are within the affected ranges and the CRQL standard is outside the acceptance windows.
3. The samples and the CRQL standard must be analyzed in the same analytical run.

A.1.14 Initial and Continuing Calibration Blanks - Form III

A.1.14.1	Present and complete for all the instruments used for the metals and cyanide analyses?	[✓]	___	___
	Was an initial Calibration Blank analyzed after ICV?	[✓]	___	___
	Was a continuing Calibration Blank analyzed after every CCV and every 10 samples or every 2 hours, whichever is more frequent?	[✓]	___	___
	Were the ICB & CCB values ≥ MDL but < CRQL reported on Form III and flagged "J" by			

		YES	NO	N/A
	using MDLs from direct analysis(Preparation Method "NP1")? (Check Form III against the raw data)	[✓]	___	___

OR B—

ACTION:
If no, inform CLP PO/TOPO and make a note in the Contract-Problems/Non-Compliance Section of the "Data Review Narrative".

A.1.14.2 Circle with red pencil on each Form III all Calib. Blank values that are:

≥ MDL but ≤ ~~CRQL~~ LOD

> ~~CRQL~~ LOD

(CRQL = LOD per CH2M Hill SAP (DOD QSM 4.1))

A.1.14.2.1	When MDL < ~~CRQL~~ LOD, is any Calib. Blank value ≥ MDL but ≤ ~~CRQL~~ LOD?	✓	[___]	___

ACTION:
If yes, change sample results ≥ MDL but ≤ CRQL to the CRQL with a "U". Do not qualify non-detects.

A.1.14.2.2	When MDL < CRQL, is any Calib. Blank value > CRQL?	___	[✓]	___

ACTION:
If yes, reject (R) and red line the associated sample results > CRQL but <ICB/CCB Blank Result. Flag as "J" detects > ICB/CCB blank value but < 10xICB/CCB value. Change the sample results ≥ MDL but ≤ the CRQL to CRQL with a "U".

A.1.14.2.3	Is any Calibration Blank value below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated all associated sample results ≥ CRQL but <10xCRQL.

NOTE:

1. For ICB that does not meet the technical QC Criteria, apply the action to all samples

	YES	NO	N/A

reported from the analytical run.
2. For CCBs that do not meet the technical QC criteria, apply the action to all samples analyzed between a previous technically acceptable analysis of CCB and a subsequent technically acceptable analysis of the CCB in the analytical run.,

A.1.15 **Preparation Blank - FORM III**

NOTE: The Preparation Blank for mercury is the same as the calibration blank.

A.1.15.1 Was one Preparation Blank prepared with and analyzed for:

Each Sample Delivery Group (SDG)?	[✓]	___	___
Each batch of the SDG samples digested/distilled?	[✓]	___	___
Each matrix type?	[✓]	___	___
All instruments used for metals and cyanide analyses?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the associated positive data <10xMDL for which the Preparation Blank was not analyzed.

NOTE:
If only one blank was analyzed for more than 20 samples, then the first 20 samples analyzed are not estimated(J), but all additional samples must be qualified (J).

CRQL = LOD per DOD QSM 4.1

A.1.15.2 Circle with red pencil on each Form III all Prep. Blank values that are:

≥ MDL but ≤ CRQL, and

> CRQL

A.1.15.2.1 When MDL < CRQL, is any preparation blank value ≥ MDL but ≤ CRQL?	✓	[___]	___

ACTION:
If yes, change sample result ≥ MDL

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

Total

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	11.6	J	29.2	J	100	U	100	U	18.6	U	P
Barium	0.377	J	10	U	10	U	10	U	0.265	J	P
Beryllium	0.25	J	0.156	J	0.122	J	0.129	J	0.24	U	P
Calcium	100	U	100	U	100	U	100	U	63.8	J	P
Iron	23.5	J	33.8	J	9.3	J	11.6	J	11	U	P
Magnesium	12.6	J	28.4	J	100	U	100	U	12.2	J	P
Manganese	-0.437	J	-0.66	J	-0.644	J	-0.629	J	0.7	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.074	U	CV
Nickel	4.1	U	4.1	U	4.1	U	4.1	U	1.86	U	P
Potassium	82.6	J	500	U	500	U	500	U	143	U	P
Selenium	9	U	9	U	9	U	9	U	8.2	U	P
Sodium	300	U	300	U	300	U	300	U	187	J	P
Thallium	10	U	-5.35	J	10	U	-5.54	J	8.8	U	P
Vanadium	9	U	9	U	9	U	9	U	0.88	U	P
Zinc	20	U	20	U	20	U	20	U	8	U	P

NQ NQ NQ NQ NQ

none assoc

ICB IDs: CV= ICB948656, P= ICB960936

CCB1 IDs: CV= CCB948658, P= CCB960941

CCB2 IDs: CV= CCB948670, P= CCB960892

CCB3 IDs: CV= CCB948682, P= CCB960904

✓ flag results U at LOD all >MDL ≤ LOD in assoc. field samples

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Total

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C	5	C	6	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U			P
Barium			10	U	10	U	0.261	J	See ICB		P
Beryllium			3.65	U	3.65	U	0.158	J	See ICB		P
Calcium			100	U	100	U	100	U			P
Iron			40	U	9.74	J	11.6	J	See ICB		P
Magnesium			100	U	100	U	100	U			P
Manganese			-0.707	J	-0.77	J	-0.59	J	NQ		P
Mercury			0.2	U							CV
Nickel			4.1	U	4.1	U	4.1	U			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Sodium			300	U	194	J	300	U	NQ		P
Thallium			10	U	-4.42	J	-5.21	J	NQ		P
Vanadium			9	U	9	U	9	U			P
Zinc			20	U	20	U	20	U			P

SW016 SW016DL

none assoc

none assoc

ICB IDs:

CCB1 IDs: CV= CCB948694, P= CCB960905

CCB2 IDs: P= CCB960942

CCB3 IDs: P= CCB961057

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg): Total

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 7	C	8	C	9	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U			P
Barium			10	U	0.23	J	10	U	NQ		P
Beryllium			3.65	U	3.65	U	3.65	U			P
Calcium			100	U	100	U	100	U			P
Iron			9.28	J	9.05	J	40	U	See ICB		P
Magnesium			100	U	9.82	J	100	U			P
Manganese			-0.62	J	-0.635	J	-0.675	J	NQ		P
Mercury											CV
Nickel			4.1	U	4.1	U	4.1	U			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Sodium			300	U	266	J	226	J	NQ		P
Thallium			-4.58	J NQ	10	U	10	U			P
Vanadium			9	U	9	U	9	U			P
Zinc			20	U	20	U	20	U			P

SW017
SW017DL
SW001
001DL
002
002DL
014

None assoc

SW014DL
015
015DL

ICB IDs:

CCB1 IDs: P= CCB961058

CCB2 IDs: P= CCB961070

CCB3 IDs: P= CCB961071

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg): Total

Analyte	Initial Calib Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 10	C	C	C	Prepa-ration Blank	C	M
Aluminum			100	U					P
Barium			0.272	J	NQ				P
Beryllium			3.65	U					P
Calcium			100	U					P
Iron			6.96	J					P
Magnesium			100	U					P
Manganese			-0.665	J	NQ				P
Mercury									CV
Nickel			4.1	U					P
Potassium			500	U					P
Selenium			9	U					P
Sodium			300	U					P
Thallium			-6.62	J	NQ				P
Vanadium			9	U					P
Zinc			20	U					P

SW0140L
↓ 015
↓ 015DL

ICB IDs:

CCB1 IDs: P= CCB961083

CCB2 IDs:

CCB3 IDs:

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

Dissolved per 4/4/11 T & D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	21.3	J	22.3	J	100	U	100	U	18.6	U	P
Barium	0.347	J	10	U	10	U	10	U	0.44	U	P
Beryllium	0.328	J	3.65	U	0.127	J	3.65	U	0.24	U	P
Calcium	100	U	100	U	100	U	100	U	78	U	P
Iron	31.2	J	21.9	J	40	U	40	U	11	U	P
Magnesium	19.2	J	21.6	J	100	U	100	U	19.6	U	P
Manganese	-0.401	J	-0.808	J	-0.848	J	-0.802	J	0.7	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.074	U	CV
Nickel	4.1	U	-1.33	J	-1.54	J	-1.02	J	1.86	U	P
Potassium	98.8	J	500	U	500	U	500	U	143	U	P
Selenium	9	U	9	U	9	U	9	U	8.2	U	P
Sodium	300	U	300	U	300	U	300	U	300	U	P
Thallium	4.68	J	10	U	6.22	J	10	U	8.8	U	P
Vanadium	9	U	9	U	9	U	9	U	0.88	U	P
Zinc	20	U	20	U	20	U	20	U	8	U	P

none assoc.

(NQ = all results + >LOD>)

ICB IDs: CV= ICB948656, P= ICB961289

CCB1 IDs: CV= CCB948658, P= CCB961294

CCB2 IDs: CV= CCB948670, P= CCB961296

CCB3 IDs: CV= CCB948682, P= CCB961297

√ flag U at LOD in all field samples if <LOD< >MDL.

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

F&H D JAC 4/14/11

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C	5	C	6	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	3.65	U	3.65	U			P
Calcium			122	=	119	=	99.6	J			P
Iron			40	U	40	U	40	U			P
Magnesium			100	U	100	U	100	U			P
Manganese			-0.673	J	-0.706	J	-0.699	J			P
Mercury			0.2	U							CV
Nickel			4.1	U	4.1	U	4.1	U			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	4.87	J	9	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	10	U	10	U			P
Vanadium			9	U	9	U	9	U			P
Zinc			20	U	20	U	20	U			P

none assoc.

ICB IDs:

CCB1 IDs: CV= CCB948694, P= CCB961309

CCB2 IDs: P= CCB961310

CCB3 IDs: P= CCB961320

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

~~FBD~~ D MC 4/4/11

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 7	C	8	C	9	C	Prepa-ration Blank	C	M
Aluminum			15.3	J	100	U	100	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	3.65	U	3.65	U			P
Calcium			100	U	100	U	100	U			P
Iron			18	J	40	U	40	U			P
Magnesium			100	U	100	U	100	U			P
Manganese			-0.68	J	-0.769	J	-0.806	J			P
Mercury											CV
Nickel			-1.45	J	-2.12	J	-1.72	J			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	10	U	10	U			P
Vanadium			9	U	0.526	J	9	U			P
Zinc			20	U	20	U	20	U			P

NQ NQ NQ

none assoc SW0160 016DL more assoc

ICB IDs:

CCB1 IDs: P= CCB961446

CCB2 IDs: P= CCB961465

CCB3 IDs: P= CCB961477

✓ flag U @ LOD all >MDL < LOD in field samples

170311 1710

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

~~I & D~~ D SMC 4/4/11

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 10	C	11	C		C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U					P
Barium			10	U	10	U					P
Beryllium			3.65	U	3.65	U					P
Calcium			100	U	100	U					P
Iron			40	U	9.23	J					P
Magnesium			100	U	100	U					P
Manganese			-0.74	J	-0.752	J					P
Mercury											CV
Nickel			-2.24	J	-1.44	J					P
Potassium			500	U	500	U					P
Selenium			9	U	9	U					P
Sodium			300	U	300	U					P
Thallium			10	U	10	U					P
Vanadium			9	U	0.451	J	NQ				P
Zinc			20	U	20	U					P

none
xxxx

SW014
014DL
SW015
015DL

ICB IDs:

CCB1 IDs: P= CCB961490

CCB2 IDs: P= CCB961502

CCB3 IDs:

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Run 2

~~T&D~~ Δ QAC 4/4/11

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	12.7	J	29.6	J	100	U	100	U			P
Barium	0.238	J	10	U	10	U	10	U			P
Beryllium	0.258	J	0.135	J	3.65	U	3.65	U			P
Calcium	100	U	100	U	100	U	100	U			P
Iron	24.8	J	28.8	J	40	U	40	U			P
Magnesium	15.4	J	27.9	J	100	U	100	U			P
Manganese	-0.684	J	-0.887	J	-0.967	J	-0.967	J			P
Mercury											CV
Nickel	4.1	U	4.1	U	-1.07	J	4.1	U			P
Potassium	500	U	500	U	500	U	500	U			P
Selenium	9	U	5.7	J	7.04	J	9	U			P
Sodium	300	U	300	U	300	U	300	U			P
Thallium	10	U	10	U	10	U	10	U			P
Vanadium	9	U	9	U	9	U	0.71	J			P
Zinc	20	U	20	U	20	U	20	U			P

NO NO NO

none assoc

ICB IDs: P= ICB961756

CCB1 IDs: P= CCB961761

CCB2 IDs: P= CCB961763

CCB3 IDs: P= CCB961764

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

~~F&D~~ D MC 4/4/11

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C	5	C	6	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	3.65	U	3.65	U			P
Calcium			100	U	100	U	100	U			P
Iron			40	U	40	U	40	U			P
Magnesium			100	U	100	U	100	U			P
Manganese			-0.954	J	-0.931	J	-0.906	J	NQ		P
Mercury											CV
Nickel			-0.931	J	NQ 4.1	U	-1.17	J	NQ		P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	5.06	J	10	U			P
Vanadium			9	U	9	U	9	U			P
Zinc			20	U	20	U	20	U			P

SW016
SW016DL
SW017
SW017DL
SW001 ✓ TL

✓ none associated

SW001 DL
002
002 DL

ICB IDs:

CCB1 IDs: P= CCB961769

CCB2 IDs: P= CCB961780

CCB3 IDs: P= CCB961781

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06. CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3501997

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

~~T&D~~ D SAC 4/14/11

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 7	C		C		C	Prepa-ration Blank	C	M
Aluminum			100	U							P
Barium			10	U							P
Beryllium			3.65	U							P
Calcium			100	U							P
Iron			40	U							P
Magnesium			100	U							P
Manganese			-0.881	J							P
Mercury											CV
Nickel			4.1	U							P
Potassium			500	U							P
Selenium			9	U							P
Sodium			300	U							P
Thallium			4.42	J	NQ						P
Vanadium			9	U							P
Zinc			20	U							P

SW001DL
002
002DL

ICB IDs:

CCB1 IDs: P= CCB961793

CCB2 IDs:

CCB3 IDs:

170311 1719

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Preparation Blank Matrix (soil/water): WATER Method Blank ID: MB-57448

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.306	B	0.255	B	0.438	B	0.200	U	0.251	B	MS
Arsenic	0.260	B	0.190	U	0.240	B	0.190	U	0.500	U	MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U	0.200	U	MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U	1.000	U	MS
Cobalt	0.059	B	0.024	U	0.047	B	0.024	B	0.200	U	MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U	0.500	U	MS
Lead	0.068	U	0.068	U	0.068	U	0.068	U	0.200	U	MS
Silver	0.022	U	0.029	B	0.049	B	0.023	B	0.050	U	MS

NQ NQ NQ NQ NQ NQ NQ NQ NQ NQ

see ICB see ICB see ICB

EB01 EB02

SW014 1:100 all SW015 1:100 Sb Cd Pb Ag

SW016 1:100 Sb Pb

✓ flag U at LOD all > MDL ≤ LOD in field samples

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 4	C	5	C	6	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.190	U	0.190	U	0.190	U			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Cobalt			0.042	B	0.035	B	0.050	B	see ICB		MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.068	U	0.097	B	0.117	B	NQ		MS
Silver			0.044	B	0.036	B	0.057	B	NQ		MS

NQ NQ NQ

SW0116 1:100 Sb Pb

SW015 1:500 As Co Cr Cu
SW016 1:500 As Cd Co Cr Cu Ag

SW0171:500 As Co Cr Cu

SW001 1:500 As Cd Co Cr Cu Ag
002 ↓ Sb As Cd Co Cr Cu Ag

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.274	B	0.190	U	0.207	B			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Cobalt			0.042	B	0.042	B	0.033	B			MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.109	B	0.107	B	0.094	B			MS
Silver			0.044	B	0.043	B	0.026	B			MS

See ICB

See ICB

NQ

NQ

SW001 1:500 002

none

none

none

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 10 11 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U					MS
Arsenic			0.249	B	NQ						MS
Cadmium			0.084	U	0.084	U					MS
Chromium			0.160	U							MS
Cobalt			0.061	B	NQ						MS
Copper			0.230	U							MS
Lead			0.090	B	NQ ✓		0.068	U			MS
Silver			0.062	B	0.040	B	NQ				MS

x1com JHC 4/4/11

none

SW017 1:100 Sb Cd Pb Ag

SW001 1:100 Sb Pb

SW002 1:100 Pb

✓ flag U @ LOD all >MDL ≤LOD in field samples

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Preparation Blank Matrix (soil/water): WATER Method Blank ID: MB-57448

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.306	B	0.255	B	0.438	B	0.200	U	0.251	B	MS
Arsenic	0.260	B	0.190	U	0.240	B	0.190	U	0.190	U	MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U	0.084	U	MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U	0.160	U	MS
Cobalt	0.059	B	0.024	U	0.047	B	0.024	B	0.024	U	MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U	0.230	U	MS
Lead	0.068	U	0.068	U	0.068	U	0.068	U	0.068	U	MS
Silver	0.022	U	0.029	B	0.049	B	0.023	B	0.022	U	MS

EB01

SW014 1:100 all
SW015 Sb, Cd, Pb, Ag

none

U @ LOD all > MDL < LOD in field samples

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 4	C	5	C	6	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.190	U	0.190	U	0.190	U			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Cobalt			0.042	B	0.035	B	0.050	B	See ICB		MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.068	U	0.097	B	0.117	B	NQ		MS
Silver			0.044	B	0.036	B	0.057	B	NQ		MS

none

SW016 1:500 (As Cd Co Cr Cu Ag

SW017 1:500 As Co Cr Cu

SW001 1:500 all but Pb

SW002 1:500 all but Pb

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.274	B	0.190	U	0.207	B			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Cobalt			0.042	B	0.042	B	0.033	B			MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.109	B	0.107	B	0.094	B			MS
Silver			0.044	B	0.043	B	0.026	B			MS

SW001 SW002 all but Pb ↓ none none none

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

X1_110217B

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 10 11 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U					MS
Arsenic			0.249	B	See ICB						MS
Cadmium			0.084	U	0.084	U					MS
Chromium			0.160	U							MS
Cobalt			0.061	B	See ICB						MS
Copper			0.230	U							MS
Lead			0.090	B	0.068	U					MS
Silver			0.062	B	0.040	B					MS

SW0116 1:100 Sb Pb

017 1:100 Sb Cd Pb Ag

001 1:100 Pb

002 1:100 Pb

		YES	NO	N/A
	but ≤ CRQL to CRQL with a "U".			
A.1.15.2.2	When the MDL ≤ CRQL, is any Preparation Blank value greater than its CRQL?	___	[✓]	___
	If yes, is the Prep. Blank value greater than the value of the associated Field Blank collected and analyzed with the SDG samples?	___	[___]	✓
	If yes, is the lowest concentration of that analyte in the associated samples less than 10 times the Preparation Blank value?	___	[___]	✓
	ACTION: If yes, reject (R) and red-line all associated sample results greater than the CRQL but less than the Prep.Blank value. Flag as "J" detects > Prep. Blank value but <10xPrep.Blank. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.			
	If the Prep. Blank value is less than the same analyte value in the Field Blank, do not qualify the sample results due to the Prep. Blank criteria.			
	NOTE: Convert soil sample result to mg/Kg on wet weight basis to compare with the soil Prep. Blank result on Form III.			
A.1.15.2.3	Is the Prep. Blank concentration below the negative CRQL?	___	[✓]	___
	ACTION: If yes, flag (J) all associated sample results less than 10xCRQL. Qualify non-detects as estimated (UJ).			
A.1.15.2.4	When the MDL is greater than the CRQL, is the preparation blank concentration on Form III greater than two times the MDL?	___	[___]	✓
	ACTION:			

		YES	NO	N/A
	If yes, reject (R) and red-line all positive sample results with sample raw data less than 10 times the Preparation Blank value.			
A.1.16	**ICP-AES/ICP-MS Interference Check Sample (ICS)- Form IV** **NOTE:** Not required for CN, Hg, Al, Ca, Fe and Mg.			
A.1.16.1	Present and complete?	[✓]	___	___
	Was ICS analyzed at the beginning and end of each analytical run, and once for every 20 analytical samples?	[✓]	___	___
	Was ICS analyzed at the beginning of the ICP-MS analytical run?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all sample results.			
A.1.16.2	**ICP-AES Method**			
A.1.16.2.1	**ICSA Solution:** For ICP-AES, are the ICSA "Found" analyte values within the control limits ± of CRQL of the true/established mean value?	[✓]	___	___
	If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSA Solution on Form IV?	[___]	___	✓
	ACTION: If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run: Flag (J) as estimated only sample results ≥MDL			

	YES	NO	N/A

for which the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag non-detects as "UJ" and detects as "J".

A.1.16.2.3 **ICSAB Solution**

For ICP-AES, are all analyte results in ICSAB within the control limits of 80-120 of the true/established mean value? [✓] ___ ___

If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSAB Solution on Form IV? [___] ___ ✓

ACTION:
If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79%, qualify sample results ≥ MDL as "J" and non-detects as "UJ". Reject (R) and red-line all sample results (detects & non-detects) for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only positive results.

A.1.16.3 **ICP-MS Method**

A.1.16.3.1 **ICSA Solution:**

For ICP-MS, are the ICSA "Found" analyte values within the control limits of ±CRQL of the true/established mean value? [✓] ___ ___

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated only sample results ≥ MDL if the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag the associated sample detects as "J" and non-detects as "UJ".

		YES	NO	N/A
A.1.16.3.3	ICSAB Solution For ICP-MS, are all analyte results in ICSAB within the control limits of 80-120% of the true/established mean value, whichever is greater?	[✓]	___	___

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79% flag (J) as estimated the associated sample results ≥ MDL. Reject (R) and red-line those all sample detects and non-detects for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only detects (≥ MDL).

A.1.17 Spiked Sample Recovery: Pre-Digestion/Pre-Distillation)-Form V A

Note: Not required for Ca, Mg, K, and Na (both matrices); Al and Fe (soil only)

		YES	NO	N/A
A.1.17.1	Was Matrix Spike analysis performed:			
	For each matrix type?	[✓]	___	___
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each concentration range (i.e., low, med., high)?	[✓]	___	___
	For each analytical Method (ICP-AES, ICP-MS, Hg, CN) used?	[✓]	___	___
	Was a spiked sample prepared and analyzed with the SDG samples?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the positive data for which a spiked sample was not analyzed.

NOTE:
If more than one spiked sample were analyzed for one SDG, then qualify the associated data based on the worst spiked sample analysis.

		YES	NO	N/A
A.1.17.2	Was a field blank or PE sample used for the spiked sample analysis?	___	[✓]	___
	ACTION: If yes, flag (J) as estimated positive data of the associated SDG samples for which field blank or PE sample was used for the spiked sample analysis.			
A.1.17.3	Circle on each Form VA all spike recoveries that are outside the control limits (75-125%) that have sample concentrations less than four times the added spike concentrations.			
	Are all recoveries within the control limits when sample concentrations are less than or equal to four times the spike concentrations?	[___]	✓	___
	NOTE: Disregard the out of control spike recoveries for analytes whose concentrations are greater than or equal to four times the spike added.			
	Are results outside the control limits (75-125%) flagged with Lab Qualifier "N" on Form I's and Form VA?	[✓]	___	___
	ACTION: If no for any of the above, write in the Contract - Problems/Non-Compliance Section of the Data Review Narrative.			
A.1.17.4	**Aqueous** SW0116 Total SW0116 Dissolved			
	Are any spike recoveries:			
	(a) less than 30%? due to abundance - Na	✓	[___]	___
	(b) between 30-74%?	✓	[___]	___
	(c) between 126-150%?	✓	[___]	___
	(d) greater than 150%?	___	[✓]	___
	ACTION: If the matrix spike recovery is less than 30%, reject (R) and red-line all associated aqueous data (detects & non-detects). If between 30-74%, qualify all associated aqueous data ≥ MDL as "J" and non-detects			

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Total

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	48200		428	J	50000	95.5		P
Barium	80 - 120	1470		33.9	J	1500	95.7		P
Beryllium	80 - 120	524		1.76	J	500	104.4		P
Calcium	-	584000		539000		50000	90		P
Iron	80 - 120	48000		201	J	50000	95.6		P
Magnesium	-	1670000		1620000		50000	100		P
Manganese	80 - 120	474		7.00	U	500	94.8		P
Mercury	80 - 120	1.80		0.0740	U	3.00	60	N	CV
Nickel	80 - 120	494		18.6	U	500	98.8		P
Potassium	-	583000		533000		50000	100		P
Selenium	80 - 120	591		99.6		500	98.3		P
Sodium	-								NR
Thallium	80 - 120	408		88.0	U	500	81.6		P
Vanadium	80 - 120	506		8.80	U	500	101.2		P
Zinc	80 - 120	545		80.0	U	500	109		P

JW

Flag in all FS

Comments:

170311 1719

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Total

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	48400		428	J	50000	95.9		P
Barium	80 - 120	1480		33.9	J	1500	96.4		P
Beryllium	80 - 120	532		1.76	J	500	106		P
Calcium	-	579000		539000		50000	80		P
Iron	80 - 120	48200		201	J	50000	96		P
Magnesium	-	1630000		1620000		50000	20	N	P
Manganese	80 - 120	479		7.00	U	500	95.8		P
Mercury	80 - 120	1.73		0.0740	U	3.00	57.7	N	CV
Nickel	80 - 120	494		18.6	U	500	98.8		P
Potassium	-	575000		533000		50000	84		P
Selenium	80 - 120	669		99.6		500	113.9		P
Sodium	-								NR
Thallium	80 - 120	425		88.0	U	500	85		P
Vanadium	80 - 120	510		8.80	U	500	102		P
Zinc	80 - 120	536		80.0	U	500	107.2		P

NQ MS OK
J/UJ

Comments:

170311 1719

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211MSDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Total

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	-								NR
Barium	-								NR
Beryllium	-								NR
Calcium	-								NR
Iron	-								NR
Magnesium	-								NR
Manganese	-								NR
Mercury	-								NR
Nickel	-								NR
Potassium	-								NR
Selenium	-								NR
Sodium	-	13900000		13800000		50000	0 D	N	P
Thallium	-								NR
Vanadium	-								NR
Zinc	-								NR

NQ Dilution

out due to abundance

Comments:

170311 1719

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211SDDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501997

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Total

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	-								NR
Barium	-								NR
Beryllium	-								NR
Calcium	-								NR
Iron	-								NR
Magnesium	-								NR
Manganese	-								NR
Mercury	-								NR
Nickel	-								NR
Potassium	-								NR
Selenium	-								NR
Sodium	-	13600000		13800000		50000	0 D	N	P
Thallium	-								NR
Vanadium	-								NR
Zinc	-								NR

NQ

out due to abundance

Comments:

170311 1739

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.: 350199703A

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.

Lab Code: PEL Case No.: _____ SAS No: _____ SDG No.: 3501997

Matrix: Water Level:(low/med) LOW

Total

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	487000.00		428.40	J	500000	97.3		P
Barium	80 - 120	14800.00		33.94	J	15000	98.2		P
Beryllium	80 - 120	5490.00		1.76	J	5000	109.7		P
Calcium	80 - 120	1000000.00		538776.01		500000	93.1		P
Iron	80 - 120	474000.00		200.62	J	500000	94.8		P
Magnesium	80 - 120	2030000.00		1618794.39		500000	81.5		P
Manganese	80 - 120	5090.00		-24.24	U	5000	101.9		P
Mercury	80 - 120	1.75		0.04	U	3	58.3		CV
Nickel	80 - 120	5000.00		-3.46	U	5000	99.9		P
Potassium	80 - 120	1060000.00		532929.77		500000	104.4		P
Selenium	80 - 120	5860.00		99.58		5000	115.1		P
Thallium	80 - 120	4850.00		-53.89	U	5000	97.0		P
Vanadium	80 - 120	5190.00		3.91	U	5000	103.8		P
Zinc	80 - 120	5120.00		26.73	U	5000	102.5		P

confirms MI-

no additional quals required - all field samples were flagged for MS/MSD ☆

Comments:

170311 1719

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75 - 125	49300		252	J	50000	98.1		P
Barium	75 - 125	1530		28.0	J	1500	100.1		P
Beryllium	75 - 125	541		2.40	U	500	108.2		P
Calcium	-	593000		553000		50000	80		P
Iron	75 - 125	48600		110	U	50000	97.2		P
Magnesium	-	1720000		1690000		50000	60	N	P
Manganese	75 - 125	484		7.00	U	500	96.8		P
Mercury	80 - 120	1.73		0.0469	J	3.00	57.4	N	CV
Nickel	75 - 125	497		18.6	U	500	99.4		P
Potassium	-	595000		552000		50000	86		P
Selenium	75 - 125	652		82.0	U	500	130.4	N	P
Sodium	-								NR
Thallium	75 - 125	540		88.0	U	500	108		P
Vanadium	75 - 125	516		5.20	J	500	102.2		P
Zinc	75 - 125	556		80.0	U	500	111.2		P

J/UJ

J/UJ

J+

Flag as noted in all field samples

Comments:

170311 1719

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3501997

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	49700		252	J	50000	98.9		P
Barium	80 - 120	1520		28.0	J	1500	99.5		P
Beryllium	80 - 120	544		2.40	U	500	108.8		P
Calcium	-	591000		553000		50000	76	N	P
Iron	80 - 120	48800		110	U	50000	97.6		P
Magnesium	-	1710000		1690000		50000	40	N	P
Manganese	80 - 120	481		7.00	U	500	96.2		P
Mercury	80 - 120	1.73		0.0469	J	3.00	57.4	N	CV
Nickel	80 - 120	496		18.6	U	500	99.2		P
Potassium	-	592000		552000		50000	80		P
Selenium	80 - 120	620		82.0	U	500	124	N	P
Sodium	-								NR
Thallium	80 - 120	526		88.0	U	500	105.2		P
Vanadium	80 - 120	517		5.20	J	500	102.4		P
Zinc	80 - 120	561		80.0	U	500	112.2		P

NQ MS OK
JUJ
JUJ
J+

Comments:

170311 1719

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211MSDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	-								NR
Barium	-								NR
Beryllium	-								NR
Calcium	-								NR
Iron	-								NR
Magnesium	-								NR
Manganese	-								NR
Mercury	-								NR
Nickel	-								NR
Potassium	-								NR
Selenium	-								NR
Sodium	-	14000000		15600000		50000	0 D	N	P
Thallium	-								NR
Vanadium	-								NR
Zinc	-								NR

NQ

out due to abundance

Comments:

170311 1719

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211SDDL1

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	-								NR
Barium	-								NR
Beryllium	-								NR
Calcium	-								NR
Iron	-								NR
Magnesium	-								NR
Manganese	-								NR
Mercury	-								NR
Nickel	-								NR
Potassium	-								NR
Selenium	-								NR
Sodium	-	13300000		15600000		50000	0 D	N	P
Thallium	-								NR
Vanadium	-								NR
Zinc	-								NR

NQ

out due to abundance

Comments:

170311 1742

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.: 350199703ADL1

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: Water Level:(low/med) LOW

Dissolved

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Sodium	80 - 120	18400000.00		15564938.68		5000000	57.2		P

NQ

Comments:

170311 1720

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.: VWW06-SW016-0211S

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205

Matrix (soil/water): WATER Level (low/med): MED

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75-125	89.3	B	20.0	U	100	89		MS
Arsenic	75-125	95.0 ~~47500~~	U	95.0	U	40.0	0	N	MS
Cadmium	75-125	45.1	B	42.0	U	50.0	90		MS
Chromium	75-125	321	B	129	B	200	96		MS
Cobalt	75-125	471	B	12.0	U	500	94		MS
Copper	75-125	174	B	149	B	250	10	N	MS
Lead	75-125	21.7	B	6.8	U	20.0	108		MS
Silver	75-125	43.8	B	11.0	U	50.0	88		MS

DES 3/7/11, 1:500 DL

1:500 DL

no Quals - high dilutions made recovery incalculable

Comments:

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.: VWW06-SW016-0211S

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0205-D

Matrix (soil/water): WATER Level (low/med): MED

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M	
Antimony	75-125	76.7	B	20.0	U	100	77		MS	
Arsenic	75-125	98.4	B	106	B	40.0	-20	N	MS	1:800
Cadmium	75-125	50.3	B	42.0	U	50.0	101		MS	
Chromium	75-125	290	B	80.0	U	200	145	N	MS	1:500
Cobalt	75-125	462	B	12.0	U	500	92		MS	
Copper	75-125	341	B	120	U	250	136	N	MS	1:500
Lead	75-125	26.8	B	6.8	U	20.0	134	N	MS	1:100
Silver	75-125	43.6	B	11.0	U	50.0	87		MS	

No Quals - high dilutions made recoveries uncalculable

Comments:

		YES	NO	N/A
	as "UJ". If between 126-150%, flag (J) all data ≥ MDL as "J". If greater than 150%, reject (R) and red-line all associated data ≥ MDL. (NOTE:Replace "N" with "J", "R" as appropriate.)			
A.1.17.5	**Soil/Sediment**			
	Are any spike recoveries:			
	(a) less than 10%?	___	[___]	___
	(b) between 10-74%?	___	[___]	___
	(c) between 126-200%?	___	[___]	___
	(d) greater than 200%?	___	[___]	___

Note - ICP-MS extracts were diluted from 1:100 to 1:500. Therefore non-compliant spike results were not used to flag results

ACTION:
If yes for any of the above, proceed as follows:

If the matrix spike recovery is less than 10%, reject (R) and red-line all associated data (detects & non-detects); if between 10-74%, qualify all associated data ≥ MDL as "J" and non-detects as "UJ"; if between 126-200%, flag (J) all associated data ≥ MDL as "J" If greater than 200%, reject (R) and red-line all associated data ≥ MDL. (NOTE:Replace "N" with "J" or "R" as appropriate.)

A.1.18 **Lab Duplicates) - Form VI**

A.1.18.1	Was the lab duplicate analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each matrix type?	[✓]	___	___
	For each concentration range (low or med.)?	[✓]	___	___
	For each analytical Method (ICP-AES/ICP-MS, Hg, CN) Used?	[✓]	___	___
	Was a lab duplicate prepared and analyzed with the SDG samples?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no for any of the above, flag (J) as estimated all the SDG sample results (detects & non-detects) for which the lab duplicate analysis was not performed.			
	NOTE: If more than one lab duplicate sample were analyzed for an SDG, then qualify the associated samples based on the worst lab duplicate analysis.			
A.1.18.2	Was a Field Blank or PE sample used for the Lab Duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) all SDG sample results (hits & non-detects) for which Field Blank or PE sample was used for duplicate analysis.			
A.1.18.3	Circle on each Form VI all values that are: RPD > 20%, or Absolute Difference > CRQL			
	Are all values within control limits (RPD ≤ 20% or absolute difference ≤ ±CRQL)?	[✓]	___	___
	If no, are all results outside the control limits flagged with an "*" (Lab Qualifier) on Form VI and on all Form I's?	[___]	___	✓
	ACTION: If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.			
	NOTE: The laboratory is not required to report on Form VI the RPD when both values are non-detects.			
A.1.18.4	Aqueous			
A.1.18.4.1	When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			

	YES	NO	N/A
is any RPD > 20% but < 100%?	___	[✓]	___
is any RPD ≥ 100%?	___	[___]	___

ACTION:
If the RPD is > 20% but < 100%, flag (J) as estimated the associated sample data ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line the associated sample data ≥ CRQL.

(NOTE:Replace "*" with "J" or "R" as appropriate.)

A.1.18.4.2 When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate values:

> ± CRQL?	___	[✓]	___
> ± 2xCRQL?	___	[___]	___

ACTION:
If the absolute difference is > CRQL, flag as estimated all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 2xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but < 5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.18.5 **Soil/Sediment**

A.1.18.5.1 When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%?	___	[___]	✓
is any RPD ≥ 120%?	___	[___]	___

ACTION:
If the RPD is ≥ 35% and < 120%, flag (J) as estimated the associated sample

		YES	NO	N/A
	data ≥ CRQL. If the RPD is ≥ 120%, reject (R)and red-line the associated sample data ≥ CRQL.			
A.1.18.5.2	When the sample and/or duplicate value <5xCRQL(substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and duplicate:			
	> ± 2 x CRQL?	___	[___]	✓
	> ± 4 x CRQL	___	[___]	✓

ACTION:
If the absolute difference is > 2 x CRQL, flag all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 4xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but <5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.19 Field Duplicates

Aqueous Field Duplicates

		YES	NO	N/A
A.1.19.1	Was an aqueous Field Duplicate pair collected and analyzed? (Check Sampling Trip Report)	[___]	✓	___

x1corr
JAC
41411

ACTION:
If yes, prepare a Form (Appendix A.4) for each aqueous Field Duplicate pair. Report the sample and Field Duplicate results on Appendix A.4 from their respective Form I's. Calculate and report RPD on Appendix A.4 when sample and its Field Duplicate values are both > 5xCRQL. Calculate and report the absolute difference on Appendix A.4 when at least one value (sample or duplicate) is <5xCRQL. Evaluate the aqueous Field Duplicate analysis in accordance with the

		YES	NO	N/A

QC criteria stated in Sections A.1.19.2 and A.1.19.3.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this the criteria to qualify the results.

A.1.19.2 Circle all values on the Form (Appendix A.4) for Field Duplicates that have:

RPD ≥ 20% or

Difference > ± CRQL

When sample and duplicate values are both ≥5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 20%?	___	[___]	___ ✓
is any RPD ≥ 100%?	___	[___]	___ ✓

ACTION:
If the RPD is >20% but < 100%, flag (J) only the associated sample and its Field Duplicate results ≥ CRQL. If the RPD is ≥ 100%, reject(R) and red-line only the associated sample and its Field Duplicate result ≥ CRQL.

A.1.19.3 When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate:

> ± CRQL?	___	[___]	___ ✓
> ± 2 x CRQL?	___	[___]	___ ✓

ACTION:
If the absolute difference is > CRQL, flag detects ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the difference is > 2xCRQL, reject (R) and red-line non-detects

		YES	NO	N/A

and results ≥ MDL but <5xCRQL of the sample and its Field Duplicate.

Soil/Sediment Field Duplicates

A.1.19.4 Was a soil field duplicate pair collected and analyzed? (Check Sampling Trip Report) [___] ___ ✓

ACTION:
If yes, for each soil Field Duplicate pair proceed as follows:

Prepare Appendix A.4 for each Field Duplicate pair. Report on Appendix A.4 all sample and its Field Duplicate results in MG/KG from their respective Form I's. Calculate and report RPD when sample and its duplicate values are both greater than 5xCRQL. Calculate and report the absolute difference when at least one value (sample or duplicate) is < 5xCRQL. Evaluate the Field Duplicate analysis in accordance with the QC Criteria stated in Sections A.1.19.5 and A.1.19.6.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and apply the criteria to qualify the results.

A.1.19.5 Circle on each Appendix A.4 all values that have:

RPD ≥ 35%, or Difference > ± 2xCRQL
When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%?	___	[___]	✓
is any RPD ≥ 120%?	___	[___]	___

ACTION:
If the RPD is ≥ 35% but < 120%,

		YES	NO	N/A
	flag only the associated sample and its Field Duplicate results ≥ CRQL as "J". If the RPD is ≥ 120%, reject (R) and red-line only the sample and its Field Duplicate results ≥ CRQL.			
A.1.19.6	When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and Field Duplicate:			
	> ± 2 x CRQL?	___	[___]	✓ ___
	> ± 4 x CRQL?	___	[___]	✓ ___
	ACTION: If the absolute difference is > 2xCRQL, flag Sample and its Field Duplicate resuts ≥ MDL but <5xCRQL as "J" and non-detects as "UJ". If the difference is >4xCRQL, reject(R) and red-line non-detects and detects ≥ MDL but <5xCRQL of the sample and its Field Duplicate.			
A.1.20	**Laboratory Control Sample (LCS)- Form VII**			
A.1.20.1	Was one LCS prepared and analyzed for:			
	Each SDG?	[✓]	___	___
	Each matrix type?	[✓]	___	___
	Each batch samples digested/distilled?	[✓]	___	___
	For each Method(ICP-AES,ICP-MS,Hg,CN) used?	[✓]	___	___
	Was an LCS prepared and analyzed with the samples?	✓ [___]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log and contact CLP PO or TOPO for submittal of the LCS results. Flag (J) as estimated all the data for which an LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for			

	YES	NO	N/A

more than 20 samples, then the first 20 samples analyzed are not flagged(J), but all additional samples must be qualified (J).

A.1.20.2 Aqueous LCS

Circle on each Form VII the LCS percent recoveries outside control limits 80-120%.

NOTE: 1.Use digested ICV as LCS for aqueous mercury
2.Use distilled ICV as LCS for aqueous cyanide

Is any LCS recovery:

Less than 50%?	___	[✓]	___
Between 50% and 79%?	___	[✓]	___
Between 121% and 150%?	___	[✓]	___
Greater than 150%?	___	[✓]	___

ACTION:
If the LCS recovery is less than 50%, reject (R) and red-line all associated sample data (detects & non-detects); for a recovery between 50-79%, flag detects as "J" all non-detects as "UJ". if the LCS recovery is between 121-150%, flag only detects as "J". if the recovery is greater than 150%, reject (R) and red-line all detects.

A.1.20.3 Solid LCS

If an analyte's MDL is equal to or greater than the true value of LCS, disregard the "Action" below for that analyte even though the LCS is out of control limits.

Is the LCS "Found" value greater than the Upper Control Limit reported on Form VII?	___	[___]	✓

ACTION:

		YES	NO	N/A
	If yes, flag (J) all the associated detects ≥ MDL as estimated (J).			
	Is the LCS "Found" value lower than the Lower Control Limit reported on Form VII?	___	[___]	[✓]
	ACTION: If yes, flag detects as "J" and non-dectes as "UJ".			
A.1.21	**ICP-AES/ICP-MS Serial Dilution - Form VIII** **NOTE:** Serial dilution analysis is required only when the initial concentration is equal to or greater than 50 x MDL.			
A.1.21.1	Was a Serial Dilution analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each matrix type?	[✓]	___	___
	For each concentration range (low or med.)?	[✓]	___	___
	Was a Serial Dilution sample analyzed with the SDG samples?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) detects ≥ MDL of all the SDG samples for which the ICP Serial Dilution Analysis was not performed.			
A.1.21.2	Was a Field Blank or PE sample used for the Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) detects ≥ MDL of all the SDG samples			
A.1.21.3	Circle on Form VIII the Percent Differences (%D) between sample results and its dilution results that are outside the control limits ± 10%			

U.S. EPA - CLP

9

SERIAL DILUTIONS

EPA Sample No.: 350199703L

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code: PEL Case No.: SAS No: SDG No.: 3501997

Matrix: Water Level:(low/med) LOW

Total

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M
Aluminum	428.40	J	2080.00	J	380		P
Barium	33.94	J	38.60	J	14	E	P
Beryllium	1.76	J	12.00	U			P
Calcium	538776.01		550000.00		2.1		P
Iron	200.62	J	341.00	J	70		P
Magnesium	1618794.39		1710000.00		5.6		P
Manganese	-24.24	U	35.00	U			P
Mercury	0.04	U	0.37	U			CV
Nickel	-3.46	U	93.00	U			P
Potassium	532929.77		511000.00		4.1		P
Selenium	99.58		410.00	U			P
Thallium	-53.89	U	440.00	U			P
Vanadium	3.91	U	44.00	U			P
Zinc	26.73	U	400.00	U			P

JUJ

Comments:

170311 1719

U.S. EPA - CLP

9

SERIAL DILUTIONS

EPA Sample No.

350199703L

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3501997

Matrix: Water Level:(low/med) LOW

Dissolved

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M
Aluminum	252.44	J	1700.00	J	570		P
Barium	28.00	J	24.00	J	14	E	P
Beryllium	0.18	U	12.00	U			P
Calcium	553426.47		543000.00		1.9		P
Iron	-34.66	U	550.00	U			P
Magnesium	1686015.47		1710000.00		1.4		P
Manganese	-28.01	U	35.00	U			P
Mercury	0.05	J	0.37	U			CV
Nickel	-20.77	U	93.00	U			P
Potassium	551711.77		502000.00		9.0		P
Selenium	28.66	U	410.00	U			P
Thallium	0.29	U	440.00	U			P
Vanadium	5.21	J	44.00	U			P
Zinc	28.44	U	400.00	U			P

JUJ

Comments:

170311 1720

		YES	NO	N/A
	when initial concentrations ≥ 50 x MDLs.			
	Are results outside the control limits flagged with an "E"(Lab Qualifier) on Form VIII and all Form I's?	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/ Non-Compliance Section of the Data Review Narrative.			
A.1.21.4	Are any %D values:			
	> 10%?	✓	[___]	___
	≥ 100%?	___	[✓]	___
	ACTION: If the Percent Difference (%D) is greater than 10%, flag (J) as estimated all associated samples whose raw data ≥ MDL; if the %D is ≥ 100%, reject (R) and red-line all associated samples with raw data ≥ MDL.			
	(NOTE:Replace "E" with "J" or "R" as appropriate.)			
A.1.22	**Total/Dissolved or Inorganic/Total Analytes**			
A.1.22.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s)?	✓	[___]	___
	Were any analyses performed for inorganic as well as total analytes on the same sample(s)?	___	[___]	✓
	ACTION: If yes, prepare a Form (Appendix A.5) to compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference on Appendix A.5 as a percent of the total analyte only when both of the following conditions are fulfilled: (1) The dissolved(or inorganic)concentration is greater than total concentration, and (2) greater than or equal to 5xMDL.			
A.1.22.2	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%?	___	[✓]	___

Total & Dissolved Analyte Concentrations

Per Region II validation SOP:

Note: Comparison between total and dissolved results is made only when both of the following conditions is met:

1. the dissolved concentration is greater than the total concentration, AND
2. the dissolved concentration is greater than or equal to 5X the LOD.

If %Difference is greater than 20% but less than 50% results are J, if >50% results are R.

Sample ID: VWW06-SW014-0211 Duplicate Sample ID: VWW06-SW014-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium	519000	535000	3
magnesium	1570000	1640000	4
sodium	13600000	13900000	2
			#DIV/0!
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: VWW06-SW015-0211 Duplicate Sample ID: VWW06-SW015-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium	503000	556000	11
magnesium	1550000	1680000	8
sodium	13600000	14500000	7
potassium	541000	550000	2
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: VWW06-SW016-0211 Duplicate Sample ID: VWW06-SW016-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium	539000	553000	3
magnesium	1620000	1690000	4
sodium	13800000	15600000	13
potassium	533000	552000	4
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: VWW06-SW017-0211 Duplicate Sample ID: VWW06-SW017-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium	512000	548000	7
magnesium	1520000	1690000	11
sodium	13200000	13700000	4
potassium	521000	539000	3
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: VWW06-SW001-0211 Duplicate Sample ID: VWW06-SW001-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium	393000	400000	2
magnesium	1200000	1270000	6
			#DIV/0!
			#DIV/0!
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID: VWW06-SW002-0211 Duplicate Sample ID: VWW06-SW002-0211

Analyte	Total Conc.	Dissolved Conc.	%D
calcium	392000	400000	2
magnesium	1220000	1260000	3
			#DIV/0!
			#DIV/0!
			#DIV/0!

Action: No action required - %D criteria were met.

		YES	NO	N/A
A.1.22.3	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 50%?	___	[✓]	___

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) and red-line both the values.

A.1.23 **Field Blank - Form I**
NOTE: Designate "Field Blank" as such on Form I

A.1.23.1	Was a Field/Rinsate Bank collected and analyzed with the SDG samples?	[✓]	___	___
	If yes, is any Field/Rinsate Blank absolute value of an analyte on Form I greater than its CRQL (or 2xMDL when MDL>CRQL)?	✓	[___]	___
	If yes, circle the Field Blank value on Form I that is greater than the CRQL, (or 2 x MDL when MDL > CRQL).	no goals required		
	Is any Field Blank value greater than CRQL also greater than the Preparation Blank value?	___	[✓]	___
	If yes, is the Field Blank value (> CRQL and > the prep. blank value) already rejected due to other QC criteria?	[___]	___	✓

ACTION:
If the Field Blank value was not rejected, reject all associated sample data (except the Field Blank results) greater than the CRQL but less than the Field Blank value. Reject on Form I's the soil sample results whose raw values in ug/L in the instrument printout are greater than the CRQL but less than the Field Blank value in ug/L. Flag as "J" detects between the Field Blank value and 10xField Blank value. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

If the Field Blank value is less than the

		YES	NO	N/A
	Prep.Blank value, do not qualify the sample results due to the Field Blank criteria.			

NOTE:
1. Field Blank result previously rejected due to other criteria cannot be used to qualify field samples.
2. Do not use Rinsate Blank associated with soils to qualify water samples and vice versa.

A.1.24 **Verification of Instrumental Parameters - Form IX, XA, XB, XI**

A.1.24.1 Is verification report present for:

Method Detection Limits (Form IX-Annually)?	[✓]	___	___
ICP-AES Interelement Correction Factors (Form XA & XB -Quarterly)?	[✓]	___	___
ICP-AES & ICP-MS Linear Ranges (Form XI-Quarterly)?	[✓]	___	___

ACTION:
If no, contact CLP PO/TOPO for submittal from the laboratory.

A.1.24.2 **Method Detection Limits - Form IX**

A.1.24.2.1 Are MDLs present on Form IX for:

All the analytes?	[✓]	___	___
All the instruments used?	[✓]	___	___
Digested and undigested samples and Calib.Blanks?	[✓]	___	___
ICP-AES and ICP-MS when both instruments are used for the same analyte? (XICorr JAC 4/4/11)	[✓]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO/TOPO for submittal of the MDLs from the laboratory. Report to CLP PO and write in the Contract Problems/ Non-Compliance Section of the Data Review Narrative if the MDL concentration is not less than ½ CRQL.

		YES	NO	N/A
A.1.24.2.2	Is MDL greater than the CRQL for any analyte?	___	[✓]	___
	If yes, is the analyte concentration on Form I greater than 5 x MDL for the sample analyzed on the instrument whose MDL exceeds CRQL?	[___]	___	✓

ACTION:
If no, flag as estimated (J) all values less than five times MDL for the analyte whose MDL exceeds the CRQL.

A.1.24.3 **Linear Ranges - Form XI**

A.1.24.3.1	Was any sample result higher than the high linear range for ICP-AES or ICP-MS?	___	[✓]	___
	Was any sample result higher than the highest calibration standard for mercury or cyanide?	___	[✓]	___
	If yes for any of the above, was the sample diluted to obtain the result reported on Form I?	[___]	___	✓

Dilutions were required for Na quant. Other DL performed due to NC 15.

ACTION:
If no, flag (J) as estimated the affected detects (≥ MDL) reported on Form I.

A.1.25 **ICP-MS Tune Analysis - Form XIV**

A.1.25.1	Was the ICP-MS instrument tuned prior to calibration?	[✓]	___	___

ACTION:
If no, reject (R) and red-line all sample data for which tuning was not performed.

A.1.25.2	Was the tuning solution analyzed or scanned at least five times consecutively?	[✓]	___	___
	Were all the required isotopes spanning the analytical range present in the tuning solution?	[✓]	___	___
	Was the mass resolution within			

	YES	NO	N/A
0.1 amu for each isotope in the tuning solution?	[✓]		
Was %RSD less than 5% for each isotope of each analyte in the tuning solution?	[✓]		

ACTION:
If no for any of the above, qualify all results ≥ MDL associated with that Tune as estimated "J", and all non-detects associated with that Tune as "UJ".

A.1.26 ICP-MS Internal Standards - Form XV

A.1.26.1 Were the Internal Standards added to all the samples and all QC samples and calibration standards (except the Tuning Solution)?	[✓]		
Were all the target analyte masses bracketed by the masses of the five internal standards?	[✓]		

ACTION:
If none of the Internal Standards was added to the samples, reject (R) and red-line all the associated sample data (detects & non-detects). If internal standards were used but did not cover all the analyte masses, reject (R) and red-line only the analyte results not bracketed by the internal standard masses.

A.1.26.2 Was the intensity of an Internal Standard in each sample within 60-125% of the intensity of the same Internal Standard in the calibration blank? lab QC limits used	[ ]	✓	
If no, was the original sample diluted two fold, Internal Standard added and the sample re-analyzed? 1:100 & 1:500 due to Sodium level & interference	[✓]		
Was the %RI for the two fold diluted sample within the acceptance limits (~~60-125%~~)? lab QC limits	[✓]		

ACTION:
If no for any of the above, flag detects as "J" and non-detects "UJ" of all the analytes with atomic masses between the

atomic mass of the internal standard lighter

Results from ½-est dilution giving acceptable 15 %R No Quals Rqd.

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0205

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
S0	0923	100		100		100		100		100		100	
S	0928	102		100		101		101		101		101	
S	0932	101		100		101		102		101		101	
S	0937	102		100		101		101		101		100	
S	0941	101		98		98		99		99		99	
S	0945	98		99		95		97		99		93	
S	0950	99		102		94		98		100		90	
ICV	0954	104		105		100		102		103		99	
ICB	0959	106		104		104		104		103		104	
ZZZZZZ	1004	105		103		103		104		104		104	
ICSA	1008	76		86		76		83		82		72	
ICSAB	1013	76		85		76		84		83		71	
ZZZZZZ	1017	101		103		100		103		106		98	
ZZZZZZ	1022	76		86		76		84		83		71	
CCV	1026	99		102		99		103		106		98	
CCB	1031	102		101		104		106		106		105	
PBW	1035	100		99		101		103		104		105	
LCW	1039	97		95		97		100		102		100	
VWW06-EB01-020711	1044	98		97		100		102		103		103	
ZZZZZZ	1048	100		99		101		103		103		104	
VWW06-EB02-020711	1053	99		99		101		102		102		102	
CCV	1057	95		94		92		96		99		93	
CCB	1102	98		94		96		99		100		100	
1:100 VWW06-SW014-0211	1106	105		106		99		102		103		93	
ZZZZZZ	1111	116		118		107		108		107		97	
1:100 VWW06-SW015-0211	1115	122	R	124	R	111		111		109		98	
ZZZZZZ	1120	126	R	129	R	115		114		111		99	
ZZZZZZ	1124	128	R	124	R	121	R	117		111		112	
ZZZZZZ	1129	121	R	116		114		111		107		107	
CCV	1133	104		104		99		101		102		95	

X1_110217B

ISM_002

FORM XV-IN

SW846

3501997

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0205

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
CCB	1137	106		103		104		104		102		103	
VWW06-SW016-0211	1142	111		113		104		105		106		94	
VWW06-SW016-0211D	1146	121	R	124	R	112		112		109		98	
VWW06-SW016-0211S	1150	127	R	132	R	118		116		111		99	
VWW06-SW016-0211L	1155	132	R	131	R	123	R	119		113		108	
ZZZZZZ	1159	126	R	122	R	119		115		109		109	
ZZZZZZ	1204	121	R	116		114		112		107		107	
ZZZZZZ	1208	119		113		112		110		105		105	
CCV	1213	104		103		98		100		101		94	
CCB	1217	107		103		104		103		102		102	
VWW06-SW015-0211	1222	109		106		103		103		104		99	
ZZZZZZ	1226	112		108		104		105		104		100	
VWW06-SW016-0211	1231	115		110		105		105		104		101	
VWW06-SW016-0211D	1235	116		111		107		106		105		101	
ZZZZZZ	1240	115		109		108		107		104		103	
VWW06-SW016-0211S	1244	116		109		105		105		103		100	
VWW06-SW016-0211L	1249	121	R	111		111		110		107		107	
ZZZZZZ	1253	117		107		108		108		105		106	
CCV	1258	105		100		97		100		102		96	
CCB	1302	109		101		104		105		103		103	
ZZZZZZ	1307	111		105		104		105		104		101	
ZZZZZZ	1311	114		106		105		106		105		102	
ZZZZZZ	1316	116		108		107		106		105		103	
ZZZZZZ	1320	117		107		108		108		106		106	
VWW06-SW017-0211	1325	117		107		106		107		105		103	
ZZZZZZ	1329	120		110		108		108		106		103	
ZZZZZZ	1333	119		108		109		108		105		106	
CCV	1338	104		99		96		99		101		94	
CCB	1342	109		101		103		103		102		103	
VWW06-SW001-0211	1347	111		103		103		104		104		102	

X1_110217B

ISM_002

FORM XV-IN

SW846

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0205

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
ZZZZZZ	1606	120		109		107		107		104		103	
ZZZZZZ	1611	121	R	110		108		107		104		103	
ZZZZZZ	1615	121	R	108		109		107		104		105	
CCV	1620	106		100		96		98		100		94	
CCB	1624	113		105		105		105		102		103	
ZZZZZZ	1629	120		118		108		108		106		96	
ZZZZZZ	1633	129	R	126	R	114		112		109		98	
ZZZZZZ	1638	131	R	129	R	116		114		110		99	
ZZZZZZ	1642	136	R	127	R	121	R	117		111		107	
* 1:100 VWW06-SW017-0211	1647	131	R	127	R	114		113		109		98	
ZZZZZZ	1652	137	R	133	R	118		116		111		100	
* 1:100 VWW06-SW001-0211	1656	140	R	137	R	123	R	120		112		102	
ZZZZZZ	1701	142	R	139	R	125	R	120		113		103	
* 1:100 VWW06-SW002-0211	1705	144	R	140	R	125	R	121	R	113		102	
ZZZZZZ	1710	144	R	141	R	125	R	122	R	114		103	
CCV	1714	117		112		105		106		103		97	
CCB	1719	119		112		112		110		105		105	

* See 1:500 DL

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0205-D

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
S0	0923	100		100		100		100		100		100	
S	0928	102		100		101		101		101		101	
S	0932	101		100		101		102		101		101	
S	0937	102		100		101		101		101		100	
S	0941	101		98		98		99		99		99	
S	0945	98		99		95		97		99		93	
S	0950	99		102		94		98		100		90	
ICV	0954	104		105		100		102		103		99	
ICB	0959	106		104		104		104		103		104	
ZZZZZZ	1004	105		103		103		104		104		104	
ICSA	1008	76		86		76		83		82		72	
ICSAB	1013	76		85		76		84		83		71	
ZZZZZZ	1017	101		103		100		103		106		98	
ZZZZZZ	1022	76		86		76		84		83		71	
CCV	1026	99		102		99		103		106		98	
CCB	1031	102		101		104		106		106		105	
PBW	1035	100		99		101		103		104		105	
LCW	1039	97		95		97		100		102		100	
ZZZZZZ	1044	98		97		100		102		103		103	
VWW06-EB01-020711	1048	100		99		101		103		103		104	
ZZZZZZ	1053	99		99		101		102		102		102	
CCV	1057	95		94		92		96		99		93	
CCB	1102	98		94		96		99		100		100	
ZZZZZZ	1106	105		106		99		102		103		93	
VWW06-SW014-0211	1111	116		118		107		108		107		97	
ZZZZZZ	1115	122	R	124	R	111		111		109		98	
VWW06-SW015-0211	1120	126	R	129	R	115		114		111		99	
ZZZZZZ	1124	128	R	124	R	121	R	117		111		112	
ZZZZZZ	1129	121	R	116		114		111		107		107	
CCV	1133	104		104		99		101		102		95	

1:100

See 1:500

X1_110217B

ISM_002

FORM XV-IN

SW846

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3501997

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0205-D

ICP-MS Instrument ID: X1 Start Date: 02/17/2011 End Date: 02/17/2011

X1 110217B

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
zzzzzz	1606	120		109		107		107		104		103	
zzzzzz	1611	121	R	110		108		107		104		103	
zzzzzz	1615	121	R	108		109		107		104		105	
CCV	1620	106		100		96		98		100		94	
CCB	1624	113		105		105		105		102		103	
VWW06-SW016-0211	1629	120		118		108		108		106		96	
VWW06-SW016-0211D	1633	129	R	126	R	114		112		109		98	
VWW06-SW016-0211S	1638	131	R	129	R	116		114		110		99	
VWW06-SW016-0211L	1642	136	R	127	R	121	R	117		111		107	
zzzzzz	1647	131	R	127	R	114		113		109		98	
VWW06-SW017-0211	1652	137	R	133	R	118		116		111		100	
zzzzzz	1656	140	R	137	R	123	R	120		112		102	
VWW06-SW001-0211	1701	142	R	139	R	125	R	120		113		103	
zzzzzz	1705	144	R	140	R	125	R	121	R	113		102	
VWW06-SW002-0211	1710	144	R	141	R	125	R	122	R	114		103	
CCV	1714	117		112		105		106		103		97	
CCB	1719	119		112		112		110		105		105	

* 1:100

* 1:100

* 1:100

*Results reported from 1:500 DL

than the affected internal standard, and the atomic mass of the internal standard heavier than the affected internal standard.

A.1.27 Percent Solids of Sediments

A.1.27.1 Are percent solids in sediment(s):

< 50%? ___ [___] ✓

ACTION:
If yes, qualify as estimated (J) all detects and non-detects of a sample that has percent solids less than 50%(i.e.,moisture content greater than 50%).

H20 only in this SDG

NOTE:
Flag(J) only the sample results that were not previously flagged due to other QC criteria.

Inorganic Data Review Narrative

Case# _____ Site: _____ Matrix: Soil ____

SDG# _____ Lab: _____ Water ____

Sampling Team: _____ Reviewer: _____ Other _____

A.2.1 Data Validation Flags:
The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as estimated

R and Red-Line - A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results ≥ MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully usable.

A.2.2 Laboratory Qualifiers:
The CLP laboratory applies a contractual qualifier on all

349

This SDG contains hexavalent chromium analysis using SW-846 7196A. Resubmissions were not required.

Laboratory: PEL

HOLDING TIMES

Sampling Date: 2/7/11
Received Date: 2/8/11
Analysis Dates: 2/8/11
Cooler temps: 1.6-4.6

All total and dissolved water samples exceeded the 24 hour holding time by 1-5 hours; therefore results were qualified as estimated (J/UJ) with the exception of total samples VWW06-SW014-0211, VWW06-EB02-020711 and VWW06-SW001-0211-0211.

CALIBRATIONS

All initial calibration criteria were met. Calibration verification criteria were met for all ICV and CCV standards. No qualifications were required.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- Apply the same data validation guidelines to any associated calibration, preparation, and field QC blanks and all associated samples.
- Qualification/Action codes:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U at LOD	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD
R or J_+	The blank contaminant concentration was greater than the LOD and the sample result is greater than the LOD but less than 10X the blank contaminant concentration. The reported results are flagged either as rejected R or biased high J+ based on the professional judgment of the validator.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	RL (LOD)
VWW06-EB01-020711	hexavalent chromium	no positive results	
VWW06-EB02-020711			

Sample ID	Analyte	Q Flag	Q Code
no qualifications required			

The concentration noted for the CCBs is the highest concentration in all the CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for noted CCB contamination. See worksheets for associations. Samples are qualified for field QC blank contamination based on QC tracking provided by CH2M HILL. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment.

LCS

All LCS recoveries and RPDs were acceptable.

MATRIX SPIKE/DUPLICATE SUMMARY

The MS / MSD pair analyzed for sample VWW06-SW016-0211exhibited acceptable recoveries and RPD.

FIELD DUPLICATE SAMPLE SUMMARY

Note: Field duplicate results are assessed only if both results are above the CRDL.

Sample ID: **Duplicate Sample ID:**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium			#DIV/0!
			#DIV/0!
			#DIV/0!

Comments:

Sample ID: **Duplicate Sample ID:**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium			#DIV/0!
			#DIV/0!
			#DIV/0!

Comments: No qualifications required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Detection limits were acceptable. Raw data was verified.

Reviewer _____ **Date:** 4/12/11

CH2M HILL
SWMU 6 CTO-111
SDG# 3501997

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: The following samples were analyzed out of hold: VWW06-EB01-020711, VWW06-SW001-0211, VWW06-SW002-0211, VWW06-SW014-0211, VWW06-SW015-0211, VWW06-SW016-0211, VWW06-SW016-0211MS, VWW06-SW016-0211SD, VWW06-SW017-0211. The samples were received out of hold and were analyzed as soon as possible to get as close to the holding time as possible.

III. METHODS

Analyses were performed according to PEL Laboratory's Standard Operating Procedures and EPA Method 7196A.

IV. PREPARATION

There is no preparation step for this test.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

A client requested MS/SD set was analyzed.

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

All percent recovery and relative percent difference (RPD) criteria were met.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: The following samples were analyzed out of hold: VWAE-EB01-020711, VWW06-EB01-020711, VWW06-SW015-0211, VWW06-SW016-0211, VWW06-SW016-0211MS, VWW06-SW016-0211SD, VWW06-SW017-0211. The samples were received out of hold and were analyzed as soon as possible to get as close to the holding as possible.

III. METHODS

Analyses were performed according to PEL Laboratory's Standard Operating Procedures and EPA Method 7196A.

IV. PREPARATION

There is no preparation step for this test.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

A client requested MS/SD set was analyzed.

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3501997

Client: CH2M Hill

All percent recovery and relative percent difference (RPD) criteria were met.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

April 19, 2011
SDG# 3502004, PEL; K0215/K0215D Mtkem
Vieques Island, Puerto Rico

Dear Ms. Weber,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 3502004/K0215/K0215D. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, 8081B-Rev. 1.0, October 2006-SOP HW-44, 8082A- Rev 1, October 2006- SOP# HW-45, and ILM05.3-Rev. 13, September 2006-SOP #HW-2) and professional judgment. The SOP for the inorganic parameters (metals) is used but is modified as necessary to reflect the QC requirements of the method and the site SAP. Region II has not developed a validation checklist SOP for the method used to assess hexavalent chromium in this SDG (SW-846 method 7196A). Alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	V	SV	Pest	PCB	TM 6010	DM 6010	TM 6020	DM 6020	Hg (t)	Hg (d)	T HCr	D HCr
VWW06-SD001-0211	350200416	soil	X	X	X	X	X		X		X		X	
VWW06-SD002-0211	350200417	soil	X	X	X	X	X		X		X		X	
VWW06-TB01-020811	350200405	water	X											
VWW06-SW023P-0211	350200401	water			X	X	X	X	X	X	X	X	X	X
VWW06-SW023-0211	350200402	water			X	X	X	X	X	X	X	X	X	X
VWW06-SW022-0211	350200403	water			X	X	X	X	X	X	X	X	X	X
VWW06-SW021-0211	350200404	water			X	X	X	X	X	X	X	X	X	X
VWW06-SW018-0211	350200406	water			X	X	X	X	X	X	X	X	X	X
VWW06-SW019-0211	350200406	water			X	X	X	X	X	X	X	X	X	X
VWW06-SW020-0211	350200407	water			X	X	X	X	X	X	X	X	X	X
VWW06-EB01-020811	350200408	water			X	X	X	X	X	X	X	X	X	X
VWW06-EB02-020811	350200409	water			X	X								
VWW06-SD014-0211	350200412	soil			X	X	X		X		X		X	
VWW06-SD015-0211	350200413	soil			X	X	X		X		X		X	
VWW06-SD016-0211	350200414	soil			X	X	X		X		X		X	
VWW06-SD017-0211	350200415	soil			X	X	X		X		X		X	
VWW06-SS012-0211	350200410	soil				X								
VWW06-SS013-0211	350200411	soil				X								
VWW06-SS013P-0211	350200419	soil				X								
VWW06-SD014-0211MS	350200412MS	soil					X		X					
VWW06-SD014-0211MSD	350200412MSD	soil					X		X					

*Please note – the ID in the Lab ID column is the PEL Lab ID.

The following quality control samples were provided with this SDG: sample VWW06-TB01-020811- trip blank; sample VWW06-EB01-020811- equipment blank; and sample VWW06-SW023P-0211- duplicate of sample VWW06-SW023-0211.

The samples were evaluated based on the following criteria:

• Data Completeness	*
• Sample Condition	
• Technical Holding Times	
• GC/MS Tuning	*
• GC Performance	*
• ICP MS Tuning	*
• Initial/Continuing Calibrations	*
• ICSA/ICSAB Standards	*
• LLQ Standards	*
• Blanks	
• Internal Standards	
• Surrogate Recoveries	
• Laboratory Control Samples	*
• Matrix Spike Recoveries	*
• Matrix Duplicate RPDs	
• Serial Dilutions	
• Field Duplicates	*
• Identification/Quantitation	
• Reporting Limits	*
• Tentatively Identified Compounds	NA

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. Please note that when a compound or analyte is flagged due to blank contamination the BL qualifier code takes precedence over all other qualifier codes except a code that explains rejected data.

Please note: the validator has added a T or a D to the metals IDs to indicate total or dissolved as necessary.

All Fractions

All results for all soil samples were qualified as estimated due to high percent moisture content.

VOA

Due to high surrogate recoveries, positive results were qualified as estimated in the sample. The initial analysis of the soil samples were excluded, in favor of the re-analysis, due to low surrogate recoveries.

Low internal standard area recovery was exhibited in one sample that resulted in qualifications to the associated compounds.

SVOA

No additional qualifications were required.

Pesticides

Some reported positive results required qualification based on column quantitation %Ds greater than 40%.

PCBs

No additional qualifications were required.

Total & Dissolved Metals

Blank contamination was noted and qualification was required in the samples in this SDG.

The submitted matrix duplicate exhibited several non-compliant RPDs. Qualifications to the data were required.

Mercury was recovered below the QC limit in the post digestion spike (PDS) in both the total and dissolved analyses. The reported results for mercury in the native sample were qualified as estimated J/UJ.

The serial dilution analyses exhibited non-compliant %Ds. Results were qualified or rejected based on Region II guidelines.

Hexavalent Chromium

All results for all soil samples were qualified as estimated due to high percent moisture content.

Several water samples exceeded the required 24-hour holding time; therefore results were qualified as estimated.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the metals fractions. The low level quantitation standard summary data was not present in the data packages. Both PEL and Mitkem were notified and they submitted responses to the request. Resubmissions were required for the pesticides fraction for one sample and all surrogate recoveries (waters) for which the quantitation calculations were performed incorrectly. The laboratory resubmitted all necessary data. Copies of the responses are included in the validation worksheets section of this report. The updated form 1 for the pesticide sample is included in this validation report.

Sample Condition

All Fractions

The following soil samples contained 50-90% water that resulted in qualifying all results as estimated.

Sample ID	% Moisture	Qualifier	Q Code
VWW06-SD001-0211	77	J/UJ	%SOL
VWW06-SD002-0211	69		
VWW06-SD014-0211	82		
VWW06-SD015-0211	71.6		
VWW06-SD016-0211	80.3		
VWW06-SD017-0211	83.8		

Technical Holding Times

According to chain of custody records, sampling was performed on 2/7-8/11 and samples were received at PEL on 2/9/11 and at Mitkem on 2/11/11. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

Hexavalent Chromium

All total and dissolved water samples, with the exception of sample VWW06-SW018-0211 (total), exceeded the 24 hour holding time by 4-25 hours; therefore results were qualified as estimated (J/UJ) (qualifier code: HT).

Blanks

Metals

Associated blanks exhibited contamination as noted in the following table.

Blank ID	Analyte	Concentration	Action Level
ICB – 6020 SD's	selenium	0.172J ug/L	LOD
ICB – 6020 SW's (total & diss)	arsenic	0.292J ug/L	
ICB – 6010b SD's & SW's (total)	iron	31.2J ug/L	
	thallium	4.68J ug/L	
CCB11	vanadium	0.451J ug/L	
ICB – 6010B SW's (diss)	aluminum	21.3J ug/L	

Please note, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag	Q Code
VWW06-SD001-0211, VWW06-SD002-0211, VWW06-SD014-0211, VWW06-SD015-0211, VWW06-SD016-0211, VWW06-SD017-0211,	selenium	U at LOD	MBL
VWW06-SW018-0211 T, VWW06-SW023-0211 T, VWW06-SW023P-0211 T, VWW06-SW018-0211 D, VWW06-SW020-0211 D, VWW06-SW023P-0211 D	arsenic	U at LOD	MBL
VWW06-SW021-0211 T	iron	U at LOD	MBL
VWW06-SW023P-0211 T, VWW06-SW022-0211 T, VWW06-SW020-0211 T	thallium	U at LOD	MBL
VWW06-SW023-0211 T, VWW06-SW022-0211 T, VWW06-SW021-0211 T	vanadium	U at LOD	MBL
VWW06-SW023-0211 D, VWW06-SW022-0211 D, VWW06-SW018-0211 D	aluminum	U at LOD	MBL

Internal Standards

VOA

Sample VWW06-SD02-0211RE exhibited low recoveries for internal standard 1,4-dichlorobenzne-d4; therefore all results associated with this standard were qualified as estimated (J/UJ), qualifier code: ISL.

Surrogates

VOA

Sample VWW06-SD02-0211RE exhibited high surrogate recovery for 4-bromofluorobenzene at 133% (QC limit 85-120%); therefore all positive results were qualified as estimated (J), qualifier code: SSH.

Matrix Duplicates

Total and Dissolved Metals

The matrix duplicate submitted for the soil samples exhibited non-compliant RPDs for nine analytes. A summary of these non-compliances and affected samples are noted in the following table.

MD	Analytes	Samples	RPD	Q Flag	Q Code
VWW06-SD014-0211	aluminum	all soil samples	38.5	J/UJ	MDP
	calcium		25.1		
	copper		44.7		
	iron		73.3		
	magnesium		31.9		
	manganese		99		
	potassium		22.6		
	vanadium		39.7		
	zinc		22.9		

Post Digestion Spikes

Total and Dissolved Metals

The post-digestion spike analyzed for the total and dissolved mercury sample noted below exhibited low recoveries. A summary of these non-compliances and affected samples are noted in the following table. Qualifications were made in the native samples/field duplicates only.

PDS	Analytes	Samples	%R	Q Flag	Q Code
VWW06-SW023P-0211 T	mercury	VWW06-SW023-0211 T VWW06-SW023P-0211 T	65.3	J/UJ	OT
VWW06-SW023P-0211 D	mercury	VWW06-SW023-0211 D VWW06-SW023P-0211 D	68.4	J/UJ	OT

Serial Dilutions

Total & Dissolved Metals

The serial dilutions submitted in this SDG exhibited non-compliant %Ds, requiring qualification/rejection in the field samples. A summary of these non-compliances and affected samples are noted in the following table. Qualifications were made per Region II guidelines.

SD	Analytes	Samples	%D	Q Flag	Q Code
VWW06-SW023-0211 T	aluminum	all total water field samples	180	R	SD
	iron		16	J/UJ	
VWW06-SW023-0211 T	calcium	all dissolved water field samples	360	R	SD
	magnesium		360		
	potassium		360		

Identification/Quantitation

VOA

Samples VWW06-SD001-0211 and VWW06-SD02-0211 exhibited low surrogate recoveries; therefore these samples were reanalyzed. The re-analysis of sample VWW06-SD01-0211 resulted in compliant surrogate recoveries. The re-analysis of sample VWW06-SD02-0211 resulted in one high recovery. Therefore the initial analyses of both samples were excluded, in favor of the re-analysis.

Pesticides

Qualifications were required in the samples due to high (>40%) column quantitation %Ds. Region II guidelines were followed in applying these qualifications. Sample results were flagged as noted in the following table.

Sample ID	Compound	Column Quant %D	Qualifier	Q Code
VWW06-SW018-0211	beta-BHC	74.29	J	2C
	gamma-BHC	122.98	U at LOD	
	heptachlor	42.74	J	
	aldrin	74.29	NJ	
	endrin aldehyde	48.89	J	
	gamma-chlordane	64.86	J	
VWW06-SD002-0211	4,4-DDE	42.86	J	2C

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff
President

Jacqueline Cleveland
Vice President

CH2M HILL
Vieques, Puerto Rico – SWMU 6
SDG# 3502004/K0215/K0215D

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SD001-0211RE, VWW06-SD002-0211RE	all results	+/-	J/UJ	%SOL
VWW06-SD02-0211RE*	all compounds associated with: 1,4-dichlorobenzne-d4	+/-	J/UJ	ISL
VWW06-SD02-0211RE*	all results	+	J	SSH
VWW06-SD001-0211, VWW06-SD002-0211	all results	+/-	exclude	RE

**final qualifier due to high moisture content*

SVOA

Sample ID	Compound	Results	Q flag	Q Code
VWW06-SD001-0211, VWW06-SD002-0211	all results	+/-	J/UJ	%SOL

Pesticides

Sample ID	Compound	Results	Q flag	Q Code
all soil samples	all compounds	+/-	J/UJ	%SOL
VWW06-SW018-0211	beta-BHC	+JP	J	2C
	gamma-BHC	+JP	U at LOD	
	heptachlor	+JP	J	
	aldrin	+JP	NJ	
	endrin aldehyde	+JP	J	
	gamma-chlordane	+JP	J	
VWW06-SD002-0211	4,4'-DDE*	+JP	J	2C

**Final qualifier code is %SOL*

PCBs

Sample ID	Compound	Results	Q flag	Q Code
all soil samples	all compounds	+/-	J/UJ	%SOL

Total & Dissolved Metals

Sample ID	Analyte	Results	Q flag	Q Code
all soil samples	all analytes	+/-	J/UJ	%SOL
VWW06-SD001-0211, VWW06-SD002-0211, VWW06-SD014-0211, VWW06-SD015-0211, VWW06-SD016-0211, VWW06-SD017-0211,	selenium	+J	U at LOD	MBL
VWW06-SW018-0211 T, VWW06-SW023-0211 T, VWW06-SW023P-0211 T, VWW06-SW018-0211 D, VWW06-SW020-0211 D, VWW06-SW023P-0211 D	arsenic	+J	U at LOD	MBL
VWW06-SW021-0211 T	iron	+J	U at LOD	MBL
VWW06-SW023P-0211 T, VWW06-SW022-0211 T, VWW06-SW020-0211 T	thallium	+J	U at LOD	MBL
VWW06-SW023-0211 T, VWW06-SW022-0211 T, VWW06-SW021-0211 T	vanadium	+J	U at LOD	MBL

Summary of Data Qualifications

Total & Dissolved Metals, continued

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SW023-0211 D, VWW06-SW022-0211 D, VWW06-SW018-0211 D	aluminum	+J	U at LOD	MBL
all soil samples*	aluminum calcium copper iron magnesium manganese potassium vanadium zinc	+/-	J/UJ	MDP
VWW06-SW023-0211 T, VWW06-SW023P-0211 T, VWW06-SW023-0211 D, VWW06-SW023P-0211 D	mercury	+/-	J/UJ	OT
all total field water samples	aluminum	+/-	R	SD
all total field water samples	iron	+/-	J/UJ	SD
all dissolved field water samples	calcium magnesium potassium	+/-	R	SD
all samples	all analytes	+B	J	

**final qualifier due to high moisture content except for analytes flagged U at LOD due to blank contamination. For these analytes the final qualifier code is MBL – but J is added to indicate estimation due to high %moisture levels.*

Hexavalent Chromium

Sample ID	Analyte	Results	Q flag	Q Code
all total and dissolved samples with exception of sample VWW06-SW018-0211 total	hexavalent chromium	+/-	J/UJ	HT
all soil samples	hexavalent chromium	+/-	J/UJ	%SOL

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the FB result is less or greater than the RL.
R -	Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.
J -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

General Abbreviations

RL/LOD	reporting limit
PQL	practical quantitation limit
IDL	instrument detection limit
MDL	method detection limit
CRQL/LOQ	contract required quantitation limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416 Lab File ID: 2004-16.D

Sample wt/vol: 4.71 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1753

PercentSolids: 22.9 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	5.6	U	2.8	5.6	9.3
74-87-3	Chloromethane	3.5	U	1.8	3.5	9.3
75-01-4	Vinyl chloride	5.6	U	2.8	5.6	9.3
74-83-9	Bromomethane	9.3	U	5.6	9.3	9.3
75-00-3	Chloroethane	6.9	U	3.4	6.9	9.3
75-69-4	Trichlorofluoromethane	4.1	U	2	4.1	9.3
75-35-4	1,1-Dichloroethene	3.2	U	1.6	3.2	9.3
75-15-0	Carbon disulfide	11.9		7	9.3	9.3
75-09-2	Methylene chloride	11.1	U	5.6	11.1	23.2
156-60-5	trans-1,2-Dichloroethene	3.6	U	1.8	3.6	9.3
75-34-3	1,1-Dichloroethane	3.2	U	1.6	3.2	9.3
67-64-1	Acetone	196		6	12	46.4
156-59-2	cis-1,2-Dichloroethene	5.7	U	2.9	5.7	9.3
74-97-5	Bromochloromethane	8.3	U	4.2	8.3	9.3
78-93-3	2-Butanone	39.6	J	6.5	13	46.4
67-66-3	Chloroform	5	U	2.5	5	9.3
71-55-6	1,1,1-Trichloroethane	3	U	1.5	3	9.3
56-23-5	Carbon tetrachloride	5.6	U	2.8	5.6	9.3
71-43-2	Benzene	4.6	U	2.3	4.6	9.3
107-06-2	1,2-Dichloroethane	9.3	U	4.6	9.3	23.2
79-01-6	Trichloroethene	4.1	U	2	4.1	9.3
78-87-5	1,2-Dichloropropane	5.8	U	2.9	5.8	9.3
75-27-4	Bromodichloromethane	3	U	1.5	3	9.3
10061-01-5	cis-1,3-Dichloropropene	3.9	U	1.9	3.9	9.3
108-10-1	4-Methyl-2-pentanone	14.8	U	7.4	14.8	46.4
108-88-3	Toluene	1.8	J	1.3	2.7	9.3

exclude RE

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416 Lab File ID: 2004-16.D

Sample wt/vol: 4.71 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1753

PercentSolids: 22.9 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	9.3	U	4.6	9.3	9.3
79-00-5	1,1,2-Trichloroethane	7.6	U	3.8	7.6	9.3
127-18-4	Tetrachloroethene	11.6		4.3	8.6	9.3
591-78-6	2-Hexanone	12	U	6	12	46.4
124-48-1	Dibromochloromethane	4.3	U	2.1	4.3	9.3
106-93-4	1,2-Dibromoethane(EDB)	7.6	U	3.8	7.6	9.3
108-90-7	Chlorobenzene	3.2	U	1.6	3.2	9.3
100-41-4	Ethylbenzene	6.4	U	3.2	6.4	9.3
100-42-5	Styrene	2.6	U	1.3	2.6	9.3
75-25-2	Bromoform	4.3	U	2.1	4.3	9.3
98-82-8	Isopropylbenzene (Cumene)	5.6	U	2.8	5.6	9.3
79-34-5	1,1,2,2-Tetrachloroethane	5.5	U	2.7	5.5	9.3
541-73-1	1,3-Dichlorobenzene	4.2	U	2.1	4.2	23.2
106-46-7	1,4-Dichlorobenzene	6	U	3	6	23.2
95-50-1	1,2-Dichlorobenzene	5.2	U	2.6	5.2	23.2
96-12-8	1,2-Dibromo-3-chloropropane	23.2	U	13	23.2	23.2
120-82-1	1,2,4-Trichlorobenzene	5.8	U	2.9	5.8	23.2
87-61-6	1,2,3-Trichlorobenzene	5.6	U	2.8	5.6	23.2
1330-20-7	Xylene (total)	6.3	U	3.2	6.3	18.5
1634-04-4	MTBE	4	U	2	4	9.3
76-13-1	1,1,2-Trichlorotrifluoroethane	5.8	U	2.9	5.8	9.3
110-82-7	Cyclohexane	9.3	U	4.6	9.3	9.3
79-20-9	Methyl Acetate	18.5	U	9.3	18.5	23.2
108-87-2	Methyl Cyclohexane	4	U	2	4	9.3

exclude PE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD001-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416RE1 Lab File ID: 2004-16.D

Sample wt/vol: 5.78 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1650

PercentSolids: 22.9 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	4.5 UJ %SDL	U	2.3	4.5	7.6
74-87-3	Chloromethane	2.9	U	1.4	2.9	7.6
75-01-4	Vinyl chloride	4.5	U	2.3	4.5	7.6
74-83-9	Bromomethane	7.6	U	4.5	7.6	7.6
75-00-3	Chloroethane	5.6	U	2.8	5.6	7.6
75-69-4	Trichlorofluoromethane	3.3	U	1.7	3.3	7.6
75-35-4	1,1-Dichloroethene	2.6	U	1.3	2.6	7.6
75-15-0	Carbon disulfide	17 J		5.7	7.6	7.6
75-09-2	Methylene chloride	9.1 UJ	U	4.5	9.1	18.9
156-60-5	trans-1,2-Dichloroethene	2.9	U	1.5	2.9	7.6
75-34-3	1,1-Dichloroethane	2.6	U	1.3	2.6	7.6
67-64-1	Acetone	207 J		4.9	9.8	37.8
156-59-2	cis-1,2-Dichloroethene	4.7 UJ	U	2.3	4.7	7.6
74-97-5	Bromochloromethane	6.8 UJ	U	3.4	6.8	7.6
78-93-3	2-Butanone	30.5 J	U	5.3	10.6	37.8
67-66-3	Chloroform	4.1 UJ	U	2	4.1	7.6
71-55-6	1,1,1-Trichloroethane	2.4	U	1.2	2.4	7.6
56-23-5	Carbon tetrachloride	4.5	U	2.3	4.5	7.6
71-43-2	Benzene	3.8	U	1.9	3.8	7.6
107-06-2	1,2-Dichloroethane	7.6	U	3.8	7.6	18.9
79-01-6	Trichloroethene	3.3	U	1.7	3.3	7.6
78-87-5	1,2-Dichloropropane	4.8	U	2.4	4.8	7.6
75-27-4	Bromodichloromethane	2.4	U	1.2	2.4	7.6
10061-01-5	cis-1,3-Dichloropropene	3.2	U	1.6	3.2	7.6
108-10-1	4-Methyl-2-pentanone	12.1	U	6	12.1	37.8
108-88-3	Toluene	2.2	U	1.1	2.2	7.6

180311 1920

WW 041571

Form I

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD001-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416RE1 Lab File ID: 2004-16.D

Sample wt/vol: 5.78 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1650

PercentSolids: 22.9 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
10061-02-6	trans-1,3-Dichloropropene	7.6 UJ	U	3.8	7.6	7.6
79-00-5	1,1,2-Trichloroethane	6.2 UJ	U	3.1	6.2	7.6
127-18-4	Tetrachloroethene	12 J		3.5	7	7.6
591-78-6	2-Hexanone	9.8 UJ	U	4.9	9.8	37.8
124-48-1	Dibromochloromethane	3.5	U	1.7	3.5	7.6
106-93-4	1,2-Dibromoethane(EDB)	6.2	U	3.1	6.2	7.6
108-90-7	Chlorobenzene	2.6	U	1.3	2.6	7.6
100-41-4	Ethylbenzene	5.2	U	2.6	5.2	7.6
100-42-5	Styrene	2.1	U	1	2.1	7.6
75-25-2	Bromoform	3.5	U	1.7	3.5	7.6
98-82-8	Isopropylbenzene (Cumene)	4.5	U	2.3	4.5	7.6
79-34-5	1,1,2,2-Tetrachloroethane	4.4	U	2.2	4.4	7.6
541-73-1	1,3-Dichlorobenzene	3.4	U	1.7	3.4	18.9
106-46-7	1,4-Dichlorobenzene	4.9	U	2.4	4.9	18.9
95-50-1	1,2-Dichlorobenzene	4.2	U	2.1	4.2	18.9
96-12-8	1,2-Dibromo-3-chloropropane	18.9	U	10.6	18.9	18.9
120-82-1	1,2,4-Trichlorobenzene	4.8	U	2.4	4.8	18.9
87-61-6	1,2,3-Trichlorobenzene	4.6	U	2.3	4.6	18.9
1330-20-7	Xylene (total)	5.1	U	2.6	5.1	15.1
1634-04-4	MTBE	3.2	U	1.6	3.2	7.6
76-13-1	1,1,2-Trichlorotrifluoroethane	4.8	U	2.4	4.8	7.6
110-82-7	Cyclohexane	7.6	U	3.8	7.6	7.6
79-20-9	Methyl Acetate	15.1	U	7.6	15.1	18.9
108-87-2	Methyl Cyclohexane	3.2	U	1.6	3.2	7.6

% SOL

180311 1920

WW 041511

Form I

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417 Lab File ID: 2004-17.D

Sample wt/vol: 4.33 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1819

PercentSolids: 31.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	4.4	U	2.2	4.4	7.4
74-87-3	Chloromethane	2.8	U	1.4	2.8	7.4
75-01-4	Vinyl chloride	4.4	U	2.2	4.4	7.4
74-83-9	Bromomethane	7.4	U	4.4	7.4	7.4
75-00-3	Chloroethane	5.5	U	2.7	5.5	7.4
75-69-4	Trichlorofluoromethane	3.3	U	1.6	3.3	7.4
75-35-4	1,1-Dichloroethene	2.5	U	1.3	2.5	7.4
75-15-0	Carbon disulfide	7.4	U	5.6	7.4	7.4
75-09-2	Methylene chloride	8.9	U	4.4	8.9	18.6
156-60-5	trans-1,2-Dichloroethene	2.9	U	1.4	2.9	7.4
75-34-3	1,1-Dichloroethane	2.5	U	1.3	2.5	7.4
67-64-1	Acetone	101		4.8	9.6	37.1
156-59-2	cis-1,2-Dichloroethene	4.6	U	2.3	4.6	7.4
74-97-5	Bromochloromethane	6.7	U	3.3	6.7	7.4
78-93-3	2-Butanone	25.7	J	5.2	10.4	37.1
67-66-3	Chloroform	4	U	2	4	7.4
71-55-6	1,1,1-Trichloroethane	2.4	U	1.2	2.4	7.4
56-23-5	Carbon tetrachloride	4.4	U	2.2	4.4	7.4
71-43-2	Benzene	3.7	U	1.8	3.7	7.4
107-06-2	1,2-Dichloroethane	7.4	U	3.7	7.4	18.6
79-01-6	Trichloroethene	3.3	U	1.6	3.3	7.4
78-87-5	1,2-Dichloropropane	4.7	U	2.3	4.7	7.4
75-27-4	Bromodichloromethane	2.4	U	1.2	2.4	7.4
10061-01-5	cis-1,3-Dichloropropene	3.1	U	1.6	3.1	7.4
108-10-1	4-Methyl-2-pentanone	11.9	U	5.9	11.9	37.1
108-88-3	Toluene	2.2	U	1.1	2.2	7.4

excluded

180311 1920

Form I

D41511

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417 Lab File ID: 2004-17.D

Sample wt/vol: 4.33 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1819

PercentSolids: 31.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	7.4	U	3.7	7.4	7.4
79-00-5	1,1,2-Trichloroethane	6.1	U	3	6.1	7.4
127-18-4	Tetrachloroethene	8.5		3.4	6.9	7.4
591-78-6	2-Hexanone	9.6	U	4.8	9.6	37.1
124-48-1	Dibromochloromethane	3.4	U	1.7	3.4	7.4
106-93-4	1,2-Dibromoethane(EDB)	6.1	U	3	6.1	7.4
108-90-7	Chlorobenzene	2.6	U	1.3	2.6	7.4
100-41-4	Ethylbenzene	5.1	U	2.6	5.1	7.4
100-42-5	Styrene	2.1	U	1	2.1	7.4
75-25-2	Bromoform	3.4	U	1.7	3.4	7.4
98-82-8	Isopropylbenzene (Cumene)	4.4	U	2.2	4.4	7.4
79-34-5	1,1,2,2-Tetrachloroethane	4.4	U	2.2	4.4	7.4
541-73-1	1,3-Dichlorobenzene	3.3	U	1.7	3.3	18.6
106-46-7	1,4-Dichlorobenzene	4.8	U	2.4	4.8	18.6
95-50-1	1,2-Dichlorobenzene	4.2	U	2.1	4.2	18.6
96-12-8	1,2-Dibromo-3-chloropropane	18.6	U	10.4	18.6	18.6
120-82-1	1,2,4-Trichlorobenzene	4.7	U	2.3	4.7	18.6
87-61-6	1,2,3-Trichlorobenzene	4.5	U	2.3	4.5	18.6
1330-20-7	Xylene (total)	5	U	2.5	5	14.8
1634-04-4	MTBE	3.2	U	1.6	3.2	7.4
76-13-1	1,1,2-Trichlorotrifluoroethane	4.7	U	2.3	4.7	7.4
110-82-7	Cyclohexane	7.4	U	3.7	7.4	7.4
79-20-9	Methyl Acetate	14.8	U	7.4	14.8	18.6
108-87-2	Methyl Cyclohexane	3.2	U	1.6	3.2	7.4

exclude RE

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD002-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417RE1 Lab File ID: 2004-17.D

Sample wt/vol: 4.26 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1715

PercentSolids: 31.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	4.5 UJ 1.SOL	U	2.3	4.5	7.5
74-87-3	Chloromethane	2.9	U	1.4	2.9	7.5
75-01-4	Vinyl chloride	4.5	U	2.3	4.5	7.5
74-83-9	Bromomethane	7.5	U	4.5	7.5	7.5
75-00-3	Chloroethane	5.6	U	2.8	5.6	7.5
75-69-4	Trichlorofluoromethane	3.3	U	1.7	3.3	7.5
75-35-4	1,1-Dichloroethene	2.6	U	1.3	2.6	7.5
75-15-0	Carbon disulfide	9.5 J		5.7	7.5	7.5
75-09-2	Methylene chloride	9 UJ	U	4.5	9	18.9
156-60-5	trans-1,2-Dichloroethene	2.9	U	1.5	2.9	7.5
75-34-3	1,1-Dichloroethane	2.6	U	1.3	2.6	7.5
67-64-1	Acetone	104 J		4.9	9.8	37.7
156-59-2	cis-1,2-Dichloroethene	4.7 UJ	U	2.3	4.7	7.5
74-97-5	Bromochloromethane	6.8 UJ	U	3.4	6.8	7.5
78-93-3	2-Butanone	28.5 J	J	5.3	10.6	37.7
67-66-3	Chloroform	4.1 UJ	U	2	4.1	7.5
71-55-6	1,1,1-Trichloroethane	2.4	U	1.2	2.4	7.5
56-23-5	Carbon tetrachloride	4.5	U	2.3	4.5	7.5
71-43-2	Benzene	3.8	U	1.9	3.8	7.5
107-06-2	1,2-Dichloroethane	7.5	U	3.8	7.5	18.9
79-01-6	Trichloroethene	3.3	U	1.7	3.3	7.5
78-87-5	1,2-Dichloropropane	4.8	U	2.4	4.8	7.5
75-27-4	Bromodichloromethane	2.4	U	1.2	2.4	7.5
10061-01-5	cis-1,3-Dichloropropene	3.2	U	1.6	3.2	7.5
108-10-1	4-Methyl-2-pentanone	12.1	U	6	12.1	37.7
108-88-3	Toluene	2.2	U	1.1	2.2	7.5

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD002-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417RE1 Lab File ID: 2004-17.D

Sample wt/vol: 4.26 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/17/11 Time: 1715

PercentSolids: 31.1 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
10061-02-6	trans-1,3-Dichloropropene	7.5 UJ	U	3.8	7.5	7.5
79-00-5	1,1,2-Trichloroethane	6.2 UJ	U	3.1	6.2	7.5
127-18-4	Tetrachloroethene	10.3 J		3.5	7	7.5
591-78-6	2-Hexanone	9.8 UJ	U	4.9	9.8	37.7
124-48-1	Dibromochloromethane	3.5	U	1.7	3.5	7.5
106-93-4	1,2-Dibromoethane(EDB)	6.2	U	3.1	6.2	7.5
108-90-7	Chlorobenzene	2.6	U	1.3	2.6	7.5
100-41-4	Ethylbenzene	5.2	U	2.6	5.2	7.5
100-42-5	Styrene	2.1	U	1	2.1	7.5
75-25-2	Bromoform	3.5	U	1.7	3.5	7.5
98-82-8	Isopropylbenzene (Cumene)	4.5	U	2.3	4.5	7.5
79-34-5	1,1,2,2-Tetrachloroethane	4.4	U	2.2	4.4	7.5
541-73-1	1,3-Dichlorobenzene	3.4	U	1.7	3.4	18.9
106-46-7	1,4-Dichlorobenzene	4.9	U	2.4	4.9	18.9
95-50-1	1,2-Dichlorobenzene	4.2	U	2.1	4.2	18.9
96-12-8	1,2-Dibromo-3-chloropropane	18.9	U	10.6	18.9	18.9
120-82-1	1,2,4-Trichlorobenzene	4.8	U	2.4	4.8	18.9
87-61-6	1,2,3-Trichlorobenzene	4.6	U	2.3	4.6	18.9
1330-20-7	Xylene (total)	5.1	U	2.6	5.1	15.1
1634-04-4	MTBE	3.2	U	1.6	3.2	7.5
76-13-1	1,1,2-Trichlorotrifluoroethane	4.8	U	2.4	4.8	7.5
110-82-7	Cyclohexane	7.5	U	3.8	7.5	7.5
79-20-9	Methyl Acetate	15.1	U	7.5	15.1	18.9
108-87-2	Methyl Cyclohexane	3.2	U	1.6	3.2	7.5

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-020811

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200418 Lab File ID: 00418.D

Sample wt/vol: 5 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1512

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.44	J	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	0.88	J	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	2.6	U	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

180311 1920

VW 04/5/11

Form I

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-020811

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200418 Lab File ID: 00418.D

Sample wt/vol: 5 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1512

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416 Lab File ID: 00416.D

Sample wt/vol: 25.9 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 1 Date Extracted: 02/10/11

Level:(low/med) LOW Date Analyzed: 02/24/11 Time: 0738

PercentSolids: 22.9 decanted : Dilution Factor: 1

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	9 UJ	U	4.5	9	11.2
91-57-6	2-Methylnaphthalene	9	U	4.5	9	11.2
83-32-9	Acenaphthene	9	U	4.5	9	11.2
208-96-8	Acenaphthylene	9	U	4.5	9	11.2
120-12-7	Anthracene	9.9 J	J	4.5	9	11.2
56-55-3	Benzo(a)anthracene	10.1 J	J	4.7	9.4	11.2
50-32-8	Benzo(a)pyrene	11.2 UJ	U	6.1	11.2	11.2
205-99-2	Benzo(b)fluoranthene	11.2	U	6.4	11.2	11.2
191-24-2	Benzo(g,h,i)perylene	11.2	U	10.4	11.2	11.2
207-08-9	Benzo(k)fluoranthene	11.2	U	7.1	11.2	11.2
218-01-9	Chrysene	6.2 J	J	4.4	8.8	11.2
53-70-3	Dibenzo(a,h)anthracene	11.2 UJ	U	8.8	11.2	11.2
206-44-0	Fluoranthene	14.8 J		4.5	9	11.2
86-73-7	Fluorene	9 UJ	U	4.5	9	11.2
193-39-5	Indeno(1,2,3-cd)pyrene	11.2	U	10.1	11.2	11.2
91-20-3	Naphthalene	9	U	4.5	9	11.2
85-01-8	Phenanthrene	4.6 J	J	4.5	9	11.2
129-00-0	Pyrene	10 J	J	4.5	9	11.2

VW 041511

1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417 Lab File ID: 00417D10.D

Sample wt/vol: 25.6 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 1 Date Extracted: 02/10/11

Level:(low/med) LOW Date Analyzed: 02/21/11 Time: 2349

PercentSolids: 31.1 decanted : Dilution Factor: 10

Extraction: OTHER Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
90-12-0	1-Methylnaphthalene	66.8	UJ "/. SD U	33.4	66.8	83.6
91-57-6	2-Methylnaphthalene	66.8	U	33.4	66.8	83.6
83-32-9	Acenaphthene	66.8	U	33.4	66.8	83.6
208-96-8	Acenaphthylene	66.8	U	33.4	66.8	83.6
120-12-7	Anthracene	66.8	U	33.4	66.8	83.6
56-55-3	Benzo(a)anthracene	70.3	U	35.2	70.3	83.6
50-32-8	Benzo(a)pyrene	83.6	U	45.2	83.6	83.6
205-99-2	Benzo(b)fluoranthene	83.6	U	47.7	83.6	83.6
191-24-2	Benzo(g,h,i)perylene	83.6	U	77.9	83.6	83.6
207-08-9	Benzo(k)fluoranthene	83.6	U	52.8	83.6	83.6
218-01-9	Chrysene	65.3	U	32.6	65.3	83.6
53-70-3	Dibenzo(a,h)anthracene	83.6	U	65.3	83.6	83.6
206-44-0	Fluoranthene	66.8	U	33.4	66.8	83.6
86-73-7	Fluorene	66.8	U	33.4	66.8	83.6
193-39-5	Indeno(1,2,3-cd)pyrene	83.6	U	75.4	83.6	83.6
91-20-3	Naphthalene	66.8	U	33.4	66.8	83.6
85-01-8	Phenanthrene	66.8	U	33.4	66.8	83.6
129-00-0	Pyrene	66.8	U	33.4	66.8	83.6

VWW 041511

180311 1921

Form I

U24

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW023P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200401 Lab File ID: 2004-01.D

Sample wt/vol: 960 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 1622

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0017	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.009	U	0.0045	0.009	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.004	0.0079	0.052
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0017	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.52

4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW023-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200402 Lab File ID: 2004-02.D

Sample wt/vol: 960 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 1640

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0017	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.009	U	0.0045	0.009	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.004	0.0079	0.052
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0017	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.52

GPC 4571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW022-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200403 Lab File ID: 2004-03.D

Sample wt/vol: 970 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 1658

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.052
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.052
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.52

JMC 41571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW021-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200404 Lab File ID: 2004-04.D

Sample wt/vol: 960 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 1715

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0017	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.009	U	0.0045	0.009	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.004	0.0079	0.052
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0017	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.52

QAC 41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200405 Lab File ID: 2004-05.D

Sample wt/vol: 965 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 1733

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.025 J 2C ~~JP~~		0.0012	0.0025	0.052
319-86-8	delta-BHC	0.012	J	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005 ~~0.0032~~ U 2C ~~JP~~		0.0025	0.005	0.052
76-44-8	Heptachlor	0.0074 J 2C ~~JP~~		0.0041	0.0082	0.052
309-00-2	Aldrin	0.0046 NJ 2C ~~JP~~		0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.038	J	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.049	J	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.049	J	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.07		0.0039	0.0079	0.052
72-20-8	Endrin	0.055		0.0019	0.0037	0.052
33213-65-9	Endosulfan II	0.04	J	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.05	J	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.026	J	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.086		0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.063		0.0019	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0053 J 2C ~~JP~~		0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.026 J 2C ~~JP~~		0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.045	J	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.029	J	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.19	0.37	0.52

JC 41911

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW019-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200406 Lab File ID: 2004-06.D

Sample wt/vol: 965 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 1751

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0079	U	0.0039	0.0079	0.052
72-20-8	Endrin	0.0037	U	0.0019	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0019	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0016	0.0031	0.052
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.19	0.37	0.52

JC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW020-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200407 Lab File ID: 2004-07.D

Sample wt/vol: 970 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 1937

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.052
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.052
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.52

JMC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020811

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200408 Lab File ID: 2004-08.D

Sample wt/vol: 970 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 1955

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.052
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.052
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.052
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.052
76-44-8	Heptachlor	0.0082	U	0.0041	0.0082	0.052
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.052
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.052
959-98-8	Endosulfan I	0.0089	U	0.0044	0.0089	0.052
60-57-1	Dieldrin	0.0056	U	0.0028	0.0056	0.052
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.052
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.052
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.052
72-54-8	4,4'-DDD	0.0054	U	0.0027	0.0054	0.052
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.052
50-29-3	4,4'-DDT	0.0023	U	0.0011	0.0023	0.052
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.052
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.052
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.052
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.052
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.052
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.52

JAE 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB02-020811

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200409 Lab File ID: 2007-09.D

Sample wt/vol: 950 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/22/11 Time: 2013

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0063	U	0.0032	0.0063	0.053
319-85-7	beta-BHC	0.0025	U	0.0013	0.0025	0.053
319-86-8	delta-BHC	0.0063	U	0.0032	0.0063	0.053
58-89-9	gamma-BHC (Lindane)	0.005	U	0.0025	0.005	0.053
76-44-8	Heptachlor	0.0083	U	0.0042	0.0083	0.053
309-00-2	Aldrin	0.0034	U	0.0017	0.0034	0.053
1024-57-3	Heptachlor epoxide	0.0029	U	0.0015	0.0029	0.053
959-98-8	Endosulfan I	0.009	U	0.0045	0.009	0.053
60-57-1	Dieldrin	0.0057	U	0.0028	0.0057	0.053
72-55-9	4,4'-DDE	0.008	U	0.004	0.008	0.053
72-20-8	Endrin	0.0038	U	0.0019	0.0038	0.053
33213-65-9	Endosulfan II	0.0034	U	0.0017	0.0034	0.053
72-54-8	4,4'-DDD	0.0055	U	0.0027	0.0055	0.053
1031-07-8	Endosulfan sulfate	0.0021	U	0.001	0.0021	0.053
50-29-3	4,4'-DDT	0.0023	U	0.0012	0.0023	0.053
72-43-5	Methoxychlor	0.0038	U	0.0019	0.0038	0.053
7421-93-4	Endrin aldehyde	0.0032	U	0.0016	0.0032	0.053
5103-74-2	gamma-Chlordane	0.005	U	0.0025	0.005	0.053
5103-71-9	alpha-Chlordane	0.0063	U	0.0032	0.0063	0.053
53494-70-5	Endrin ketone	0.013	U	0.0063	0.013	0.053
8001-35-2	Toxaphene	0.38	U	0.19	0.38	0.53

4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD014-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200412 Lab File ID: 2004-12.D

Sample wt/vol: 33.11 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1446

PercentSolids: 18 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	5 UJ %Sol	U	3.2	5	5
319-85-7	beta-BHC	1	U	0.5	1	5
319-86-8	delta-BHC	1.9	U	0.94	1.9	5
58-89-9	gamma-BHC (Lindane)	1.3	U	0.67	1.3	5
76-44-8	Heptachlor	1.3	U	0.67	1.3	5
309-00-2	Aldrin	1	U	0.5	1	5
1024-57-3	Heptachlor epoxide	1	U	0.5	1	5
959-98-8	Endosulfan I	1.5	U	0.74	1.5	5
60-57-1	Dieldrin	1.1	U	0.54	1.1	5
72-55-9	4,4'-DDE	1.3 J	J	0.91	1.8	5
72-20-8	Endrin	1.7 UJ	U	0.87	1.7	5
33213-65-9	Endosulfan II	1.9	U	0.97	1.9	5
72-54-8	4,4'-DDD	3.4	U	1.7	3.4	5
1031-07-8	Endosulfan sulfate	1.3	U	0.67	1.3	5
50-29-3	4,4'-DDT	2.6	U	1.3	2.6	5
72-43-5	Methoxychlor	1.8	U	0.91	1.8	5
7421-93-4	Endrin aldehyde	2.4	U	1.2	2.4	5
5103-74-2	gamma-Chlordane	1.1	U	0.57	1.1	5
5103-71-9	alpha-Chlordane	1.1	U	0.54	1.1	5
53494-70-5	Endrin ketone	1.4	U	0.7	1.4	5
8001-35-2	Toxaphene	170	U	110	170	170

4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD015-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200413 Lab File ID: 2004-13.D

Sample wt/vol: 33.16 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1503

PercentSolids: 28.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	3.2	U	2	3.2	3.2
319-85-7	beta-BHC	0.64	U	0.32	0.64	3.2
319-86-8	delta-BHC	1.2	U	0.59	1.2	3.2
58-89-9	gamma-BHC (Lindane)	0.85	U	0.42	0.85	3.2
76-44-8	Heptachlor	0.85	U	0.42	0.85	3.2
309-00-2	Aldrin	0.64	U	0.32	0.64	3.2
1024-57-3	Heptachlor epoxide	0.64	U	0.32	0.64	3.2
959-98-8	Endosulfan I	0.93	U	0.47	0.93	3.2
60-57-1	Dieldrin	0.68	U	0.34	0.68	3.2
72-55-9	4,4'-DDE	1.1	U	0.57	1.1	3.2
72-20-8	Endrin	1.1	U	0.55	1.1	3.2
33213-65-9	Endosulfan II	1.2	U	0.62	1.2	3.2
72-54-8	4,4'-DDD	2.2	U	1.1	2.2	3.2
1031-07-8	Endosulfan sulfate	0.85	U	0.42	0.85	3.2
50-29-3	4,4'-DDT	1.6	U	0.81	1.6	3.2
72-43-5	Methoxychlor	1.1	U	0.57	1.1	3.2
7421-93-4	Endrin aldehyde	1.5	U	0.76	1.5	3.2
5103-74-2	gamma-Chlordane	0.72	U	0.36	0.72	3.2
5103-71-9	alpha-Chlordane	0.68	U	0.34	0.68	3.2
53494-70-5	Endrin ketone	0.89	U	0.44	0.89	3.2
8001-35-2	Toxaphene	110	U	71	110	110

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD016-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200414 Lab File ID: 2004-14.D

Sample wt/vol: 33.2 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1521

PercentSolids: 19.7 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	4.6	U	2.9	4.6	4.6
319-85-7	beta-BHC	0.92	U	0.46	0.92	4.6
319-86-8	delta-BHC	1.7	U	0.86	1.7	4.6
58-89-9	gamma-BHC (Lindane)	1.2	U	0.61	1.2	4.6
76-44-8	Heptachlor	1.2	U	0.61	1.2	4.6
309-00-2	Aldrin	0.92	U	0.46	0.92	4.6
1024-57-3	Heptachlor epoxide	0.92	U	0.46	0.92	4.6
959-98-8	Endosulfan I	1.3	U	0.67	1.3	4.6
60-57-1	Dieldrin	0.98	U	0.49	0.98	4.6
72-55-9	4,4'-DDE	1.6	U	0.82	1.6	4.6
72-20-8	Endrin	1.6	U	0.8	1.6	4.6
33213-65-9	Endosulfan II	1.8	U	0.89	1.8	4.6
72-54-8	4,4'-DDD	3.1	U	1.6	3.1	4.6
1031-07-8	Endosulfan sulfate	1.2	U	0.61	1.2	4.6
50-29-3	4,4'-DDT	2.3	U	1.2	2.3	4.6
72-43-5	Methoxychlor	1.6	U	0.82	1.6	4.6
7421-93-4	Endrin aldehyde	2.2	U	1.1	2.2	4.6
5103-74-2	gamma-Chlordane	1	U	0.52	1	4.6
5103-71-9	alpha-Chlordane	0.98	U	0.49	0.98	4.6
53494-70-5	Endrin ketone	1.3	U	0.64	1.3	4.6
8001-35-2	Toxaphene	150	U	100	150	150

WJ %Sol

QC 4/5/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD017-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200415 Lab File ID: 2004-15.D

Sample wt/vol: 33.4 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1539

PercentSolids: 16.2 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	5.5 UJ %501	U	3.5	5.5	5.5
319-85-7	beta-BHC	1.1	U	0.55	1.1	5.5
319-86-8	delta-BHC	2.1	U	1	2.1	5.5
58-89-9	gamma-BHC (Lindane)	1.5	U	0.74	1.5	5.5
76-44-8	Heptachlor	1.5	U	0.74	1.5	5.5
309-00-2	Aldrin	1.1	U	0.55	1.1	5.5
1024-57-3	Heptachlor epoxide	1.1	U	0.55	1.1	5.5
959-98-8	Endosulfan I	1.6	U	0.81	1.6	5.5
60-57-1	Dieldrin	1.2	U	0.59	1.2	5.5
72-55-9	4,4'-DDE	2	U	1	2	5.5
72-20-8	Endrin	1.9	U	0.96	1.9	5.5
33213-65-9	Endosulfan II	2.1	U	1.1	2.1	5.5
72-54-8	4,4'-DDD	3.8	U	1.9	3.8	5.5
1031-07-8	Endosulfan sulfate	1.5	U	0.74	1.5	5.5
50-29-3	4,4'-DDT	2.8	U	1.4	2.8	5.5
72-43-5	Methoxychlor	2	U	1	2	5.5
7421-93-4	Endrin aldehyde	2.7	U	1.3	2.7	5.5
5103-74-2	gamma-Chlordane	1.2	U	0.63	1.2	5.5
5103-71-9	alpha-Chlordane	1.2	U	0.59	1.2	5.5
53494-70-5	Endrin ketone	1.6	U	0.78	1.6	5.5
8001-35-2	Toxaphene	180	U	120	180	180

JAC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code: PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416 Lab File ID: 2004-16.D

Sample wt/vol: 33.96 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1557

PercentSolids: 22.9 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	3.8	U	2.5	3.8	3.8
319-85-7	beta-BHC	0.77	U	0.38	0.77	3.8
319-86-8	delta-BHC	1.4	U	0.72	1.4	3.8
58-89-9	gamma-BHC (Lindane)	1	U	0.51	1	3.8
76-44-8	Heptachlor	1	U	0.51	1	3.8
309-00-2	Aldrin	0.77	U	0.38	0.77	3.8
1024-57-3	Heptachlor epoxide	0.77	U	0.38	0.77	3.8
959-98-8	Endosulfan I	1.1	U	0.56	1.1	3.8
60-57-1	Dieldrin	0.82	U	0.41	0.82	3.8
72-55-9	4,4'-DDE	1.4	U	0.69	1.4	3.8
72-20-8	Endrin	1.3	U	0.67	1.3	3.8
33213-65-9	Endosulfan II	1.5	U	0.74	1.5	3.8
72-54-8	4,4'-DDD	2.6	U	1.3	2.6	3.8
1031-07-8	Endosulfan sulfate	1	U	0.51	1	3.8
50-29-3	4,4'-DDT	2	U	0.98	2	3.8
72-43-5	Methoxychlor	1.4	U	0.69	1.4	3.8
7421-93-4	Endrin aldehyde	1.8	U	0.92	1.8	3.8
5103-74-2	gamma-Chlordane	0.87	U	0.44	0.87	3.8
5103-71-9	alpha-Chlordane	0.82	U	0.41	0.82	3.8
53494-70-5	Endrin ketone	1.1	U	0.54	1.1	3.8
8001-35-2	Toxaphene	130	U	86	130	130

40 %Sol

JAC 41571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417 Lab File ID: 04-17.D

Sample wt/vol: 33.35 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/25/11 Time: 1014

PercentSolids: 31.1 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	2.9 UJ %Sol	U	1.8	2.9	2.9
319-85-7	beta-BHC	0.58	U	0.29	0.58	2.9
319-86-8	delta-BHC	1.1	U	0.54	1.1	2.9
58-89-9	gamma-BHC (Lindane)	0.77	U	0.38	0.77	2.9
76-44-8	Heptachlor	0.77	U	0.38	0.77	2.9
309-00-2	Aldrin	0.58	U	0.29	0.58	2.9
1024-57-3	Heptachlor epoxide	0.58	U	0.29	0.58	2.9
959-98-8	Endosulfan I	0.85	U	0.42	0.85	2.9
60-57-1	Dieldrin	0.62	U	0.31	0.62	2.9
72-55-9	4,4'-DDE	1.1	JP	0.52	1	2.9
72-20-8	Endrin	1	U	0.5	1	2.9
33213-65-9	Endosulfan II	1.1	U	0.56	1.1	2.9
72-54-8	4,4'-DDD	1.5	J	0.98	2	2.9
1031-07-8	Endosulfan sulfate	0.77	U	0.38	0.77	2.9
50-29-3	4,4'-DDT	1.5	U	0.73	1.5	2.9
72-43-5	Methoxychlor	1	U	0.52	1	2.9
7421-93-4	Endrin aldehyde	1.4	U	0.69	1.4	2.9
5103-74-2	gamma-Chlordane	0.66	U	0.33	0.66	2.9
5103-71-9	alpha-Chlordane	0.62	U	0.31	0.62	2.9
53494-70-5	Endrin ketone	0.81	U	0.4	0.81	2.9
8001-35-2	Toxaphene	96	U	64	96	96

QAC 41571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW023P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200401 Lab File ID: 2004-01.D

Sample wt/vol: 960 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1206

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.017	U	0.0083	0.017	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.01	U	0.005	0.01	0.021

JAC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW023-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200402 Lab File ID: 2004-02.D

Sample wt/vol: 965 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1221

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0083	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.01	U	0.005	0.01	0.021

JDC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW022-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200403 Lab File ID: 2004-03.D

Sample wt/vol: 970 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1236

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

JMC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW021-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200404 Lab File ID: 2004-04.D

Sample wt/vol: 975 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1251

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.02	U	0.015	0.02	0.02
11096-82-5	Aroclor-1260	0.02	U	0.01	0.02	0.02
11104-28-2	Aroclor-1221	0.02	U	0.018	0.02	0.02
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.02
53469-21-9	Aroclor-1242	0.02	U	0.013	0.02	0.02
12672-29-6	Aroclor-1248	0.011	U	0.0053	0.011	0.02
11097-69-1	Aroclor-1254	0.0098	U	0.0049	0.0098	0.02

jjc 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200405 Lab File ID: 2004-05.D

Sample wt/vol: 975 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1306

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.02	U	0.015	0.02	0.02
11096-82-5	Aroclor-1260	0.02	U	0.01	0.02	0.02
11104-28-2	Aroclor-1221	0.02	U	0.018	0.02	0.02
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.02
53469-21-9	Aroclor-1242	0.02	U	0.013	0.02	0.02
12672-29-6	Aroclor-1248	0.011	U	0.0053	0.011	0.02
11097-69-1	Aroclor-1254	0.0098	U	0.0049	0.0098	0.02

JLC 4/5/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW019-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200406 Lab File ID: 2004-06.D

Sample wt/vol: 970 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1321

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

SMC 4571

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW020-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200407 Lab File ID: 2004-07.D

Sample wt/vol: 970 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1336

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

JMC 41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-020811

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200408 Lab File ID: 2004-08.D

Sample wt/vol: 970 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1422

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.021	U	0.015	0.021	0.021
11096-82-5	Aroclor-1260	0.021	U	0.01	0.021	0.021
11104-28-2	Aroclor-1221	0.021	U	0.018	0.021	0.021
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.021
53469-21-9	Aroclor-1242	0.021	U	0.013	0.021	0.021
12672-29-6	Aroclor-1248	0.011	U	0.0054	0.011	0.021
11097-69-1	Aroclor-1254	0.0099	U	0.0049	0.0099	0.021

JC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

1

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB02-020811

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200409 Lab File ID: 2004-09.D

Sample wt/vol: 975 Units: ML Date Received: 02/09/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1437

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.02	U	0.015	0.02	0.02
11096-82-5	Aroclor-1260	0.02	U	0.01	0.02	0.02
11104-28-2	Aroclor-1221	0.02	U	0.018	0.02	0.02
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.02
53469-21-9	Aroclor-1242	0.02	U	0.013	0.02	0.02
12672-29-6	Aroclor-1248	0.011	U	0.0053	0.011	0.02
11097-69-1	Aroclor-1254	0.0098	U	0.0049	0.0098	0.02

JMC 4511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SS012-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200410 Lab File ID: 004-10.D

Sample wt/vol: 33.26 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1314

PercentSolids: 83.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	19	U	9.4	19	22
11096-82-5	Aroclor-1260	8.8	U	4.4	8.8	22
11104-28-2	Aroclor-1221	17	U	8.6	17	22
11141-16-5	Aroclor-1232	22	U	14	22	22
53469-21-9	Aroclor-1242	16	U	7.9	16	22
12672-29-6	Aroclor-1248	16	U	7.9	16	22
11097-69-1	Aroclor-1254	98		6.8	14	22

JAC 41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SS013-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200411 Lab File ID: 4-11.D

Sample wt/vol: 33.94 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 2122

PercentSolids: 71.2 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	22	U	11	22	25
11096-82-5	Aroclor-1260	10	U	5	10	25
11104-28-2	Aroclor-1221	20	U	9.9	20	25
11141-16-5	Aroclor-1232	25	U	16	25	25
53469-21-9	Aroclor-1242	18	U	9.1	18	25
12672-29-6	Aroclor-1248	18	U	9.1	18	25
11097-69-1	Aroclor-1254	16	U	7.9	16	25

JC 41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD014-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200412 Lab File ID: 4-12.D

Sample wt/vol: 33.11 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 2137

PercentSolids: 18 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
12674-11-2	Aroclor-1016	87	U	44	87	100
11096-82-5	Aroclor-1260	41	U	20	41	100
11104-28-2	Aroclor-1221	80	U	40	80	100
11141-16-5	Aroclor-1232	100	U	67	100	100
53469-21-9	Aroclor-1242	74	U	37	74	100
12672-29-6	Aroclor-1248	74	U	37	74	100
11097-69-1	Aroclor-1254	64	U	32	64	100

UG/KG %Sol

JMC 41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD015-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200413 Lab File ID: 4-13.D

Sample wt/vol: 33.16 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 2152

PercentSolids: 28.4 decanted : _____ Dilution Factor: 1

Extraction: SONC Station ID: _____ Method: 8082

GPC Cleanup : (Y/N) N pH: _____

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	55 UJ %Sol	U	28	55	64
11096-82-5	Aroclor-1260	26	U	13	26	64
11104-28-2	Aroclor-1221	51	U	25	51	64
11141-16-5	Aroclor-1232	64	U	42	64	64
53469-21-9	Aroclor-1242	47	U	23	47	64
12672-29-6	Aroclor-1248	47	U	23	47	64
11097-69-1	Aroclor-1254	40	U	20	40	64

JAC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD016-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200414 Lab File ID: 4-14.D

Sample wt/vol: 33.2 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 2207

PercentSolids: 19.7 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	80	U	40	80	92
11096-82-5	Aroclor-1260	37	U	19	37	92
11104-28-2	Aroclor-1221	73	U	37	73	92
11141-16-5	Aroclor-1232	92	U	61	92	92
53469-21-9	Aroclor-1242	67	U	34	67	92
12672-29-6	Aroclor-1248	67	U	34	67	92
11097-69-1	Aroclor-1254	58	U	29	58	92

4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD017-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200415 Lab File ID: 4-15.D

Sample wt/vol: 33.4 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 2223

PercentSolids: 16.2 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
12674-11-2	Aroclor-1016	96 UJ 250	U	48	96	110
11096-82-5	Aroclor-1260	45	U	22	45	110
11104-28-2	Aroclor-1221	89	U	44	89	110
11141-16-5	Aroclor-1232	110	U	74	110	110
53469-21-9	Aroclor-1242	81	U	41	81	110
12672-29-6	Aroclor-1248	81	U	41	81	110
11097-69-1	Aroclor-1254	70	U	35	70	110

JLC 4/15/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD001-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416 Lab File ID: 4-16.D

Sample wt/vol: 33.96 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 2238

PercentSolids: 22.9 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	67 UJ %Sd	U	33	67	77
11096-82-5	Aroclor-1260	31	U	16	31	77
11104-28-2	Aroclor-1221	62	U	31	62	77
11141-16-5	Aroclor-1232	77	U	51	77	77
53469-21-9	Aroclor-1242	56	U	28	56	77
12672-29-6	Aroclor-1248	56	U	28	56	77
11097-69-1	Aroclor-1254	49	U	24	49	77

JLC 41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD002-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417 Lab File ID: 4-17.D

Sample wt/vol: 33.35 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/11/11 Time: 2253

PercentSolids: 31.1 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	50	U	25	50	58
11096-82-5	Aroclor-1260	24	U	12	24	58
11104-28-2	Aroclor-1221	46	U	23	46	58
11141-16-5	Aroclor-1232	58	U	38	58	58
53469-21-9	Aroclor-1242	42	U	21	42	58
12672-29-6	Aroclor-1248	42	U	21	42	58
11097-69-1	Aroclor-1254	37	U	18	37	58

wt %Sol

GPC 4151

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SS013P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200419 Lab File ID: 004-19.D

Sample wt/vol: 33.75 Units: G Date Received: 02/09/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1329

PercentSolids: 68.9 decanted : (_____ Dilution Factor: 1

Extraction: SONC Station ID: _____ Method: 8082

GPC Cleanup : (Y/N) N pH: _____

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	22	U	11	22	26
11096-82-5	Aroclor-1260	10	U	5.2	10	26
11104-28-2	Aroclor-1221	21	U	10	21	26
11141-16-5	Aroclor-1232	26	U	17	26	26
53469-21-9	Aroclor-1242	19	U	9.5	19	26
12672-29-6	Aroclor-1248	19	U	9.5	19	26
11097-69-1	Aroclor-1254	16	U	8.2	16	26

JAC 41511

Results reported on Primary Column, if RPD >40% results flagged accordingly.

040411 1448

Form I

057

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200401

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~586~~	~~J~~	R SD	P	93	186	1000
7440-39-3	Barium	9.64	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	425000			P	390	780	1000
7439-89-6	Iron	227	~~J~~	J SD	P	55	110	400
7439-95-4	Magnesium	1320000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0405	J	J OT	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	430000			P	717	1430	5000
7782-49-2	Selenium	82	U		P	41	82	90
7440-28-0	Thallium	~~53.7~~ 88	~~J~~	U MBL	P	44	88	100
7440-62-2	Vanadium	5.46	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JMC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

056

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023P-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200401DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10800000			P	9000	15000	15000

JJC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200402

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~640~~	~~J~~	R-E-SD	P	93	186	1000
7440-39-3	Barium	10.3	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	425000			P	390	780	1000
7439-89-6	Iron	314	~~J~~	J E SD	P	55	110	400
7439-95-4	Magnesium	1300000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	~~U~~	UJ OT	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	429000			P	717	1430	5000
7782-49-2	Selenium	82	U		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	~~4.5~~ 8.8	~~J~~	U MDL	P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JMC 41571

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1923

U60

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200402DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10800000			P	9000	15000	15000

4157

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

160311 1023

061

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW022-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200403

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~602~~	J	R SD	P	93	186	1000
7440-39-3	Barium	10.5	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	427000			P	390	780	1000
7439-89-6	Iron	176	J	J SD	P	55	110	400
7439-95-4	Magnesium	1300000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	436000			P	717	1430	5000
7782-49-2	Selenium	49.3	J		P	41	82	90
7440-28-0	Thallium	~~49.6~~ 8.8	J	U MBL	P	44	88	100
7440-62-2	Vanadium	~~4.65~~ 8.8	J	U MBL	P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JMC 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

160311 1923

062

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW022-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200403DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11000000			P	9000	15000	15000

JMC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

160311 1923

663

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW021-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200404

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~490~~	J	R SD	P	93	186	1000
7440-39-3	Barium	8.47	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	427000			P	390	780	1000
7439-89-6	Iron	~~97.5~~ 110	J	UJ MBL	P	55	110	400
7439-95-4	Magnesium	1310000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	435000			P	717	1430	5000
7782-49-2	Selenium	103			P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	~~5.09~~ 8.8	J	U MBL	P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1923

064

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW021-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200404DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11000000			P	9000	15000	15000

JAC 4157

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200405

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~1240~~		R SD	P	93	186	1000
7440-39-3	Barium	9.84	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	421000			P	390	780	1000
7439-89-6	Iron	635		J SD	P	55	110	400
7439-95-4	Magnesium	1310000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	433000			P	717	1430	5000
7782-49-2	Selenium	84.2	J		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	5.9	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

qjc 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

160311 1923

066

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW018-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200405DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11000000			P	9000	15000	15000

JAC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1023

067

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW019-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200406

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: *UG/L*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	2030.		RSD	P	93	186	1000
7440-39-3	Barium	13	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	424000			P	390	780	1000
7439-89-6	Iron	1660		J SD	P	55	110	400
7439-95-4	Magnesium	1320000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	437000			P	717	1430	5000
7782-49-2	Selenium	89.6	J		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	7.77	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

160311 1923

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW019-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200406DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11200000			P	9000	15000	15000

jdc 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

160311 1523

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW020-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200407

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~800~~	J	R SD	P	93	186	1000
7440-39-3	Barium	10.6	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	410000			P	390	780	1000
7439-89-6	Iron	331	J	J SD	P	55	110	400
7439-95-4	Magnesium	1290000			P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0426	J		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	421000			P	717	1430	5000
7782-49-2	Selenium	54.9	J		P	41	82	90
7440-28-0	Thallium	~~53.9~~ 88	J	U MBL	P	44	88	100
7440-62-2	Vanadium	4.98	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

070

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW020-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200407DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11100000			P	9000	15000	15000

4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

071

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD014-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200412

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 18 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	8470000		J %Sol	P	5280	10600	27800
7440-36-0	Antimony	1330	U	UJ	P	667	1330	2780
7440-39-3	Barium	8210		J	P	445	890	1390
7440-41-7	Beryllium	890	U	UJ	P	445	890	1390
7440-43-9	Cadmium	175	J	J	P	139	278	1390
7440-70-2	Calcium	30900000			P	9180	18400	27800
7440-48-4	Cobalt	3810			P	139	278	1390
7440-50-8	Copper	29700			P	445	890	1390
7439-89-6	Iron	10400000			P	1670	3340	13900
7439-92-1	Lead	3940			P	945	1890	2220
7439-95-4	Magnesium	13000000			P	8060	16100	27800
7439-96-5	Manganese	159000			P	445	890	1390
7439-97-6	Mercury	98.8			CV	10.3	20.6	55.6
7440-02-0	Nickel	7150			P	445	890	1390
7440-09-7	Potassium	3720000			P	13900	27800	139000
7440-22-4	Silver	890	U	UJ	P	445	890	1390
7440-28-0	Thallium	1890	U	UJ	P	945	1890	2780
7440-62-2	Vanadium	29400		J	P	445	890	1390
7440-66-6	Zinc	40400		J	P	918	1840	2780

JWC 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

072

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD014-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200412DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 18 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	62000000		J %S)	P	55600	111000	167000

JAC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

073

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD015-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200413

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 28.4 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	9890000		J %Sol	P	3520	7040	18500
7440-36-0	Antimony	890	U	UJ	P	445	890	1850
7440-39-3	Barium	7110		J	P	296	593	927
7440-41-7	Beryllium	593	U	UJ	P	296	593	927
7440-43-9	Cadmium	185	U	UJ	P	92.7	185	927
7440-70-2	Calcium	14000000		J	P	6120	12200	18500
7440-48-4	Cobalt	3940			P	92.7	185	927
7440-50-8	Copper	23400			P	296	593	927
7439-89-6	Iron	9300000			P	1110	2220	9270
7439-92-1	Lead	4640			P	630	1260	1480
7439-95-4	Magnesium	9920000			P	5370	10700	18500
7439-96-5	Manganese	115000			P	296	593	927
7439-97-6	Mercury	66.9			CV	6.86	13.7	37.1
7440-02-0	Nickel	7300			P	296	593	927
7440-09-7	Potassium	2750000			P	9270	18500	92700
7440-22-4	Silver	593	U	UJ	P	296	593	927
7440-23-5	Sodium	39400000		J	P	18500	37100	55600
7440-28-0	Thallium	1260	U	UJ	P	630	1260	1850
7440-62-2	Vanadium	42400		J	P	296	593	927
7440-66-6	Zinc	42200		J	P	612	1220	1850

JAC 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

U74

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD016-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200414

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 19.7 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	7980000		J 25J	P	5360	10700	28200
7440-36-0	Antimony	1350	U	UJ	P	677	1350	2820
7440-39-3	Barium	9600		J	P	451	902	1410
7440-41-7	Beryllium	902	U	UJ	P	451	902	1410
7440-43-9	Cadmium	282	U	UJ	P	141	282	1410
7440-70-2	Calcium	17600000		J	P	9310	18600	28200
7440-48-4	Cobalt	3300		J	P	141	282	1410
7440-50-8	Copper	37100		J	P	451	902	1410
7439-89-6	Iron	14400000		J	P	1690	3380	14100
7439-92-1	Lead	6380		J	P	959	1920	2260
7439-95-4	Magnesium	11000000		J	P	8180	16400	28200
7439-96-5	Manganese	196000		J	P	451	902	1410
7439-97-6	Mercury	131		J	CV	10.4	20.9	56.4
7440-02-0	Nickel	5800		J	P	451	902	1410
7440-09-7	Potassium	3260000		J	P	14100	28200	141000
7440-22-4	Silver	902	U	UJ	P	451	902	1410
7440-23-5	Sodium	56700000		J	P	28200	56400	84600
7440-28-0	Thallium	1920	U	UJ	P	959	1920	2820
7440-62-2	Vanadium	20700		J	P	451	902	1410
7440-66-6	Zinc	31900		J	P	931	1860	2820

jdc 41511

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1023

076

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD017-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200415

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 16.2 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	10600000		J %SD	P	5960	11900	31400
7440-36-0	Antimony	1510	U	UJ	P	754	1510	3140
7440-39-3	Barium	11300		J	P	502	1000	1570
7440-41-7	Beryllium	1000	U	UJ	P	502	1000	1570
7440-43-9	Cadmium	314	U	UJ	P	157	314	1570
7440-70-2	Calcium	11400000		J	P	10400	20700	31400
7440-48-4	Cobalt	4470			P	157	314	1570
7440-50-8	Copper	28500			P	502	1000	1570
7439-89-6	Iron	8870000			P	1880	3770	15700
7439-92-1	Lead	7080			P	1070	2140	2510
7439-95-4	Magnesium	15800000			P	9100	18200	31400
7439-96-5	Manganese	63000			P	502	1000	1570
7439-97-6	Mercury	77.1			CV	11.7	23.4	63.1
7440-02-0	Nickel	5160			P	502	1000	1570
7440-09-7	Potassium	4190000			P	15700	31400	157000
7440-22-4	Silver	1000	U	UJ	P	502	1000	1570
7440-23-5	Sodium	74700000		J	P	31400	62800	94200
7440-28-0	Thallium	2140	U	UJ	P	1070	2140	3140
7440-62-2	Vanadium	58600		J	P	502	1000	1570
7440-66-6	Zinc	34900		J	P	1040	2070	3140

JAC 41571

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1923

076

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD001-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 22.9 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	14500000		J 0.01	P	4350	8710	22900
7440-36-0	Antimony	1100	U	UJ	P	550	1100	2290
7440-39-3	Barium	12200		J	P	366	733	1140
7440-41-7	Beryllium	733	U	UJ	P	366	733	1140
7440-43-9	Cadmium	302	U	J	P	114	229	1140
7440-70-2	Calcium	101000000			P	7560	15100	22900
7440-48-4	Cobalt	4950			P	114	229	1140
7440-50-8	Copper	27500			P	366	733	1140
7439-89-6	Iron	17400000			P	1370	2750	11400
7439-92-1	Lead	6700			P	779	1560	1830
7439-95-4	Magnesium	10900000			P	6640	13300	22900
7439-96-5	Manganese	187000			P	366	733	1140
7439-97-6	Mercury	39	U		CV	8.38	16.8	45.3
7440-02-0	Nickel	5940			P	366	733	1140
7440-09-7	Potassium	3910000			P	11400	22900	114000
7440-22-4	Silver	733	U	UJ	P	366	733	1140
7440-23-5	Sodium	44900000		J	P	22900	45800	68700
7440-28-0	Thallium	1560	U	UJ	P	779	1560	2290
7440-62-2	Vanadium	40800		J	P	366	733	1140
7440-66-6	Zinc	39600		J	P	756	1510	2290

JAC 41511

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

077

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD002-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 31.1 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	12600000		J %b	P	3660	7320	19200
7440-36-0	Antimony	924	U	UJ	P	462	924	1920
7440-39-3	Barium	10700		J	P	308	616	963
7440-41-7	Beryllium	337	J	J	P	308	616	963
7440-43-9	Cadmium	192	U	UJ	P	96.3	192	963
7440-70-2	Calcium	48000000		J	P	6350	12700	19200
7440-48-4	Cobalt	5820			P	96.3	192	963
7440-50-8	Copper	37400			P	308	616	963
7439-89-6	Iron	21400000			P	1160	2310	9630
7439-92-1	Lead	25800			P	655	1310	1540
7439-95-4	Magnesium	9290000			P	5580	11200	19200
7439-96-5	Manganese	219000			P	308	616	963
7439-97-6	Mercury	104			CV	5.95	11.9	32.2
7440-02-0	Nickel	6920			P	308	616	963
7440-09-7	Potassium	3320000			P	9630	19200	96300
7440-22-4	Silver	616	U	UJ	P	308	616	963
7440-23-5	Sodium	32900000		J	P	19200	38500	57800
7440-28-0	Thallium	1320	J		P	655	1310	1920
7440-62-2	Vanadium	43000			P	308	616	963
7440-66-6	Zinc	64700			P	635	1270	1920

JDC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

076

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020811

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200408

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	18.6	U		P	9.3	18.6	100
7440-39-3	Barium	0.44	U		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	78	U		P	39	78	100
7439-89-6	Iron	11	U		P	5.5	11	40
7439-95-4	Magnesium	11.5	J		P	9.8	19.6	100
7439-96-5	Manganese	0.7	U		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.86	U		P	0.93	1.86	4.1
7440-09-7	Potassium	143	U		P	71.7	143	500
7782-49-2	Selenium	8.2	U		P	4.1	8.2	9
7440-23-5	Sodium	239	J		P	180	300	300
7440-28-0	Thallium	8.8	U		P	4.4	8.8	10
7440-62-2	Vanadium	0.88	U		P	0.44	0.88	9
7440-66-6	Zinc	8	U		P	4	8	20

jac 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1923

075

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200401

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	186	U		P	93	186	1000
7440-39-3	Barium	7.41	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	~~415000~~		R SD	P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	~~1270000~~		R SD	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	~~U~~	UJ DT	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	~~419000~~		R SD	P	717	1430	5000
7782-49-2	Selenium	65.9	J		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

150311 1924

080

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023P-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200401DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10500000			P	9000	15000	15000

JMC 4/5/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

180311 1924

081

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200402

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~121~~ 186	✓	IA WBL	P	93	186	1000
7440-39-3	Barium	10.6	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	~~438000~~		R ~~E~~SD	P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	~~1350000~~		R ~~E~~SD	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	~~U~~	WJ DT	CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	~~443000~~		R ~~E~~SD	P	717	1430	5000
7782-49-2	Selenium	121			P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	5.78	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 41511

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

U82

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200402DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11400000			P	9000	15000	15000

JLC 41511

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

085

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW022-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200403

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~138~~ 186	J	U MAL	P	93	186	1000
7440-39-3	Barium	9.8	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	~~422000~~		R SD	P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	~~1310000~~		R SD	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.0454	J		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	~~431000~~		R SD	P	717	1430	5000
7782-49-2	Selenium	96.8			P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	5.82	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JBC 4/5/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

180311 1924

U064

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW022-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200403DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10900000			P	9000	15000	15000

JAC 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

086

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW021-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200404

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	186	U		P	93	186	1000
7440-39-3	Barium	7.76	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	~~434000~~		R SD	P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	~~1350000~~		R SD	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	~~448000~~		R SD	P	717	1430	5000
7782-49-2	Selenium	104			P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	4.5	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JAC 41511

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

160311 1924

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW021-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200404DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11100000			P	9000	15000	15000

JC 4571

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

087

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200405

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	~~153~~ 186	J	U MDL	P	93	186	1000
7440-39-3	Barium	8.65	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	~~414000~~		R SD	P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	~~1310000~~		R SD	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	~~428000~~		R SD	P	717	1430	5000
7782-49-2	Selenium	68.8	J		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JMC 4/5/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

088

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW018-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200405DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10900000			P	9000	15000	15000

JAC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

085

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW019-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200406

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	186	U		P	93	186	1000
7440-39-3	Barium	10.2	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	~~434000~~		R SD	P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	~~1340000~~		R SD	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	~~447000~~		R SD	P	717	1430	5000
7782-49-2	Selenium	105			P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	8.8	U		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

U96

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW019-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200406DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	10900000			P	9000	15000	15000

4/5/11

Color Before: Clarity Before: Texture :

Color After : Clarity After: Artifacts:

Comments:

180311 1924

091

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW020-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200407

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	186	U		P	93	186	1000
7440-39-3	Barium	9.74	J		P	2.2	4.4	100
7440-41-7	Beryllium	2.4	U		P	1.2	2.4	36.5
7440-70-2	Calcium	~~430000~~		R SD	P	390	780	1000
7439-89-6	Iron	110	U		P	55	110	400
7439-95-4	Magnesium	~~1360000~~		R SD	P	98	196	1000
7439-96-5	Manganese	7	U		P	3.5	7	100
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	18.6	U		P	9.3	18.6	41
7440-09-7	Potassium	~~443000~~		R SD	P	717	1430	5000
7782-49-2	Selenium	72.8	J		P	41	82	90
7440-28-0	Thallium	88	U		P	44	88	100
7440-62-2	Vanadium	4.94	J		P	4.4	8.8	90
7440-66-6	Zinc	80	U		P	40	80	200

JMC 4/15/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

160311 1924

092

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW020-0211DL1

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200407DL1

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-23-5	Sodium	11300000			P	9000	15000	15000

JAC 41511

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020811

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200408

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	18.6	U		P	9.3	18.6	100
7440-39-3	Barium	0.44	U		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	78	U		P	39	78	100
7439-89-6	Iron	11	U		P	5.5	11	40
7439-95-4	Magnesium	19.6	U		P	9.8	19.6	100
7439-96-5	Manganese	0.7	U		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.86	U		P	0.93	1.86	4.1
7440-09-7	Potassium	143	U		P	71.7	143	500
7782-49-2	Selenium	8.2	U		P	4.1	8.2	9
7440-23-5	Sodium	300	U		P	180	300	300
7440-28-0	Thallium	8.8	U		P	4.4	8.8	10
7440-62-2	Vanadium	0.88	U		P	0.44	0.88	9
7440-66-6	Zinc	8	U		P	4	8	20

JC 4/15/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

_____

_____

_____

180311 1924

054

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-EB01-020811

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): WATER Lab Sample ID: K0215-08

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.55	~~B~~	J	MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.5	U		MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	1	U		MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.2	U		MS	0.024	0.20	1.0
7440-50-8	Copper	0.5	U		MS	0.23	0.50	5.0
7439-92-1	Lead	0.2	U		MS	0.068	0.20	1.0
7440-22-4	Silver	0.05	U		MS	0.022	0.050	1.0

4/5/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD001-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): SOIL Lab Sample ID: K0215-13

Level (low/med): MED Date Received: 02/09/2011

% Solids: 23.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	4.0		J %Sol	MS	1.1	1.5	1.5
7440-47-3	Chromium	13.6		J ↓	MS	0.42	1.5	3.0
7782-49-2	Selenium	1.5 ~~1.2~~	~~B~~	UJ MBL	MS	0.45	1.5	7.5

JC 41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD002-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): SOIL Lab Sample ID: K0215-14

Level (low/med): MED Date Received: 02/09/2011

% Solids: 31.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	5.8		J %Sol	MS	1.1	1.5	1.5
7440-47-3	Chromium	13.8		J ↓	MS	0.41	1.5	2.9
7782-49-2	Selenium	1.5 ~~1.4~~	~~B~~	UJ MBL	MS	0.44	1.5	7.3

JLC 41511

Comments:

ISM_002 FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD014-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): SOIL Lab Sample ID: K0215-09

Level (low/med): MED Date Received: 02/09/2011

% Solids: 18.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	2.5	B	UJ %Sl	MS	1.9	2.5	2.5
7440-47-3	Chromium	10.9		J	MS	0.70	2.5	5.0
7782-49-2	Selenium	2.5 ~~1.3~~	~~B~~	UJ MBL	MS	0.75	2.5	13.0

41571

Comments:

ISM_002

FORM I - IN

SW846

096

0013

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD015-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): SOIL Lab Sample ID: K0215-10

Level (low/med): MED Date Received: 02/09/2011

% Solids: 28.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	2.0		J %Sol	MS	0.80	1.1	1.1
7440-47-3	Chromium	20.0		J ↓	MS	0.30	1.1	2.2
7782-49-2	Selenium	1.1 ~~0.84~~	~~B~~	UJ MBL	MS	0.32	1.1	5.4

JLC 41511

Comments:

ISM_002 FORM I - IN SW846 095

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SD016-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): SOIL Lab Sample ID: K0215-11

Level (low/med): MED Date Received: 02/09/2011

% Solids: 20.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	1.4		UJ %SD1	MS	1.0	1.4	1.4
7440-47-3	Chromium	10.3		J ↓	MS	0.39	1.4	2.8
7782-49-2	Selenium	1.4 ~~0.88~~		UJ MBL	MS	0.42	1.4	6.9

4/15/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD017-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): SOIL Lab Sample ID: K0215-12

Level (low/med): MED Date Received: 02/09/2011

% Solids: 16.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	2.1		J 2501	MS	1.5	2.1	2.1
7440-47-3	Chromium	6.7		J ↓	MS	0.58	2.1	4.2
7782-49-2	Selenium	2.1 ~~1.1~~	~~B~~	UJ MBL	MS	0.63	2.1	10.0

41571

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW018-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): WATER Lab Sample ID: K0215-05

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50 ~~33.2~~	~~B~~	U MDL	MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	50	U		MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW019-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): WATER Lab Sample ID: K0215-06

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50	U		MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	50	U		MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JLC 4/15/11

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW020-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): WATER Lab Sample ID: K0215-07

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50	U		MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	25.4	~~B~~ J		MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

41571

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW021-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): WATER Lab Sample ID: K0215-04

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U		MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500	U		MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW022-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): WATER Lab Sample ID: K0215-03

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U		MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500	U		MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

41511

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW023-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): WATER Lab Sample ID: K0215-02

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50 ~~20.1~~	~~B~~	U MBL	MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	24.4	~~B~~	J	MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JMC 41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW023P-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Matrix (soil/water): WATER Lab Sample ID: K0215-01

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50 ~~36.1~~	~~B~~	4 MDL	MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	50	U		MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JMC 21571

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-EB01-020811

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Matrix (soil/water): WATER Lab Sample ID: K0215-08

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.56	~~B~~	J	MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.5	U		MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	1	U		MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.2	U		MS	0.024	0.20	1.0
7440-50-8	Copper	0.5	U		MS	0.23	0.50	5.0
7439-92-1	Lead	0.2	U		MS	0.068	0.20	1.0
7440-22-4	Silver	0.05	U		MS	0.022	0.050	1.0

gbc 4/15/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW018-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Matrix (soil/water): WATER Lab Sample ID: K0215-05

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50 ~~34.3~~	~~B~~ U MBL		MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	50	U		MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

4/15/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW019-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Matrix (soil/water): WATER Lab Sample ID: K0215-06

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50	U		MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	50	U		MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JAC 4/15/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW020-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Matrix (soil/water): WATER Lab Sample ID: K0215-07

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50 ~~27.2~~	~~B~~ U MBL		MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	50	U		MS	23.0	50.0	500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JMC 4/15/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW021-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Matrix (soil/water): WATER Lab Sample ID: K0215-04

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U		MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500	U		MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

41571

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SW022-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Matrix (soil/water): WATER Lab Sample ID: K0215-03

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U		MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500	U		MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JAC 4/15/11

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW023-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Matrix (soil/water): WATER Lab Sample ID: K0215-02

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	250	U		MS	95.0	250	1000
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	500	U		MS	80.0	500	1000
7440-48-4	Cobalt	100	U		MS	12.0	100	500
7440-50-8	Copper	250	U		MS	120	250	2500
7439-92-1	Lead	20	U		MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

QAC 41511

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SW023P-0211

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Matrix (soil/water): WATER Lab Sample ID: K0215-01

Level (low/med): MED Date Received: 02/09/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	20	U		MS	20.0	20.0	200
7440-38-2	Arsenic	50 ~~33.5~~	~~B~~	U MBL	MS	19.0	50.0	200
7440-43-9	Cadmium	20	U		MS	8.4	20.0	100
7440-47-3	Chromium	100	U		MS	16.0	100	200
7440-48-4	Cobalt	20	U		MS	2.4	20.0	100
7440-50-8	Copper	26.0	~~B~~	J	MS	23.0	50.0	500
7439-92-1	Lead	11.9	~~B~~	J	MS	6.8	20.0	100
7440-22-4	Silver	5	U		MS	2.2	5.0	100

JAC 41511

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200401

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.047			SP	0.0035	0.007	0.01

J, HT

WW 041111

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200402

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.029			SP	0.0035	0.007	0.01

J, HT

VWL 041111

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 033

116

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW022-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200403

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.012			SP	0.0035	0.007	0.01

J, HT

WW 04/11/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

115

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW021-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200404

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.008	J		SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

126

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200405

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.021			SP	0.0035	0.007	0.01

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

121

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW019-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200406

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.018			SP	0.0035	0.007	0.01

J, HT

VW 2/11/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

040411 933

122

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW020-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200407

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.029			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020811

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200408

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

UJ, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

124

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD014-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200412

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 18 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	24800			SP	1290	2580	5170

J, %SOL

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

125

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD015-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200413

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 28.4 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	150000			SP	853	1700	3410

J, %.SOL

VW 04/11/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

126

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD016-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200414

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 19.7 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	30500			SP	1210	2430	4860

J, 'L SOL

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD017-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200415

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 16.2 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	101000			SP	1460	2920	5840

J, % Sol

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

126

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD001-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200416

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 22.9 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
~~7664-41-7~~	~~Ammonia~~	~~351000~~			~~AS~~	~~775~~	~~1.55~~	~~3880~~
18540-29-9	Hexavalent Chromium	38600			SP	1060	2120	4250

LW 04/11/11

J, % SOL

LW 04/11/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

125

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD002-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

Matrix: SOIL Lab Sample ID: 350200417

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 31.1 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
~~7664-41-7~~	~~Ammonia~~	~~167000~~			~~AS~~	~~592~~	~~1.184~~	~~2960~~
18540-29-9	Hexavalent Chromium	36900			SP	758	1520	3030

UM 04111

J, % SOL

UM 04111

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 933

136

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200401

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MGIL

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.016			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

131

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200402

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.016			SP	0.0035	0.007	0.01

J, HT

WW 2/14/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW022-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200403

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.004	J		SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

135

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW021-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200404

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

UJ, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

134

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200405

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.015			SP	0.0035	0.007	0.01

J, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW019-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200406

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	J		SP	0.0035	0.007	0.01

J, HT

WW 04/11/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

136

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW020-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200407

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.016			SP	0.0035	0.007	0.01

J, HT

04/11/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

190311 1924

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-020811

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: WATER Lab Sample ID: 350200408

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.007	U		SP	0.0035	0.007	0.01

UJ, HT

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1924

136

MITKEM LABORATORIES

A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3502004 RTS

Page 1 of 2

Special Handling:
TAT- Indicate Date Needed: _____
- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 30 days unless otherwise instructed.

Report To: Michael Zamboni / WDC
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
703-376-5111 michael.zamboni@ch2m.com
Project Mgr.: Bill Hannah / VBO

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 402244.FI.SW.06 CTO 111
Site Name: SWMU6
Location: Vieques State: PR
Sampler(s): D. Ballam J. Martin

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8=$NaHSO_4$ 9=_____ 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

QA/QC Reporting Level
☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____

State specific reporting standards: _____

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: Pest/PCBs	Metal Hex Cr (preserve HNO3)	Metals (preserve HNO3)	Filtered Hex Cr (preserve HNO3)	Filtered Metal (preserve HNO3)	Notes:
-01	VWW06-SW023P-0211	2/8/11	0735				2		6	✓	✓	✓	✓	✓	
-02	VWW-06-SW023-0211	2/8/11	0735				2		6	✓	✓	✓	✓	✓	
-03	VWW-06-SW022-0211	2/8/11	0810				2		6	✓	✓	✓	✓	✓	
-04	VWW06-SW021-0211	2/8/11	0835				2		6	✓	✓	✓	✓	✓	
-05	VWW06-SW018-0211	MD 2/8/11	1010				2		6	✓	✓	✓	✓	✓	
-06	VWW06-SW019-0211	2/8/11	0945				2		6	✓	✓	✓	✓	✓	
-07	VWW06-SW020-0211	2/8/11	0930				2		6	✓	✓	✓	✓	✓	
-08	VWAE-EB01-020811	2/8/11	0600				2		6	✓	✓	✓	✓	✓	VWW06-EB01-020811 (per client)
-09	VWAE-EB02-020811	2/8/11	0620				2			✓					VWW06-EB02-020811

☐ E-mail to pH ≤ 2 8260/6010/6020, Samples -03, -04 arrived 2-10-11, No double Ambers received
EDD Format pdw vials received
Asm=Faultner OL, ORP=Aquamonk, 9031, TOC, AVS=mitkem

Condition upon receipt: ☒ Iced ☐ Ambient ☒ °C 1.4, 2.2, 1.6, 3.1, 3.3

Relinquished by:	Received by:	Date:	Time:
	Russell Stanton	2-9-11	900

3502004

1071

MITKEM LABORATORIES

A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3502004 RJS

Page 2 of 2

Special Handling:
TAT- Indicate Date Needed: _____
· All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
· Samples disposed of after 30 days unless otherwise instructed.

Report To: _____

Invoice To: _____

Project No.: _____
Site Name: _____
Location: _____ State: _____
Sampler(s): _____

Project Mgr.: _____

P.O. No.: _____ RQN: _____

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9=_____ 10=_____ 11= _____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	VOCs	Analyses: ARCELORS	Metals	Pest/PCBs	W CHEM	PAHs	CrCHEM (sulfide)	Cr(VI)	AVS/SEM	Notes:
-10, -20, -21	VWW06-SS012-0211	2/7/11	1610				3				✓								Run MS/MSD
-11	VWW06-SS013-0211	2/7/11	1615				1				✓								
-12	VWW06-SD014-0211	2/7/11	1545				1	3				✓	✓	✓					
-13	VWW06-SD015-0211	2/7/11	1520				1	3				✓	✓	✓					
-14	VWW06-SD016-0211	2/7/11	1505				1	3				✓	✓	✓					
-15	VWW06-SD017-0211	2/7/11	1425				1	3				✓	✓	✓					
-16	VWW06-SD01-0211	2/8/11	1125			3	3	5		✓		✓	✓	✓	✓	✓	✓	✓	VWW06-SD001-0211
-17	VWW06-SD02-0211	2/8/11	1110			3	3	5		✓		✓	✓	✓	✓	✓	✓	✓	VWW06-SD002-0211
-18	VWAE-TB01-020811	2/8/11	1200			3				✓									VWW06-TB01-020811
-19	VWW06-SD0137-0211	2/7/11	1615				1				✓								

per Client Mail

☐ E-mail to _____
EDD Format _____

Relinquished by:

Received by: Russell Gladden

Date: 2-9-11 Time: 9:00

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

QA/QC Reporting Level
☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____
State specific reporting standards: _____

3502004

146

1072

International Air Waybill

FedEx Tracking Number 8747 2112 6530 Form ID No. 0402

'08/11 Sender's FedEx Account Number 186718208

ria Davois Phone

HDNHILL

mp Garcia

tg 4525

ues State Province PR.

A ZIP Postal Code 007165

ohn Heyman Phone 813-888-9507

L LABS Sample Receiving

405 Benjamin RD Dept/Floor

ite A

mpa State Province FL

A ZIP Postal Code 33634

) Number for Customs Purposes
WABN, or as locally required.

4 Express Package Service

Packages up to 150 lbs. / 68 kg. For packages over 150 lbs. / 68 kg, use the FedEx Expanded Service Intl. Air Waybill.

1 [X] FedEx Intl. Priority 6 [ ] FedEx Intl. First (Available to select locations)

[ ] 2 [ ] 3 FedEx Intl. Economy (FedEx Envelope and FedEx Pak rate not available.)

Not all services and options are available to all destinations. Dangerous goods cannot be shipped using this Air Waybill.

5 Packaging

*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 [ ] FedEx Envelope 2 [ ] FedEx Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube

1 [X] Other PW [ ] FedEx 10kg Box* PX [ ] FedEx 25kg Box*

6 Special Handling

1 [ ] HOLD at FedEx Location 3 [ ] SATURDAY Delivery (Available to select locations for FedEx Intl. Priority only.)

7 Payment

Complete payment options for both transportation charges and duties and taxes.

Bill transportation charges to:

Enter FedEx Acct. No. or Credit Card No. below.

1 [X] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 4 [ ] Credit Card 5 [ ] Cash Check/Cheque

FedEx Acct. No. [redacted]

Credit Card Exp. Date Total Transportation Specify Currency

Bill duties and taxes to:

ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 [X] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 5 [ ] Cash Check/Cheque

FedEx Acct. No. 186718208

8 Your Internal Billing Reference

First 24 characters will appear on invoice.

404422.F1.SW.06

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature: Nina Davois

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Carriage as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

rmation [ ] For EU Only: Tick here if goods are not in free circulation and provide C.I.

1 Total Weight 50 lbs. [X] kg [ ] DIM L / W / H in. [ ] cm [ ]

Commodity Description	Harmonized Code	Country of Manufacture	Value for Customs
mples		USA	

[ ] No EEI required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

emption number: If other than NLR, enter License Exception:

Total Declared Value for Carriage

Total Value for Customs (Specify Currency)

filing citation:

FedEx Tracking Number 8747 2112 6530 0402 Form ID No.

Origin Station ID	Country Code/Destination Station ID	URSA Routing	Handling Units
FLL	PR	XJ QF	Total Volume (cm)

Received At: 1 [ ] Reg. Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] World Service Center 5 [ ] Station

Forms Attached: [ ] CI [ ] CD

Base Charges FedEx Emp. # Declared Val. Chrg. Other ODA/ OPA Credit Card Auth.

Audit Emp. # Date Time Del. Courier Emp. # Date

568

PART 158410
Rev. Date 11/08
©1994–2008 FedEx
PRINTED IN U.S.A. RRDA

MKDA 10/10

X® International Air Waybill
press

FedEx Tracking Number 8747 2112 6520 Form ID No. 0402

08/11 Sender's FedEx Account Number 186718208

Yana Davis Phone

CH2MHILL

Camp Garcia

Bldg 4525

Guss State Province PR

PA ZIP Postal Code 00765

John Heyman Phone 813-858-9507

EL LABS Sample Receiving

8405 Benjamin RD Dept/Floor

Suite A

Tampa State Province FL

SA ZIP Postal Code 33634

ID Number for Customs Purposes
EIN/ABN, or as locally required.

4 Express Package Service

Packages up to 150 lbs. / 68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Int. Air Waybill.

1 [X] FedEx Intl. Priority 6 [X] FedEx Intl. First Available to select locations.

[ ] 2 [ ] 3 [ ] FedEx Intl. Economy FedEx Envelope and FedEx Pak rate not available.

Not all services and options are available to all destinations. Dangerous goods cannot be shipped using this Air Waybill.

5 Packaging

*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 [ ] FedEx Envelope 2 [ ] FedEx Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube

1 [X] Other PW [ ] FedEx 10kg Box* PX [ ] FedEx 25kg Box*

6 Special Handling

1 [ ] HOLD at FedEx Location 3 [ ] SATURDAY Delivery Available to select locations for FedEx Intl. Priority only.

7 Payment Complete payment options for both transportation charges and duties and taxes.

Bill transportation charges to: Enter FedEx Acct. No. or Credit Card No. below.

1 [X] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 4 [ ] Credit Card 5 [ ] Cash Check/Cheque Total Transportation

FedEx Acct. No. [redacted]

Credit Card Exp. Date Specify Currency

Bill duties and taxes to: Enter FedEx Acct. No. below. ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

1 [X] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 5 [ ] Cash Check/Cheque

FedEx Acct. No. 186718208

8 Your Internal Billing Reference First 24 characters will appear on invoice.

404422.FI.SW.06

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature: Yana Davis

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Carriage as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

FedEx Tracking Number 8747 2112 6520 0402

Form ID No. 0402

PART 158410 Rev. Date 11/08 ©1994–2008 FedEx PRINTED IN U.S.A. RRDA

568

formation [ ] For EU Only: Tick here if goods are not in free circulation and provide C.I.

1 Total Weight 10 [X] lbs. [ ] kg DIM L / W / H [ ] in. [ ] cm

Commodity Description	Harmonized Code	Country of Manufacture	Value for Customs
Samples		USA	10

[ ] No EEI required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

Exemption number: If other than NLR, enter License Exception:

Filing citation:

Total Declared Value for Carriage 10

Total Value for Customs (Specify Currency) USD 10

Origin Station ID	Country Code/Destination Station ID	URSA Routing	Handling Units
FWLX	TF	WJ TF	Total Volume (cm)

Received At: 1 [ ] Reg. Stop 2 [X] On-Call Stop 3 [ ] Drop Box 4 [ ] World Service Center 5 [ ] Station

Forms Attached: [ ] CI [ ] CO

Base Charges 10.50 Declared Val. Chrg. Other COD/DPA Credit Card Auth.

FedEx Emp. # Audit Emp. # Date Time Del. Courier Emp. # Date Time

144

International Air Waybill

FedEx Tracking Number 8716 9323 2672 Form ID No. 0402

Origin Copy

2/08/11 Sender's FedEx Account Number 186718 208

Yara Davara Phone

CH2MHill

Camp Garcia

Bldg 4525

eques State Province PR

SA ZIP Postal Code 00765

John Heyman Phone 818-888-9507

EL LABS Sample Receiving

405 Benjamin RD Dept/Floor

uite A

mpa State Province FL

SA ZIP Postal Code 33634

ID Number for Customs Purposes
(EIN/ABN, or as locally required.

4 Express Package Service — *Packages up to 150 lbs. / 68 kg* — For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 [X] FedEx Intl. Priority
6 [ ] FedEx Intl. First — Available to select locations. Higher rates apply.
3 [ ] FedEx Intl. Economy — FedEx Envelope and FedEx Pak rate not available.

Not all services and options are available to all destinations. Dangerous goods cannot be shipped using this Air Waybill.

5 Packaging — *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only

6 [ ] FedEx Envelope 2 [ ] FedEx Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube
1 [X] Other PW [ ] FedEx 10kg Box* PX [ ] FedEx 25kg Box*

6 Special Handling
1 [ ] HOLD at FedEx Location 3 [ ] SATURDAY Delivery — Available to select locations for FedEx Intl. Priority only.

7a Payment *Bill transportation charges to:* — Enter FedEx Acct. No. or Credit Card No. below.
1 [X] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 4 [ ] Credit Card 5 [ ] Cash Check/Cheque
FedEx Acct. No. [redacted] Total Transportation
Credit Card Exp. Date Specify Currency

7b Payment *Bill duties and taxes to:* — ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.
1 [X] Sender Acct. No. in Section 1 will be billed. Enter FedEx Acct. No. below. 2 [ ] Recipient 3 [ ] Third Party 5 [ ] Cash Check/Cheque
FedEx Acct. No. 186718 208

8 Your Internal Billing Reference — First 24 characters will appear on invoice.
404422.F1.SW.06

9 Required Signature
Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.
Sender's Signature: Yara Davara
This is not authorization to deliver this shipment without a recipient signature.
Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Contract as stated on the reverse side of the Recipient's Copy.
Recipient's Signature:

formation [ ] For EU Only: Tick here if goods are not in free circulation and provide C.I.

s 1 Total Weight 50 [X] lbs. [ ] kg DIM / / [ ] in. [ ] cm

Commodity Description DETAIL REQUIRED	Harmonized Code	Country of Manufacture	Value for Customs REQUIRED
samples		VA	NCV

AES [ ] No EEI/SED required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR. Total Declared Value for Carriage 150 Total Value for Customs (Specify Currency) NCV

or exemption number If other than NLR, enter License Exception:

Bling citation:

521
PART 158410 Rev. Date 4/08 ©1994-2008 FedEx PRINTED IN U.S.A.

FedEx Tracking Number 8716 9323 2672 0402 Form ID No.

Origin Station ID	Destination Station ID	URSA Routing	Handling Units
FATA	TOF	XNTA	Total Volume (cm³)

Received At 1 [ ] Reg. Stop 2 [X] On-Call Stop 3 [ ] Drop Box 4 [ ] World Service Center 5 [ ] Station Forms Attached: [ ] CI [ ] CO

Base Charges Declared Val. Chrg. Other ODA/ DPA Credit Card Auth.
FedEx Emp. # Audit Emp. # Date Time Del. Courier Emp. # Date Time

3502004

140

1075

FedEx International Air Waybill

FedEx Tracking Number 8747 2112 6585 Form ID No. 0402

02/08/11 Sender's FedEx Account Number 186718208

Jake Crostic Phone

CH2M Hill

Camp Garcia

Bldg 4525

[illegible] State Province PR

USA ZIP Postal Code 00765

John Heyrman Phone 813-888-9507

TEL LABS - Sample Receiving

8405 Benjamin RD Dept./Floor

Suite A

Tampa State Province FL

USA ZIP Postal Code 33634

x ID Number for Customs Purposes
VEIN/ABN, or as locally required.

4 Express Package Service

Packages up to 150 lbs. / 68 kg
For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 [X] FedEx Intl. Priority 6 [X] FedEx Intl. First Available to select locations.

[ ] 2 3 [ ] FedEx Intl. Economy FedEx Envelope and FedEx Pak rate not available.

Not all services and options are available to all destinations. Dangerous goods cannot be shipped using this Air Waybill.

5 Packaging

*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 [ ] FedEx Envelope 2 [ ] FedEx Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube

1 [X] Other PW [ ] FedEx 10kg Box* PX [ ] FedEx 25kg Box*

6 Special Handling

1 [ ] HOLD at FedEx Location 3 [ ] SATURDAY Delivery Available to select locations for FedEx Intl. Priority only.

7 Payment

Complete payment options for both transportation charges and duties and taxes.

Bill transportation charges to:

Enter FedEx Acct. No. or Credit Card No. below.

1 [ ] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 4 [ ] Credit Card 5 [ ] Cash Check/Cheque

FedEx Acct. No. [redacted]

Credit Card Exp. Date Total Transportation

Specify Currency

Bill duties and taxes to:

All shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 [X] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 5 [ ] Cash Check/Cheque

FedEx Acct. No. 186718208

8 Your Internal Billing Reference

First 24 characters will appear on invoice.

404422.F1.SW.06

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities,technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature: [signature] *This is not authorization to deliver this shipment without a recipient signature.*

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Carriage as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

nformation

[ ] For EU Only: Tick here if goods are not in free circulation and provide C.I.

1 Total Weight 50 lbs. [X] kg [ ] DIM L / W / H in. [ ] cm [ ]

Commodity Description	Harmonized Code	Country of Manufacture	Value for Customs
Samples		US	10

[ ] No EEI required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

xemption number: If other than NLR, enter License Exception:

filing citation:

Total Declared Value for Carriage: 10

Total Value for Customs (Specify Currency): USD

FedEx Tracking Number 8747 2112 6585 0402

Form ID No.

Origin Station ID	Country Code/Destination Station ID	URSA Routing	Handling Units
FCA	PR		Total Volume (cm)

Received At: 1 [ ] Reg. Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] World Service Center 5 [ ] Station

Forms Attached: [ ] CI [ ] CO

Basis Charges FedEx Emp. #: USTC

Declared Val. Charg. Other ODA/ OPA Credit Card Auth.

Audit Emp. # Date Time Del. Courier Emp. # Date Time

568

PART 158610
Rev. Date 11/08
©1994-2008 FedEx
PRINTED IN U.S.A. RSOA

144

FedEx Express International Air Waybill

FedEx Tracking Number 8747 2112 6519 Form ID No. 0402

From

Date 02/08/11 Sender's FedEx Account Number 186718208

Sender's Name Jake Crostic Phone

Company CH2M HILL

Address Camp Garcia

Address Bldg 4525

City Vieques State/Province PR

Country USA ZIP/Postal Code 00765

To

Recipient's Name John Heyman Phone 813-888-9507

Company PEL LABS Sample Receiving

Address 8405 Benjamin RD Dept/Floor

Address Suite A

City Tampa State/Province FL

Country USA ZIP/Postal Code 33634

Recipient's Tax ID Number for Customs Purposes (e.g. GST/RFC/VAT/IVA/EIN/ABN, or as locally required.)

Shipment Information For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 lbs. kg DIM L / W / H in. cm

Commodity Description	Harmonized Code	Country of Manufacture	Value for Customs
60 Samples		VSA	XX

Been filed in AES? (Export Only: Check One) No EEI required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR

EEI required, enter exemption number: If other than NLR, enter License Exception:

– Enter AES proof of filing citation:

Total Declared Value for Carriage VD

Total Value for Customs (Specify Currency) USD

4 Express Package Service

Packages up to 150 lbs. / 68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 [X] FedEx Intl. Priority 6 [ ] FedEx Intl. First (Available to select locations.)

[ ] 3 [ ] FedEx Intl. Economy (FedEx Envelope and FedEx Pak rate not available)

Not all services and options are available to all destinations. Dangerous goods cannot be shipped using this Air Waybill.

5 Packaging *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 [ ] FedEx Envelope 2 [ ] FedEx Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube

1 [X] Other PW [ ] FedEx 10kg Box* PX [ ] FedEx 25kg Box*

6 Special Handling

1 [ ] HOLD at FedEx Location 3 [ ] SATURDAY Delivery (Available to select locations for FedEx Intl. Priority only.)

7 Payment Complete payment options for both transportation charges and duties and taxes.

Bill transportation charges to: (Enter FedEx Acct. No. or Credit Card No. below.)

1 [X] Sender (Acct. No. in Section 1 will be billed.) 2 [ ] Recipient 3 [ ] Third Party 4 [ ] Credit Card 5 [ ] Cash/Check/Cheque

Total Transportation

FedEx Acct. No. [redacted]

Credit Card Exp. Date Specify Currency

Bill duties and taxes to: (Enter FedEx Acct. No. below.) ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

1 [X] Sender (Acct. No. in Section 1 will be billed.) 2 [ ] Recipient 3 [ ] Third Party 5 [ ] Cash/Check/Cheque

FedEx Acct. No. 186718208

8 Your Internal Billing Reference First 24 characters will appear on invoice.

404452.FI.SW.06

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature: [signature] *This is not authorization to deliver this shipment without a recipient signature.*

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Carriage as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

568

PART 158410 Rev. Date 11/08 ©1994–2008 FedEx PRINTED IN U.S.A. RRDA

FedEx Tracking Number 8747 2112 6519 0402 Form ID No.

Origin Station ID	Country Code/Destination Station ID	URSA Routing	Handling Units
PNS	TPF	XX TPF	Total Volume (cm)

Received At: 1 [ ] Reg. Stop 2 [X] On-Call Stop 3 [ ] Drop Box 4 [ ] World Service Center 5 [ ] Station Forms Attached: [ ] CI [ ] CI

Base Charges 1970 Declared Val. Chrg. Other ODA/OPA Credit Card Auth.

FedEx Emp. # Audit Emp. # Date Time Del. Courier Emp. # Date Time

Visit us online at fedex.com

3502004

140

1077

PEL, a Division of Spectrum Analytical, Inc.

pH LOG SHEET

Work Order # 3502004 By KDS

Client / Project Name Vieques SMM06/402244.PE.SW.06 C001 Date 2-9-4

PEL Sample Number	H_2SO_4 (pH<2) 6010/6020/6010F/6020F		HNO_3 (pH<2)		NaOH (pH>12)		ZnAC/NaOH (pH>9)		HCl (pH<2) 8260		Other ____ pH ____	
	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH
01	4	<2							-			
02									-			
03									-			
04									-			
05									-			
06									-			
07									-			
08									-			
09									-			
10									-			
11									-			
12									-			
13									-			
14									-			
15									-			
16									-			
17									-			
18									3	<2		
19												
20												

3502004

W:\Login\Forms\pH LOG SHEET REV 4.doc

146

1078

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	3502004	**Req:**	90619
Client:	CH2M Hill	**Project:**	CTO-083 / CTO-111 SWMU 6
Level:	4	**Date Rec'd:**	2/9/2011 9:00:00 AM
Rec'd via:	Fed-Ex	**Due Date:**	2/24/2011

Sample Verification

Samples/Cooler Secure?	Yes	**All Samples on COC accounted For?**	Yes
Temperature of Samples(Celsius)	1.4C-3.1C	**All Samples Rec'd Intact?**	Yes
pH Verified?	Yes	**Sample Vol. Sufficient For Analysis**	Yes
pH WNL?	Yes	**Samples Rec'd W/I Hold Time?**	Yes
Soil Origin (Domestic/Foreign):	Foreign	**Are All Samples to be Analyzed?**	Yes
Site Location/Project on COC?	Yes	**Correct Sample Containers?**	Yes
Client Project # on COC?	Yes	**COC Comments written on COC?**	Yes
Project Mgr. Indicated on COC?	Yes	**Samplers Initials on COC?**	Yes
COC relinquished/Dated by Client?	Yes	**Sample Date/Time Indicated?**	Yes
COC Received/Dated by PEL?	Yes	**TAT Requested:**	STD
Specific Subcontract Indicated?	No	**Client Requests Verbal Results?**	No
Samples Received By	Fed-Ex	**Client Requests Faxed Results?**	No
PEL to Conduct ALL Analyses?	No	**Specific tests noted on COC**	
Radioactivity Check?	No		
COC Present?	Yes		

PEER REVIEW _____

Client: CH2M Hill

WONo: 3502004 Profile Name: Vieques Profile #: 90619

MATRIX S

Sample #	Bottle	Parameter		Check	Received	Date
10	001	8082	PCB	In	Russell Stallone	2/9/2011 5:12:54 PM
10	001	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:36 AM
10	001	8082	PCB	In	Frank Colosi	2/11/2011 7:14:20 PM
10	001	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:12:55 PM
10	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:16:50 AM
10	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:14 AM
11	001	8082	PCB	In	Russell Stallone	2/9/2011 5:12:58 PM
11	001	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:46 AM
11	001	8082	PCB	In	Frank Colosi	2/11/2011 7:14:22 PM
11	001	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:12:58 PM
11	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:16:55 AM
11	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:16 AM
12	002	6010	Metals	In	Russell Stallone	2/9/2011 5:13:22 PM
12	002	6010	Metals	Out	Gerson Galvis	2/10/2011 9:48:37 AM
12	002	6010	Metals	In	Gerson Galvis	2/10/2011 10:24:35 AM
12	002	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:23 PM
12	002	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/10/2011 7:33:10 AM
12	002	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/10/2011 9:49:11 AM
12	002	7471	Mercury	In	Russell Stallone	2/9/2011 5:13:24 PM
12	002	7471	Mercury	Out	Gerson Galvis	2/11/2011 8:53:22 AM
12	002	7471	Mercury	In	Gerson Galvis	2/11/2011 12:49:23 PM
12	002	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:35:52 AM
12	002	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:21 AM
12	004	8081	Pesticides	In	Russell Stallone	2/9/2011 5:13:51 PM
12	004	8081	Pesticides	Out	Frank Colosi	2/11/2011 9:02:21 AM
12	004	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:03 PM
12	004	8082	PCB	In	Russell Stallone	2/9/2011 5:13:56 PM
12	004	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:22 AM

12	004	8082	PCB	In	Frank Colosi	2/11/2011 7:14:06 PM
12	002	9045	Corosivity - pH	In	Nicole Labus	2/9/2011 4:00:00 PM
12	002	9045	Corosivity - pH	Out	Gerson Galvis	2/14/2011 6:30:07 AM
12	002	9045	Corosivity - pH	In	Gerson Galvis	2/14/2011 10:18:58 AM
12	002	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:26 PM
12	002	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:16:57 AM
12	002	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:17 AM
13	002	6010	Metals	In	Russell Stallone	2/9/2011 5:13:29 PM
13	002	6010	Metals	Out	Gerson Galvis	2/10/2011 9:48:31 AM
13	002	6010	Metals	In	Gerson Galvis	2/10/2011 10:24:37 AM
13	002	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:29 PM
13	002	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/10/2011 7:33:20 AM
13	002	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/10/2011 9:49:13 AM
13	002	7471	Mercury	In	Russell Stallone	2/9/2011 5:13:29 PM
13	002	7471	Mercury	Out	Gerson Galvis	2/11/2011 8:53:26 AM
13	002	7471	Mercury	In	Gerson Galvis	2/11/2011 12:49:24 PM
13	002	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:35:55 AM
13	002	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:23 AM
13	004	8081	Pesticides	In	Russell Stallone	2/9/2011 5:13:58 PM
13	004	8081	Pesticides	Out	Frank Colosi	2/11/2011 9:02:24 AM
13	004	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:10 PM
13	004	8082	PCB	In	Russell Stallone	2/9/2011 5:13:58 PM
13	004	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:24 AM
13	004	8082	PCB	In	Frank Colosi	2/11/2011 7:14:10 PM
13	002	9045	Corosivity - pH	In	Nicole Labus	2/9/2011 4:00:00 PM
13	002	9045	Corosivity - pH	Out	Gerson Galvis	2/14/2011 6:30:09 AM
13	002	9045	Corosivity - pH	In	Gerson Galvis	2/14/2011 10:19:00 AM
13	002	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:29 PM
13	002	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:16:59 AM
13	002	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:19 AM
14	001	6010	Metals	In	Russell Stallone	2/9/2011 5:13:30 PM
14	001	6010	Metals	Out	Gerson Galvis	2/10/2011 9:48:16 AM

14	001	6010	Metals	In	Gerson Galvis	2/10/2011 10:24:38 AM
14	001	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:30 PM
14	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/10/2011 7:33:59 AM
14	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/10/2011 9:49:16 AM
14	001	7471	Mercury	In	Russell Stallone	2/9/2011 5:13:30 PM
14	001	7471	Mercury	Out	Gerson Galvis	2/11/2011 8:53:31 AM
14	001	7471	Mercury	In	Gerson Galvis	2/11/2011 12:49:28 PM
14	001	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:35:58 AM
14	001	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:29 AM
14	004	8081	Pesticides	In	Russell Stallone	2/9/2011 5:13:59 PM
14	004	8081	Pesticides	Out	Frank Colosi	2/11/2011 9:02:26 AM
14	004	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:12 PM
14	004	8082	PCB	In	Russell Stallone	2/9/2011 5:13:59 PM
14	004	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:26 AM
14	004	8082	PCB	In	Frank Colosi	2/11/2011 7:14:12 PM
14	001	9045	Corosivity - pH	In	Nicole Labus	2/9/2011 4:00:00 PM
14	001	9045	Corosivity - pH	Out	Gerson Galvis	2/14/2011 6:30:10 AM
14	001	9045	Corosivity - pH	In	Gerson Galvis	2/14/2011 10:19:01 AM
14	001	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:30 PM
14	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:17:01 AM
14	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:21 AM
15	003	6010	Metals	In	Russell Stallone	2/9/2011 5:13:32 PM
15	003	6010	Metals	Out	Gerson Galvis	2/10/2011 9:48:21 AM
15	003	6010	Metals	In	Gerson Galvis	2/10/2011 10:24:39 AM
15	003	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:32 PM
15	003	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/10/2011 7:33:14 AM
15	003	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/10/2011 9:49:14 AM
15	003	7471	Mercury	In	Russell Stallone	2/9/2011 5:13:32 PM
15	003	7471	Mercury	Out	Gerson Galvis	2/11/2011 8:53:34 AM
15	003	7471	Mercury	In	Gerson Galvis	2/11/2011 12:49:30 PM
15	003	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:04 AM
15	003	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:30 AM

15	001	8081	Pesticides	In	Russell Stallone	2/9/2011 5:14:01 PM
15	001	8081	Pesticides	Out	Frank Colosi	2/11/2011 9:02:28 AM
15	001	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:14 PM
15	001	8082	PCB	In	Russell Stallone	2/9/2011 5:14:01 PM
15	001	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:28 AM
15	001	8082	PCB	In	Frank Colosi	2/11/2011 7:14:14 PM
15	003	9045	Corosivity - pH	In	Nicole Labus	2/9/2011 4:00:00 PM
15	003	9045	Corosivity - pH	Out	Gerson Galvis	2/14/2011 6:30:11 AM
15	003	9045	Corosivity - pH	In	Gerson Galvis	2/14/2011 10:19:03 AM
15	003	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:32 PM
15	003	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:17:09 AM
15	003	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:23 AM
16	008	6010	Metals	In	Russell Stallone	2/9/2011 5:13:33 PM
16	008	6010	Metals	Out	Gerson Galvis	2/10/2011 9:48:26 AM
16	008	6010	Metals	In	Gerson Galvis	2/10/2011 10:24:41 AM
16	008	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:33 PM
16	008	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/10/2011 7:33:04 AM
16	008	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/10/2011 9:49:09 AM
16	008	7471	Mercury	In	Russell Stallone	2/9/2011 5:13:33 PM
16	008	7471	Mercury	Out	Gerson Galvis	2/11/2011 8:53:38 AM
16	008	7471	Mercury	In	Gerson Galvis	2/11/2011 12:49:31 PM
16	008	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:08 AM
16	008	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:33 AM
16	003	8081	Pesticides	In	Russell Stallone	2/9/2011 5:14:03 PM
16	002	8081	Pesticides	Out	Frank Colosi	2/11/2011 9:02:30 AM
16	002	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:16 PM
16	003	8082	PCB	In	Russell Stallone	2/9/2011 5:14:03 PM
16	002	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:30 AM
16	002	8082	PCB	In	Frank Colosi	2/11/2011 7:14:16 PM
16	011	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:04:43 PM
16	007	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:04:45 PM

16	010	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:04:47 PM
16	007	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/15/2011 3:08:53 PM
16	010	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 3:34:55 PM
16	002	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/10/2011 1:38:35 PM
16	002	8270_SIM	GCMS semivolatile SIM	Out	Christelle Abadia	2/10/2011 1:39:03 PM
16	002	8270_SIM	GCMS semivolatile SIM	In	Christelle Abadia	2/10/2011 1:55:30 PM
16	008	9045	Corosivity - pH	In	Nicole Labus	2/9/2011 4:00:00 PM
16	008	9045	Corosivity - pH	Out	Gerson Galvis	2/14/2011 6:30:13 AM
16	008	9045	Corosivity - pH	In	Gerson Galvis	2/14/2011 10:19:05 AM
16	008	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:33 PM
16	008	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:17:11 AM
16	008	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:25 AM
16	008	SM4500-NH3-G	Ammonia	In	Russell Stallone	2/9/2011 5:13:00 PM
16	008	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:17:14 AM
16	008	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:31:36 AM
17	006	6010	Metals	In	Russell Stallone	2/9/2011 5:13:35 PM
17	006	6010	Metals	Out	Gerson Galvis	2/10/2011 9:48:10 AM
17	006	6010	Metals	In	Gerson Galvis	2/10/2011 10:24:43 AM
17	006	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:35 PM
17	006	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/10/2011 7:33:24 AM
17	006	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/10/2011 9:49:06 AM
17	006	7471	Mercury	In	Russell Stallone	2/9/2011 5:13:35 PM
17	006	7471	Mercury	Out	Gerson Galvis	2/11/2011 8:53:42 AM
17	006	7471	Mercury	In	Gerson Galvis	2/11/2011 12:49:32 PM
17	006	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:12 AM
17	006	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:35 AM
17	009	8081	Pesticides	In	Russell Stallone	2/9/2011 5:14:08 PM
17	010	8081	Pesticides	In	Russell Stallone	2/9/2011 5:14:26 PM
17	010	8081	Pesticides	Out	Frank Colosi	2/11/2011 9:02:33 AM
17	010	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:18 PM

17	010	8082	PCB	In	Russell Stallone	2/9/2011 5:14:27 PM
17	010	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:33 AM
17	010	8082	PCB	In	Frank Colosi	2/11/2011 7:14:18 PM
17	003	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:04:48 PM
17	004	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:04:50 PM
17	001	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:04:51 PM
17	004	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/15/2011 3:08:53 PM
17	003	8260	Volatile Organic Compounds	Consumed	Lisa Pelo	2/17/2011 3:34:56 PM
17	010	8270_SIM	GCMS semivolatile SIM	In	Russell Stallone	2/10/2011 1:38:36 PM
17	010	8270_SIM	GCMS semivolatile SIM	Out	Christelle Abadia	2/10/2011 1:39:00 PM
17	010	8270_SIM	GCMS semivolatile SIM	In	Christelle Abadia	2/10/2011 1:55:42 PM
17	006	9045	Corosivity - pH	In	Nicole Labus	2/9/2011 4:00:00 PM
17	006	9045	Corosivity - pH	Out	Gerson Galvis	2/14/2011 6:30:14 AM
17	006	9045	Corosivity - pH	In	Gerson Galvis	2/14/2011 10:19:06 AM
17	006	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:35 PM
17	006	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:17:18 AM
17	006	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:26 AM
17	006	SM4500-NH3-G	Ammonia	In	Russell Stallone	2/9/2011 5:13:00 PM
17	006	SM4500-NH3-G	Ammonia	Out	Sylvia Lukasiewicz	2/16/2011 7:17:03 AM
17	006	SM4500-NH3-G	Ammonia	In	Sylvia Lukasiewicz	2/16/2011 10:31:34 AM
19	001	8082	PCB	In	Russell Stallone	2/9/2011 5:13:04 PM
19	001	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:48 AM
19	001	8082	PCB	In	Frank Colosi	2/11/2011 7:14:24 PM
19	001	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:04 PM
19	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:17:20 AM
19	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:27 AM
20	001	8082	PCB	In	Russell Stallone	2/9/2011 5:13:01 PM
20	001	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:50 AM
20	001	8082	PCB	In	Frank Colosi	2/11/2011 7:14:26 PM
20	001	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:01 PM

WONo: 3502004 Profile Name: Vieques Profile #: 90619

20	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:17:22 AM
20	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:29 AM
21	001	8082	PCB	In	Russell Stallone	2/9/2011 5:13:03 PM
21	001	8082	PCB	Out	Frank Colosi	2/11/2011 9:02:53 AM
21	001	8082	PCB	In	Frank Colosi	2/11/2011 7:14:27 PM
21	001	Dry Weight	Dry Weight	In	Russell Stallone	2/9/2011 5:13:03 PM
21	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/11/2011 7:17:23 AM
21	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/11/2011 8:49:30 AM

WONo: 3502004 Profile Name: Vieques Profile #: 90619

MATRIX W

Sample #	Bottle	Parameter		Check	Received	Date
01	006	6010	Metals	In	Russell Stallone	2/9/2011 5:21:05 PM
01	006	6010	Metals	Out	Gerson Galvis	2/10/2011 1:01:41 PM
01	006	6010	Metals	In	Gerson Galvis	2/10/2011 1:39:31 PM
01	007	6010_D	Dissolved Metals	In	Russell Stallone	2/9/2011 5:22:03 PM
01	007	6010_D	Dissolved Metals	Out	Gerson Galvis	2/11/2011 1:03:56 PM
01	007	6010_D	Dissolved Metals	In	Gerson Galvis	2/11/2011 2:34:15 PM
01	003	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/9/2011 9:30:18 AM
01	003	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/9/2011 4:41:20 PM
01	003	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:00 PM
01	002	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/9/2011 9:20:46 AM
01	002	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/9/2011 4:41:47 PM
01	002	7196A_D	Hex Chrom Dissolved	In	Russell Stallone	2/9/2011 5:13:00 PM
01	006	7470	Mercury	In	Russell Stallone	2/9/2011 5:21:13 PM
01	006	7470	Mercury	Out	Gerson Galvis	2/10/2011 10:28:36 AM
01	006	7470	Mercury	In	Gerson Galvis	2/10/2011 12:58:43 PM
01	007	7470_D	Mercury dissolved	In	Russell Stallone	2/9/2011 5:22:03 PM
01	007	7470_D	Mercury dissolved	Out	Gerson Galvis	2/10/2011 10:29:26 AM
01	007	7470_D	Mercury dissolved	In	Gerson Galvis	2/10/2011 12:59:00 PM
01	001	8081	Pesticides	In	Russell Stallone	2/9/2011 5:23:58 PM
01	001	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:47 AM
01	008	8082L	PCB	In	Russell Stallone	2/9/2011 5:24:13 PM
01	008	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:40:01 AM
02	006	6010	Metals	In	Russell Stallone	2/9/2011 5:21:15 PM
02	006	6010	Metals	Out	Gerson Galvis	2/10/2011 1:01:46 PM
02	006	6010	Metals	In	Gerson Galvis	2/10/2011 1:39:38 PM
02	008	6010_D	Dissolved Metals	In	Russell Stallone	2/9/2011 5:22:01 PM
02	008	6010_D	Dissolved Metals	Out	Gerson Galvis	2/11/2011 1:03:59 PM
02	008	6010_D	Dissolved Metals	In	Gerson Galvis	2/11/2011 2:34:17 PM
02	005	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/9/2011 9:30:16 AM

02	005	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/9/2011 4:41:18 PM
02	005	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:00 PM
02	004	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/9/2011 9:30:44 AM
02	004	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/9/2011 4:41:45 PM
02	004	7196A_D	Hex Chrom Dissolved	In	Russell Stallone	2/9/2011 5:13:00 PM
02	006	7470	Mercury	In	Russell Stallone	2/9/2011 5:21:15 PM
02	006	7470	Mercury	Out	Gerson Galvis	2/10/2011 10:28:49 AM
02	006	7470	Mercury	In	Gerson Galvis	2/10/2011 12:58:44 PM
02	008	7470_D	Mercury dissolved	In	Russell Stallone	2/9/2011 5:22:01 PM
02	008	7470_D	Mercury dissolved	Out	Gerson Galvis	2/10/2011 10:29:29 AM
02	008	7470_D	Mercury dissolved	In	Gerson Galvis	2/10/2011 12:59:02 PM
02	007	8081	Pesticides	In	Russell Stallone	2/9/2011 5:24:00 PM
02	002	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:42 AM
02	002	8082L	PCB	In	Russell Stallone	2/9/2011 5:24:14 PM
02	007	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:56 AM
03	002	6010	Metals	In	Nicole Labus	2/10/2011 10:06:40 AM
03	002	6010	Metals	Out	Gerson Galvis	2/10/2011 1:01:49 PM
03	002	6010	Metals	In	Gerson Galvis	2/10/2011 1:39:39 PM
03	006	6010_D	Dissolved Metals	In	Nicole Labus	2/10/2011 10:06:46 AM
03	006	6010_D	Dissolved Metals	Out	Gerson Galvis	2/11/2011 1:04:02 PM
03	006	6010_D	Dissolved Metals	In	Gerson Galvis	2/11/2011 2:34:18 PM
03	003	7196A	Hex Chrom	In	Nicole Labus	2/10/2011 10:05:15 AM
03	003	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/10/2011 10:08:50 AM
03	003	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/10/2011 11:01:38 AM
03	008	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/10/2011 10:05:07 AM
03	008	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/10/2011 10:08:40 AM
03	008	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/10/2011 11:02:00 AM
03	002	7470	Mercury	In	Nicole Labus	2/10/2011 10:06:40 AM
03	002	7470	Mercury	Out	Gerson Galvis	2/10/2011 10:28:55 AM
03	002	7470	Mercury	In	Gerson Galvis	2/10/2011 12:58:45 PM
03	006	7470_D	Mercury dissolved	In	Nicole Labus	2/10/2011 10:06:46 AM

03	006	7470_D	Mercury dissolved	Out	Gerson Galvis	2/10/2011 10:29:33 AM
03	006	7470_D	Mercury dissolved	In	Gerson Galvis	2/10/2011 12:59:03 PM
03	001	8081	Pesticides	In	Nicole Labus	2/10/2011 10:22:56 AM
03	001	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:37 AM
03	005	8082L	PCB	In	Nicole Labus	2/10/2011 10:22:58 AM
03	005	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:51 AM
04	003	6010	Metals	In	Nicole Labus	2/10/2011 10:06:32 AM
04	003	6010	Metals	Out	Gerson Galvis	2/10/2011 1:01:52 PM
04	003	6010	Metals	In	Gerson Galvis	2/10/2011 1:39:41 PM
04	004	6010_D	Dissolved Metals	In	Nicole Labus	2/10/2011 10:06:53 AM
04	004	6010_D	Dissolved Metals	Out	Gerson Galvis	2/11/2011 1:04:05 PM
04	004	6010_D	Dissolved Metals	In	Gerson Galvis	2/11/2011 2:34:19 PM
04	005	7196A	Hex Chrom	In	Nicole Labus	2/10/2011 10:05:12 AM
04	005	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/10/2011 10:08:55 AM
04	005	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/10/2011 11:01:37 AM
04	006	7196A_D	Hex Chrom Dissolved	In	Nicole Labus	2/10/2011 10:05:06 AM
04	006	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/10/2011 10:08:42 AM
04	006	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/10/2011 11:01:58 AM
04	003	7470	Mercury	In	Nicole Labus	2/10/2011 10:06:34 AM
04	003	7470	Mercury	Out	Gerson Galvis	2/10/2011 10:28:58 AM
04	003	7470	Mercury	In	Gerson Galvis	2/10/2011 12:58:46 PM
04	004	7470_D	Mercury dissolved	In	Nicole Labus	2/10/2011 10:06:53 AM
04	004	7470_D	Mercury dissolved	Out	Gerson Galvis	2/10/2011 10:29:36 AM
04	004	7470_D	Mercury dissolved	In	Gerson Galvis	2/10/2011 12:59:04 PM
04	007	8081	Pesticides	In	Nicole Labus	2/10/2011 10:22:40 AM
04	007	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:31 AM
04	002	8082L	PCB	In	Nicole Labus	2/10/2011 10:23:01 AM
04	002	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:46 AM
05	002	6010	Metals	In	Russell Stallone	2/9/2011 5:21:18 PM
05	002	6010	Metals	Out	Gerson Galvis	2/10/2011 1:01:57 PM
05	002	6010	Metals	In	Gerson Galvis	2/10/2011 1:39:41 PM

05	004	6010_D	Dissolved Metals	In	Russell Stallone	2/9/2011 5:21:57 PM
05	004	6010_D	Dissolved Metals	Out	Gerson Galvis	2/11/2011 1:04:08 PM
05	004	6010_D	Dissolved Metals	In	Gerson Galvis	2/11/2011 2:34:22 PM
05	005	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/9/2011 9:30:14 AM
05	005	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/9/2011 4:41:16 PM
05	005	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:00 PM
05	001	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/9/2011 9:30:42 AM
05	001	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/9/2011 4:41:43 PM
05	001	7196A_D	Hex Chrom Dissolved	In	Russell Stallone	2/9/2011 5:13:00 PM
05	002	7470	Mercury	In	Russell Stallone	2/9/2011 5:21:18 PM
05	002	7470	Mercury	Out	Gerson Galvis	2/10/2011 10:29:02 AM
05	002	7470	Mercury	In	Gerson Galvis	2/10/2011 12:58:47 PM
05	004	7470_D	Mercury dissolved	In	Russell Stallone	2/9/2011 5:21:57 PM
05	004	7470_D	Mercury dissolved	Out	Gerson Galvis	2/10/2011 10:29:39 AM
05	004	7470_D	Mercury dissolved	In	Gerson Galvis	2/10/2011 12:59:05 PM
05	003	8081	Pesticides	In	Russell Stallone	2/9/2011 5:24:01 PM
05	008	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:26 AM
05	008	8082L	PCB	In	Russell Stallone	2/9/2011 5:24:15 PM
05	003	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:41 AM
06	003	6010	Metals	In	Russell Stallone	2/9/2011 5:21:20 PM
06	003	6010	Metals	Out	Gerson Galvis	2/10/2011 1:02:00 PM
06	003	6010	Metals	In	Gerson Galvis	2/10/2011 1:39:42 PM
06	002	6010_D	Dissolved Metals	In	Russell Stallone	2/9/2011 5:21:59 PM
06	002	6010_D	Dissolved Metals	Out	Gerson Galvis	2/11/2011 1:04:12 PM
06	002	6010_D	Dissolved Metals	In	Gerson Galvis	2/11/2011 2:34:22 PM
06	005	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/9/2011 9:30:12 AM
06	005	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/9/2011 4:41:14 PM
06	005	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:00 PM
06	001	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/9/2011 9:30:40 AM
06	001	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/9/2011 4:41:41 PM
06	001	7196A_D	Hex Chrom Dissolved	In	Russell Stallone	2/9/2011 5:13:00 PM

06	003	7470	Mercury	In	Russell Stallone	2/9/2011 5:21:20 PM
06	003	7470	Mercury	Out	Gerson Galvis	2/10/2011 10:29:05 AM
06	003	7470	Mercury	In	Gerson Galvis	2/10/2011 12:58:48 PM
06	002	7470_D	Mercury dissolved	In	Russell Stallone	2/9/2011 5:21:59 PM
06	002	7470_D	Mercury dissolved	Out	Gerson Galvis	2/10/2011 10:29:43 AM
06	002	7470_D	Mercury dissolved	In	Gerson Galvis	2/10/2011 12:59:06 PM
06	007	8081	Pesticides	In	Russell Stallone	2/9/2011 5:23:54 PM
06	006	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:20 AM
06	006	8082L	PCB	In	Russell Stallone	2/9/2011 5:24:16 PM
06	007	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:36 AM
07	006	6010	Metals	In	Russell Stallone	2/9/2011 5:21:17 PM
07	006	6010	Metals	Out	Gerson Galvis	2/10/2011 1:02:03 PM
07	006	6010	Metals	In	Gerson Galvis	2/10/2011 1:39:44 PM
07	005	6010_D	Dissolved Metals	In	Russell Stallone	2/9/2011 5:21:55 PM
07	005	6010_D	Dissolved Metals	Out	Gerson Galvis	2/11/2011 1:04:15 PM
07	005	6010_D	Dissolved Metals	In	Gerson Galvis	2/11/2011 2:34:23 PM
07	008	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/9/2011 9:30:07 AM
07	008	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/9/2011 4:41:12 PM
07	008	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:00 PM
07	007	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/9/2011 9:30:38 AM
07	007	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/9/2011 4:41:30 PM
07	007	7196A_D	Hex Chrom Dissolved	In	Russell Stallone	2/9/2011 5:13:00 PM
07	006	7470	Mercury	In	Russell Stallone	2/9/2011 5:21:17 PM
07	006	7470	Mercury	Out	Gerson Galvis	2/10/2011 10:29:09 AM
07	006	7470	Mercury	In	Gerson Galvis	2/10/2011 12:58:49 PM
07	005	7470_D	Mercury dissolved	In	Russell Stallone	2/9/2011 5:21:55 PM
07	005	7470_D	Mercury dissolved	Out	Gerson Galvis	2/10/2011 10:29:46 AM
07	005	7470_D	Mercury dissolved	In	Gerson Galvis	2/10/2011 12:59:07 PM
07	001	8081	Pesticides	In	Russell Stallone	2/9/2011 5:23:52 PM
07	002	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:15 AM
07	002	8082L	PCB	In	Russell Stallone	2/9/2011 5:24:08 PM

07	001	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:31 AM
08	007	6010	Metals	In	Russell Stallone	2/9/2011 5:21:21 PM
08	007	6010	Metals	Out	Gerson Galvis	2/10/2011 1:02:07 PM
08	007	6010	Metals	In	Gerson Galvis	2/10/2011 1:39:45 PM
08	004	6010_D	Dissolved Metals	In	Russell Stallone	2/9/2011 5:21:52 PM
08	004	6010_D	Dissolved Metals	Out	Gerson Galvis	2/11/2011 1:04:18 PM
08	004	6010_D	Dissolved Metals	In	Gerson Galvis	2/11/2011 2:34:24 PM
08	006	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/9/2011 9:30:21 AM
08	006	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/9/2011 4:41:22 PM
08	006	7196A	Hex Chrom	In	Russell Stallone	2/9/2011 5:13:00 PM
08	005	7196A_D	Hex Chrom Dissolved	Out	Sylvia Lukasiewicz	2/9/2011 9:30:48 AM
08	005	7196A_D	Hex Chrom Dissolved	In	Sylvia Lukasiewicz	2/9/2011 4:41:49 PM
08	005	7196A_D	Hex Chrom Dissolved	In	Russell Stallone	2/9/2011 5:13:00 PM
08	007	7470	Mercury	In	Russell Stallone	2/9/2011 5:21:21 PM
08	007	7470	Mercury	Out	Gerson Galvis	2/10/2011 10:29:13 AM
08	007	7470	Mercury	In	Gerson Galvis	2/10/2011 12:58:50 PM
08	004	7470_D	Mercury dissolved	In	Russell Stallone	2/9/2011 5:21:53 PM
08	004	7470_D	Mercury dissolved	Out	Gerson Galvis	2/10/2011 10:29:50 AM
08	004	7470_D	Mercury dissolved	In	Gerson Galvis	2/10/2011 12:59:08 PM
08	008	8081	Pesticides	In	Russell Stallone	2/9/2011 5:23:55 PM
08	002	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:09 AM
08	002	8082L	PCB	In	Russell Stallone	2/9/2011 5:24:10 PM
08	008	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:27 AM
09	008	8081	Pesticides	In	Russell Stallone	2/9/2011 5:23:56 PM
09	008	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 7:53:03 AM
09	007	8082L	PCB	In	Russell Stallone	2/9/2011 5:24:11 PM
09	007	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:21 AM
18	003	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:02:52 PM
18	002	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:02:56 PM
18	001	8260	Volatile Organic Compounds	In	Russell Stallone	2/9/2011 5:02:59 PM

WONo: 3502004 Profile Name: Vieques Profile #: 90619

18	002	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:13:53 AM

Addendum

Letter of Acceptance

Customer Name: CH2M Hill

Date and Time Received: 2/9/2011 9:00:00 AM

Date to be Reported: 3/4/2011

Laboratory Submission Number/SDG: 3502004

Get Detailed Analyte List here: www.pelab.com/webdms/Default.asp?LoaSDG=3502004

Project: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Samples: The submission consisted of 21 samples, including QC, with sample identification shown in the attached data tables.

Tests: The Samples will be analyzed for EPA methods: 6010, 6010_D, 6020_D_OL, 6020OL, 7196A, 7196A_D, 7470, 7470_D, 7471, 8081, 8082, 8082L, 8260, 8270_SIM, 9031OL, 9045, ASTM D422_OL, AVS-SEM-ICP_OL, LYDKHN_OL, ORP.

Sample Custody/COC discrepancies:

None.

Notes:

Samples received on 9FEB11 and 10FEB11, client notified. Samples for 6020, Lloyd Khan TOC, 9031 Sulfide, and AVS-SEM analysis will be performed by Mitkem. Samples for Grain Size analysis will be performed by Faulkner.

Distribution of Report to:

CH2M Hill
Attn: Michael Zamboni
(W): 703.376.5301

Note: Submitted material will be retained for 30 days unless otherwise requested by client or consumed in analysis. PEL letters and reports are for the exclusive use of the client to whom they are addressed. Our letters and reports apply to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar materials

Log-in Report

Level: 4

Total of: 159 analyses on 35 samples (including QC) *10-Feb-11*

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW023P-0211	350200401		W	2/8/2011 7:35:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW023-0211	350200402		W	2/8/2011 7:35:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW022-0211	350200403		W	2/8/2011 8:10:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW021-0211	350200404		W	2/8/2011 8:35:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW018-0211	350200405		W	2/8/2011 10:10:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW019-0211	350200406		W	2/8/2011 9:45:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW020-0211	350200407		W	2/8/2011 9:30:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-EB01-020811	350200408		W	2/8/2011 6:00:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010
6020_D_OL	ICP/MS Metals Outside Lab	6020
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7196A_D	Hex Chrom Dissolved	7196
7470	Mercury	7470
7470_D	Mercury dissolved	7470
8081	Pesticides	8081
8082L	PCB	8082

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-EB02-020811	350200409		W	2/8/2011 6:20:00 AM	2/9/2011 9:00:00 AM

Method		
8081	Pesticides	8081
8082L	PCB	8082

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SS012-0211	350200410		S	2/7/2011 4:10:00 PM	2/9/2011 9:00:00 AM

Method		
8082	PCB	8082
Dry Weight	Dry Weight	Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SS013-0211	350200411		S	2/7/2011 4:15:00 PM	2/9/2011 9:00:00 AM

Method		
8082	PCB	8082
Dry Weight	Dry Weight	Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD014-0211	350200412		S	2/7/2011 3:45:00 PM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD015-0211	350200413		S	2/7/2011 3:20:00 PM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD016-0211	350200414		S	2/7/2011 3:05:00 PM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD017-0211	350200415		S	2/7/2011 2:25:00 PM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD001-0211	350200416		S	2/8/2011 11:25:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD002-0211	350200417		S	2/8/2011 11:10:00 AM	2/9/2011 9:00:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM
9031OL	Sulfide	9031
9045	Corosivity - pH	9045
ASTM D422_OL	Grain Size	ASTM D422
AVS-SEM-ICP_OL	Metals	AVS-SEM-ICP
Dry Weight	Dry Weight	Dry Weight
LYDKHN_OL	Total Organic Carbon	9060 MOD
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-TB01-020811	350200418		W	2/8/2011 11:10:00 AM	2/9/2011 9:00:00 AM

Method		
8260	Volatile Organic Compounds	8260

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD13P-0211	350200419		S	2/7/2011 4:15:00 PM	2/9/2011 9:00:00 AM

Method		
8082	PCB	8082
Dry Weight	Dry Weight	Dry Weight

Report/SDG #: 3502004

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SS012-0211MS	350200420		S	2/7/2011 4:10:00 PM	2/9/2011 9:00:00 AM

Method			
8082	PCB		8082
Dry Weight	Dry Weight		Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SS012-0211SD	350200421		S	2/7/2011 4:10:00 PM	2/9/2011 9:00:00 AM

Method			
8082	PCB		8082
Dry Weight	Dry Weight		Dry Weight

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Thursday, February 10, 2011 1:43 PM
To: 'Michael.Zamboni@CH2M.com'; Vickie.Weber@ch2m.com
Cc: John.Swenfurth@CH2M.com
Subject: RE: vieques today

Good afternoon.

I apologize for not sending this earlier. We did receive the cooler with tracking number 874721126519 today. Temperature at 3.1C.

Please contact me with any questions or concerns.

Thanks!
John

From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Wednesday, February 09, 2011 11:04 AM
To: Vickie.Weber@ch2m.com; John Heyman [PEL]
Cc: Michael.Zamboni@CH2M.com; John.Swenfurth@CH2M.com
Subject: FW: vieques today

Hi John H.,

Please also send these emails to Vickie because she tracks the coolers and such. Thanks for monitoring that missing cooler. I'm sure it's not missing, rather delayed.

When you do receive it, please analyze the aqueous HexCr samples ASAP even though they are likely gross holding time exceedances. Despite our best efforts to get the samples to the laboratory on time, you just can't always rely on FedEx.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Wednesday, February 09, 2011 10:40 AM
To: Zamboni, Michael/WDC
Cc: LogIn [PEL]; Project Managers [PEL]
Subject: FW: vieques today

Mike:
Good morning.
We recieved samples from Vieques today, but it appears that we are missing a cooler. COC attached. Fed-Ex tracking number 874721126519. This cooler is still in Memphis per Fed-Ex. We recieved all samples except for sample IDs VWW-06-SW022-0211 and VWW-06-SW021-0211 (includes hex-chrome waters).
We will proceed with logging in and analyzing the samples recieved.
I will continue to monitor the tracking of the missing cooler.
Please contact me with any questions or concerns.
Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February

21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: Vickie.Weber@ch2m.com
Sent: Wednesday, February 09, 2011 5:17 PM
To: John Heyman [PEL]; Michael.Zamboni@CH2M.com
Subject: Vieques SWMU 6 corrections memo
Attachments: CTF_020911_vw.pdf

Hello John,

Please look at the attached corrections memo for updates to the COCs for the samples from Vieques SWMU 6.

Let me know if you have any questions.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 07, 2011 3:23 PM
To: Brynildsen, Victoria/VBO; Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Good to go.
Thanks!
John

From: Vickie.Weber@ch2m.com [mailto:Vickie.Weber@ch2m.com]
Sent: Monday, February 07, 2011 3:22 PM
To: Michael.Zamboni@CH2M.com; John Heyman [PEL]
Subject: RE: LOA and COC for Vieques SWMU 6

Ok...

Sorry about the confusion. The water samples are from 2/3/11 and the field team just wanted me to note that the filtered metals were field filtered as they forgot to include a note about that on the COC.

Let me know if you still have questions.

Vickie

From: Zamboni, Michael/WDC
Sent: Monday, February 07, 2011 3:05 PM
To: Brynildsen, Victoria/VBO; John Heyman [PEL]
Cc: Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Hi Vickie,

Can you please clarify this email? On 2/4/11, there should only be one aqueous sample (besides the trip blank) and it is an equipment blank which should not have been field-filtered for metals.

There were a bunch of aqueous (surface water) samples collected 2/3/11 and they were submitted for both total metals and filtered metals. Those filtered metals were field-filtered.

Thanks,
Mike Z.

From: Brynildsen, Victoria/VBO
Sent: Monday, February 07, 2011 1:55 PM
To: John Heyman [PEL]; Zamboni, Michael/WDC
Subject: RE: LOA and COC for Vieques SWMU 6

Hello John,

For Vieques SWMU 6 CTO-111, the Aqueous samples collected on 2/4/11 were field filtered for Metals.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Thursday, February 03, 2011 12:40 PM
To: Zamboni, Michael/WDC
Cc: Brynildsen, Victoria/VBO
Subject: RE: LOA and COC for Vieques SWMU 6

Will do.
Thanks!
John

From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Thursday, February 03, 2011 12:35 PM
To: John Heyman [PEL]
Cc: Victoria.Brynildsen@CH2M.com; Michael.Zamboni@CH2M.com
Subject: RE: LOA and COC for Vieques SWMU 6

Would you please include Vicki on the logins? Files reattached.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Thursday, February 03, 2011 12:33 PM
To: Zamboni, Michael/WDC
Subject: LOA and COC for Vieques SWMU 6

Good afternoon.

3501958

Let me know if anyone else should be on the LOA distribution.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

Corrections to COCs

TO: John Heyman
PEL

COPIES: File
EDD
Data Package

FROM: Victoria Weber
Environmental Information Specialist
CH2M HILL

DATE: February 9, 2011

This memo is to document corrections made to entries on the Chains of Custody (COC) for Vieques SWMU 6, CTO-111.

The following Sample IDs need to be updated.

Correct Sample ID	Incorrect Sample ID	Date	Time
VWW06-EB01-020411	VWAE-EB01-020411	2/4/2011	6:30
VWW06-TB01-020411	VWAE-TB01-020411	2/4/2011	6:45
VWW06-SD001-0211	VWW06-SD01-0211	2/8/2011	11:25
VWW06-SD002-0211	VWW06-SD02-0211	2/8/2011	11:10
VWW06-EB01-020811	VWAE-EB01-020811	2/8/2011	6:00
VWW06-EB02-020811	VWAE-EB02-020811	2/8/2011	6:20
VWW06-TB01-020811	VWAE-TB01-020811	2/8/2011	12:00
VWW06-TB01-020711	VWAE-TB01-020711	2/7/2011	6:00
VWW06-EB01-020711	VWAE-EB01-020711	2/7/2011	6:10
VWW06-EB02-020711	VWAE-EB02-020711	2/7/2011	11:20
VWW06-EB01-020311	VWAE-EB01-020311	2/3/2011	6:30
VWW06-TB04-020311	VWAE-TB04-020311	2/3/2011	11:30

COPYRIGHT 2011 BY CH2M HILL, INC. • COMPANY CONFIDENTIAL

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Monday, February 14, 2011 1:23 PM
To: 'Michael.Zamboni@CH2M.com'; Vickie.Weber@ch2m.com
Subject: 3502004 / Vieques / 7196A

Good morning.

Please note the following that will appear in the case narrative for method 7196 on SDG 3502004.

A. **Sample Analysis:** The following samples were analyzed out of hold: VWW06-EB01-020811, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, VWW06-SW023P-0211. The samples were received out of hold. The samples were analyzed as soon as possible to get as close to the holding time as possible. Samples were analyzed approximately 4 hours out of hold.

B. **Samples:**

Sample analysis proceeded normally.
Sample VWW06-SD015-0211 required a 10X dilution due to high concentration of the following analyte (s): Hexavalent Chromium.

Please contact me with any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Thursday, February 17, 2011 3:59 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: Vieques soils 3501993, 3502004 for VOCs method 8260
Importance: High

Mike:

Good afternoon.

Per your conversation with our lab manager, Brian Spann, we will be adding the note below to the 8260 case narrative for SDGs 3501993 and 3502004.

"The samples were re-run due to a computer issue that made the raw data for the original calibration data un-printable for the raw data package. The calibration data was captured by our lims system and is reported in the forms portion of the package. All the samples were re-analyzed and the raw data is reported with the re-analysis. There were some variances in the surrogate recoveries on the re-analysis so both sets of data are reported."

Please contact me with any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:10 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3502004-8082-vieques

Good afternoon.

Please note the following that will appear in the case narrative for method 8082 on SDG 3502004.

1. **Laboratory Control Spikes (LCS)**

   All acceptance criteria were met

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
   MS - VWW06-SS012-0211MS was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered above criteria: Aroclor-1260 at 133 % with criteria of (60-130). Since the LCS met criteria and the recovery was slightly above criteria the data was reported.

   Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:11 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3502004 / Vieques / 7470

Good afternoon.

Please note the following that will appear in the case narrative for method 7470 on SDG 3502004.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350200401A was analyzed with the water samples on 02/14/11. The following analyte(s) were recovered below criteria: Mercury at 65.3 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, February 23, 2011 6:11 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3502004 / Vieques / 7470_D

Good afternoon.

Please note the following that will appear in the case narrative for method 7470_D on SDG 3502004.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350200401A was analyzed with the water samples on 02/14/11. The following analyte(s) were recovered below criteria: Mercury at 68.4 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

John Heyman [PEL]

From: Vickie.Weber@ch2m.com
Sent: Wednesday, March 02, 2011 11:13 AM
To: John Heyman [PEL]
Subject: RE: Corrections Memo
Follow Up Flag: Follow up
Flag Status: Red
Attachments: CTF_030211_vw_2.pdf

Sorry one more update to time...

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Wednesday, March 02, 2011 10:49 AM
To: Brynildsen, Victoria/VBO
Subject: RE: Corrections Memo

We are currently on hold pending Mike Z.'s decision with the metals data for all reports.
The time correction may take an extra day after that.
Thanks!
John

From: Vickie.Weber@ch2m.com [mailto:Vickie.Weber@ch2m.com]
Sent: Wednesday, March 02, 2011 10:47 AM
To: John Heyman [PEL]
Subject: RE: Corrections Memo

How much of a delay are we currently looking at, if any?

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Wednesday, March 02, 2011 10:42 AM
To: Brynildsen, Victoria/VBO; Zamboni, Michael/WDC
Subject: RE: Corrections Memo

Vickie:
Good morning. I will see that these times are corrected on the final report and EDD. This may further delay the final reporting of the Vieques SMWU6 reports.
Thanks!
John

From: Vickie.Weber@ch2m.com [mailto:Vickie.Weber@ch2m.com]
Sent: Wednesday, March 02, 2011 10:30 AM
To: John Heyman [PEL]
Subject: Corrections Memo

Hello John,

Sorry for the delay in this correction, as I was going through the field notes from the project, I realized there were some time discrepancies. Please see the attached form for updates to sample times from the COC.

184

Let me know if you have questions or concerns.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 14, 2011 1:23 PM
To: Zamboni, Michael/WDC; Brynildsen, Victoria/VBO
Subject: 3502004 / Vieques / 7196A

Good morning.

Please note the following that will appear in the case narrative for method 7196 on SDG 3502004.

A. **Sample Analysis:** The following samples were analyzed out of hold: VWW06-EB01-020811, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, VWW06-SW023P-0211. The samples were received out of hold. The samples were analyzed as soon as possible to get as close to the holding time as possible. Samples were analyzed approximately 4 hours out of hold.

B. **Samples:**

Sample analysis proceeded normally.
Sample VWW06-SD015-0211 required a 10X dilution due to high concentration of the following analyte (s): Hexavalent Chromium.

Please contact me with any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

Corrections to COCs

TO: John Heyman
PEL

COPIES: File
EDD
Data Package

FROM: Victoria Weber
Environmental Information Specialist
CH2M HILL

DATE: March 2, 2011

This memo is to document corrections made to entries on the log-in for Vieques SWMU 6, CTO-111.

The following Sample times need to be updated.

Correct Sample ID	Date	Correct Time	Incorrect Time
VWW06-TB01-020811	2/8/2011	12:00	11:10

COPYRIGHT 2011 BY CH2M HILL, INC. • COMPANY CONFIDENTIAL

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 16, 2011 4:48 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3502004 / Vieques / 7470_D

Good afternoon.

Please note the following that will appear in the case narrative for method 7470D on SDG 3502004.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350200401A was analyzed with the water samples on 02/14/11. The following analyte(s) were recovered below criteria: Mercury at 68.4 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 16, 2011 4:48 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3502004 / Vieques / 6010_D

Good afternoon.

Please note the following that will appear in the case narrative for method 6010D on SDG 3502004.

1. **Calibration Blanks:**
All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Aluminum at 21.3 UG/L, Barium at 0.347 UG/L, Beryllium at 0.328 UG/L, Iron at 31.2 UG/L, Magnesium at 19.2 UG/L, Manganese at -0.401 UG/L, Potassium at 98.8 UG/L, Thallium at 4.68 UG/L.
CCB961526 was analyzed on 03/15/11 22:39. The following analyte(s) were detected below RL: Manganese at -0.779 UG/L, Nickel at -1.72 UG/L, Thallium at 4.78 UG/L.
CCB961538 was analyzed on 03/16/11 00:00. The following analyte(s) were detected below RL: Manganese at -0.79 UG/L, Nickel at -1.46 UG/L.
CCB961550 was analyzed on 03/16/11 01:23. The following analyte(s) were detected below RL: Manganese at -0.804 UG/L, Nickel at -1.58 UG/L, Vanadium at 0.486 UG/L.
CCB961560 was analyzed on 03/16/11 02:31. The following analyte(s) were detected below RL: Aluminum at 19.2 UG/L, Iron at 16.7 UG/L, Magnesium at 21.4 UG/L, Manganese at -0.771 UG/L, Nickel at -1.56 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

B. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350200402L was analyzed with the water samples on 03/15/11. The following analyte(s) exceeded criteria: Calcium at 360 % with criteria of (10), Magnesium at 360 % with criteria of (10), Potassium at 360 % with criteria of (10). The most probable cause for the analytes exceeding limits is sample matrix due to the sample requiring a 10X dilution for being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

C. Samples:
Sample analysis proceeded normally.

Sample VWW06-SW018-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW018-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.
Sample VWW06-SW019-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW019-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW020-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X

dilution with passing Internal Standard.

Sample VWW06-SW020-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW021-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW021-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW022-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW022-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW023-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW023-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Sample VWW06-SW023P-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW023P-0211 required a 50X dilution due to high concentration of the following analyte (s): Sodium.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 16, 2011 4:49 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3502004 / Vieques / 7470

Good afternoon.

Please note the following that will appear in the case narrative for method 7470 on SDG 3502004.

1. **Post Digestion Spike:**

   All acceptance criteria were met with the exception of:
   Post Digestion Spike 350200401A was analyzed with the water samples on 02/14/11. The following analyte(s) were recovered below criteria: Mercury at 65.3 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: Michael.Zamboni@CH2M.com
Sent: Thursday, March 31, 2011 7:16 PM
To: John Heyman [PEL]
Cc: Clairette.Campbell@ch2m.com; Troy.Horn@ch2m.com; Michael.Zamboni@CH2M.com
Subject: RE: 7196 soil LOD issue Vieques SWMU6 3501993

John, thanks again for sending this. We still need updated Form 1s for the following samples which belong to SDGs 3502004 and 3502037. I realize that the results won't change, but the LODs will, and they're shown on the Form 1s.

VWW06-SD017-0211
VWW06-SD016-0211
VWW06-SD015-0211
VWW06-SD014-0211
VWW06-SD002-0211*
VWW06-SD001-0211*
VWW06-SD023-0211
VWW06-SD023P-0211
VWW06-SD022-0211
VWW06-SD021-0211
VWW06-SD020-0211
VWW06-SD019-0211
VWW06-SD018-0211

* The LOD might not change for these two samples. Can't tell.

Thanks,
Mike Z.

From: Zamboni, Michael/WDC
Sent: Thursday, March 31, 2011 12:32 PM
To: John Heyman [PEL]
Cc: Campbell, Clairette/VBO; Horn, Troy/VBO; Zamboni, Michael/WDC
Subject: RE: 7196 soil LOD issue Vieques SWMU6 3501993

Hi John,

Thanks for sending this. I don't know what else you've been sending other people. I suspect you sent me these replacement pages since the nondetect results for those two samples changed. However, since all the LODs are incorrect for sediment HexCr, we'll need replacement Form 1s for all the sediment HexCr samples (because the LOD is shown next to the DL and LOQ). Then, the corrected LODs can be used to update (here, on our end), the combined EDD which contains all the data for this site/project.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]

191

Sent: Thursday, March 31, 2011 10:05 AM
To: Zamboni, Michael/WDC
Subject: 7196 soil LOD issue Vieques SWMU6 3501993

Mike:
We have corrected the issues with the adjusted LOD for 7196 soils on 3501993. Attached are Form 1s for the 7196. The non-detect values for 7196 on samples VWW06-SD004-0211 (-04) and VWW06-SD005-0211 (-05) have been adjusted.
Let me know if you would like the report and EDD revised with these values.
Also, I checked all other SDGs for Vieques SWMU6 and there are no other non-detect samples for 7196 soils (3502004 and 3502037).
Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

192

PEL, a Division of Spectrum Analytical, Inc.

8405 Benjamin Rd., Suite A
Tampa, FL 33634
(P) 813-888-9507 (F) 813-889-7128

CHAIN-OF-CUSTODY RECORD

Thursday, February 10, 2011 5:07:38 PM

WorkOrder: 3502004

Send to:
Mitkem
175 Metro Center Blvd.
Warwick, RI 02886
Phone: 401-732-3400 FAX:

Project: Vieques
Project Name Vieques/SWMU 6/402244.FI.SW.06 CTO11

Report To: John Heyman, Ext 2
Report Level: 4 MC
Report RLU or MDLU: RL U
J Code results between MDL and RL

K0215

3502004

	Sample ID	LabID	Collection Date	Date Needed	Mtx	Cont	Requested Tests: 6020.D	6020	9031	ASTM D422	AVS-SEM-ICP	LYDKHN	ORP				Comments
1	VWW06-SW023P-0211	350200401	2/8/2011 7:35:00 AM	2/23/2011	W	1	X	X									foreign samples
2	VWW06-SW023-0211	350200402	2/8/2011 7:35:00 AM	2/23/2011	W	1	X	X									
3	VWW06-SW022-0211	350200403	2/8/2011 8:10:00 AM	2/23/2011	W	1	X	X									
4	VWW06-SW021-0211	350200404	2/8/2011 8:35:00 AM	2/23/2011	W	1	X	X									
5	VWW06-SW018-0211	350200405	2/8/2011 10:10:00 AM	2/23/2011	W	1	X	X									
6	VWW06-SW019-0211	350200406	2/8/2011 9:45:00 AM	2/23/2011	W	1	X	X									
7	VWW06-SW020-0211	350200407	2/8/2011 9:30:00 AM	2/23/2011	W	1	X	X									
8	VWW06-EB01-020811	350200408	2/8/2011 6:00:00 AM	2/23/2011	W	1	X	X									
9	VWW06-SD014-0211	350200412	2/7/2011 3:45:00 PM	2/23/2011	S	1		X									
10	VWW06-SD015-0211	350200413	2/7/2011 3:20:00 PM	2/23/2011	S	1		X									
11	VWW06-SD016-0211	350200414	2/7/2011 3:05:00 PM	2/23/2011	S	1		X									
12	VWW06-SD017-0211	350200415	2/7/2011 2:25:00 PM	2/23/2011	S	1		X									
13	VWW06-SD001-0211	350200416	2/8/2011 11:25:00 AM	2/23/2011	S	1		X	X		X	X					

Comments:

		Date/Time		Date/Time
Relinquished by:	NR	2-10-11 1720	**Received by:**	Shirley NJ 2/11/11
Relinquished by:			**Received by:**	2/10/2011 5:07:38 PM 2/11/11 10:45
Relinquished by:			**Received by:**	

Airbill lost
Tracking # : 464007700782

4°c

000446/41

PEL, a Division of Spectrum Analytical, Inc.
8405 Benjamin Rd., Suite A
Tampa, FL 33634
(P) 813-888-9507 (F) 813-889-7128

CHAIN-OF-CUSTODY RECORD

Thursday, February 10, 2011 5:07:38 PM

WorkOrder: 3502004

Send to:
Mitkem
175 Metro Center Blvd.
Warwick, RI 02886
Phone: 401-732-3400 FAX:

Project: Vieques
Project Name Vieques/SWMU 6/402244.FI.SW.06 CTO11

Report To: John Heyman, Ext 2
Report Level: 4
Report RLU or MDLU: RL U
J Code results between MDL and RL

K021Y

	Sample ID	LabID	Collection Date	Date Needed	Mtx	Cont	Requested Tests: 6020.D	6020	9031	ASTM D422	AVS-SEM-ICP	LYDKHN	ORP				Comments
14	VWW06-SD002-0211	350200417	2/8/2011 11:10:00 AM	2/23/2011	S	1		X	X		X	X					

3502004

Comments:

	Date/Time		Date/Time
Relinquished by:	2-10-11 1720	**Received by:**	~~2/10/2011 5:07:38 PM~~ 2/11/11 10:45
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	

4 °C

MITKEM LABORATORIES
Sample Condition Form

Received By: [signature] Reviewed By: [signature] Date: 2/14/11 Mitkem Work Order #: K0215

Client Project: Vieques Client: PEL

1) Cooler Sealed — Yes / No

2) Custody Seal(s) — Present / Absent; Coolers / Bottles; Intact / Broken

3) Custody Seal Number(s) NA

4) Chain-of-Custody — Present / Absent

5) Cooler Temperature 4°C

IR Temp Gun ID MT-1

Coolant Condition Ice

6) Airbill(s) — Present / Absent

Airbill Number(s) airbill lost by FedEx location

7) Samples Bottles — Intact / Broken / Leaking

8) Date Received 2/14/11

9) Time Received 10:45

Preservative Name/Lot No.:

Lab Sample ID		Preservation (pH) HNO_3	H_2SO_4	HCl	NaOH	H_3PO_4	VOA Matrix	Soil Headspace or Air Bubble ≥ 1/4"
K0215	01	<2					H	
	02							
	03							
	04							
	05							
	06							
	07							
	08	<2						
	09							
	10							
	11							
	12							
	13							
K0215	14						H	

VOA Matrix Key:

US = Unpreserved Soil	A = Air
UA = Unpreserved Aqueous	H = HCl
M = MeOH	E = Encore
N = NaHSO4	F = Freeze

See Sample Condition Notification/Corrective Action Form yes / no

Form ID: QAF.0006 Rad OK yes / no

\\Bernoulli\qa_safety\Controlled Forms\QAF.0006 sample condition form

USEPA Region II
SW846 Method 8260B VOA

Date: August 2008
SOP: HW-24, Rev. 2

YES NO N/A

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3502004 LAB: PEL

SITE NAME: SWMU 6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? ☑ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. VOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? ☑ ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? ☑ ___ ___

1.3 Sample Conditions/Problems

196

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? V 040711

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R".

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ".

Sampled 2/7-8/11 Analy 2/14-17/11
Rec'd 2/9/11 Temp 1.4-3.1°C

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? — V —

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 3502004

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VWW06-SD001-0211	77
VWW06-SD002-0211	69

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	> 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	> 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	> 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water ☑ ___ ___

b. Soil ☑ ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water ☑ ___ ___

b. Soil ☑ ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, section 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. lab ☑ ___ ___

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? ☑ ___ ___

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2. ☑ ___ ___

If yes, were samples reanalyzed? ☑ ___ ___

Were method blanks reanalyzed? ☑ ___ ___

200

2A

SOIL VOLATILE ORGANIC SURROGATE RECOVERY

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG NO.: 3502004

Column(1): DB-624 ID: 0.18 (mm)

EPA Sample NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	TOT OUT	
021511BLK22	104.0	102.0	99.6	111.0			0	
021511LCS21	105.0	107.0	99.0	112.0			0	
021511LCS21D	106.0	103.0	104.0	103.0			0	
021711BLK22	93.6	96.4	105.0	91.4			0	
021711LCS21	100.0	103.0	105.0	96.8			0	
021711LCS21D	102.0	106.0	100.0	105.0			0	
VWW06-SD001-0211	86.4	83.2 *	69.6 *	96.0			2	not used
VWW06-SD001-0211RE1	101.0	99.8	114.0	101.0			0	
VWW06-SD002-0211	52.8 *	46.0 *	35.2 *	60.0 *			4	not used
VWW06-SD002-0211RE1	97.4	98.6	133.0 *	95.0			1	J

Control Limits

S1	= Dibromofluoromethane	68 -	119
S2	= Toluene d8	85 -	115
S3	= 4-Bromofluorobenzene	85 -	120
S4	= 1,2-Dichloroethane-d4	71 -	124

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

Control limit source: (lab/method) METHOD

Form II

180311 1921

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] ✓ ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Sample(Form III/Equivalent)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. ✓ ___ ___

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

A. Water [✓] ___ ___

B. Soil [✓] ___ ___

C. Med Soil [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ [✓]

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits. [ ] [✓] ___

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	**Non-Detected Spiked Compounds**
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

5.0 Matrix Spikes(Form III or equivalent)

no MS/MSD

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [ ] ___ ✓

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? [ ] ___ ✓

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

204

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

a. Water [ ] ___ ✓

b. Waste [ ] ___ ✓

c. Soil/Solid [ ] ___ ✓

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7)for each matrix. [ ] ___ ✓

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [ ] ___ ✓

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD results in conjunction with other QC criteria to determine the need for some qualification.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as well as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determine that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

206

YES NO N/A

6.0 Blank (CLP Form IV Equivalent)

6.1 Is the Method Blank Summary form present? ✓ ___ ___

6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ✓ ___ ___

6.3 Has a method blank been analyzed for each GC/MS system used ? ✓ ___ ___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject ® all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds? ✓ ___ ___

7.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are <u>not</u> used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. ✓ ___ ___

blk associated w/ samples (RE) used did not have contamination
blk assoc w/ TB had cont - no qual

YES NO N/A

7.2 Do any field/rinse blanks have positive volatile organic compound results? ✓ [ ] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

VWW06-TB01-020811

Chloromethane 0.44J ug/L (0.64)

Methylene chl 0.88J (1.3)

no qual required

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

YES NO N/A

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. ✓ ___ ___

NOTE: For the analysis of volatiles, the method requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? ✓ ___ ___

9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? ✓ ___ ___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? ✓ ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ ✓ ___

9.7 Have the appropriate number of significant figures (two) been reported? ✓ ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. ✓ ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

211

YES NO N/A

10.0 Target Analytes (CLP Form I Equivalent)

10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate [✓] ___ ___

b. Matrix spikes and matrix spike duplicates [ ] ___ ✓

c. Blanks [✓] ___ ___

d. Laboratory Control Samples [✓] ___ ___

10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate [✓] ___ ___

b. Matrix spikes and matrix spike duplicates (Mass spectra not required) [ ] ___ ✓

c. Blanks [✓] ___ ___

d. Laboratory Control Samples [✓] ___ ___

ACTION: If any data are missing, take action specified in 3.2 above.

10.3 Is chromatographic performance acceptable with respect to:

Baseline stability? [✓] ___ ___

	YES	NO	N/A
Resolution?	☑		
Peak shape?	☑		
Full-scale graph (attenuation)?	☑		

Other:_____

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? ☑

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab for missing spectra.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? ☑

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? ☑

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? ☑

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

no TICs

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

214

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ✓

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ✓

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ✓ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? [✓] ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC accedence dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? [✓] ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? ✓ ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39)qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? ✓ ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. ✓ ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

217

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] ✓ ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 GC/MS Calibration Verification (CLP Form VII Equivalent)

YES NO N/A

15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest? [✓] ___ ___

15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2). [ ] ✓ ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? [ ] ✓ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? [ ] ✓ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit
See attached Form 8			

(Attach additional sheets if necessary.)

ACTION:
1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.
2. Do not qualify non-detects when the associated IS are counts area > + 100%.
3. If the IS area is below the lower limit (< -50%), qualify all associated non-detects (U-values) "J".
4. If extremely low area counts are reported (< -25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? ☑ ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

221

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.0

Lab Code : SA Case No.: SAS No: SDG No.: 3502004

Lab File ID (Standard): 50PPB.D Date Analyzed: 2/16/2011

Instrument ID: VMS02 Time Analyzed: 12:03

GC Column: DB-624 ID: 0.18 (mm)

Matrix: (soil/water) S Heated Purge: (Y/N) Yes

		IS1 AREA	#	RT	IS2 AREA	#	RT	IS3 AREA	#	RT
	MID CAL STD	488217		7.12	345219		10.80	175880		13.62
	UPPER LIMIT	976434		7.62	690438		11.30	351760		14.12
	LOWER LIMIT	244108.5		6.62	172609.5		10.30	87940		13.12
	EPA SAMPLE NO.									
1	021711LCS21	506387		7.11	344519		10.80	161092		13.63
2	021711LCS21D	517897		7.12	363362		10.80	179901		13.63
3	021711BLK22	504666		7.11	344413		10.80	148365		13.62
4	VWW06-SD001-0211RE1	463648		7.11	290425		10.80	105033		13.63
5	VWW06-SD002-0211RE1	473226		7.12	277067		10.80	82291	*	13.63

J/UJ

IS1 = Fluorobenzene

IS2 = Chlorobenzene-d5

IS3 = 1,4-Dichlorobenzene-d4

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = -50% of internal standard area

Column used to flag internal standard area values with an asterisk

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? [ ] ✓ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

Initial analysis of samples VWW06-SD001-0211 and VWW06-SD002-0211 were not used, in favor of the re-analysis, due to non-compliant surrogate recoveries

Initial Calibration Date: 2/8/2011

RRF and %RSD Calculations:

Compound Name: vinyl chloride

Lab Value: 0.386

Area of Compound	788859
Area of Internal STD	1277822
Conc. of Internal STD	50
Conc. of Compound	80
Calculated RRF	0.386

Compound Name: ethylbenzene

Lab Value: 10.50

RRF of STD 1	0.470
RRF of STD 2	0.606
RRF of STD 3	0.533
RRF of STD 4	0.477
RRF of STD 5	0.429
RRF of STD 6	0.548
RRF of STD 7	0.539
RRF of STD 8	0.544
RRF of STD 9	0.570
Calculated % RSD	10.51

Continuing Calibration File ID: 2/14/2011

RRF and %D Calculations:

Compound Name: 4-methy-2-pentanone

Lab Value: 0.087

Area of Compound	195956
Area of Internal STD	1128191
Conc. of Internal STD	50
Conc. of Compound	100
Calculated RRF	0.087

Compound Name: ethylbenzene

Lab Value: 0.7

Average RRF	0.524
Calibration Check RRF	0.528
Calculated % D	-0.7

SAMPLE CALCULATION

Sample ID: VWW06-SD001-021011RE
Standard ID: 2/16/2011
Compound: carbon disulfide
Concnetration: 17 ug/Kg

	Water (ug/L)	Soil (ug/Kg)	Soil ug/Kg)
Area of Compound		37890	
Area of Internal STD		463648	
Conc. of Internal (ng)	250	250	
RRF of Compound		0.9065	
Dilution Factor	1	1	
Weight of Sample	NA	5.78	
Volume of Sample	5	NA	
% Moisture	NA	0.22	
Aliquot of sample	NA	NA	
Concentration	#DIV/0!	17.72	#DIV/0!

	RT of Internal STD	RT of Compound	RRT
Sample	7.112	3.193	0.449
Standard	7.114	3.196	0.449

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA 8260B/SW846

IV. PREPARATION

Soil samples were prepared by SW846/5035 for EPA8260B volatiles analysis. All aspects of sample preparation proceeded without exception.

Water samples were prepared by SW846/5030 for EPA8260B volatiles analysis. All aspects of sample preparation proceeded without exception.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met. Please note that:

Blank 021411BLKA32 was analyzed with the water samples on 02/14/11. The following analyte(s) were detected below RL: 1,2,4-Trichlorobenzene at 0.13 UG/L, Acetone at 3.7 UG/L.

No further action was necessary, since the detected hits are below the RL. Samples coded accordingly.

C. Surrogates:

All acceptance criteria were met with the exception of:

Sample VWW06-SD001-0211 was recovered below criteria for the following surrogate(s): 4-Bromofluorobenzene at 69.6 % with criteria of (85-120), Toluene d8 at 83.2 % with criteria of (85-115). This sample was reanalyzed with acceptable criteria. No further action was taken.

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

Sample VWW06-SD002-0211 was recovered below criteria for the following surrogate(s): 1,2-Dichloroethane-d4 at 60 % with criteria of (71-124), 4-Bromofluorobenzene at 35.2 % with criteria of (85-120), Dibromofluoromethane at 52.8 % with criteria of (68-119), Toluene d8 at 46 % with criteria of (85-115). This sample was reanalyzed. See below.

Sample VWW06-SD002-0211RE1 was recovered above criteria for the following surrogate(s): 4-Bromofluorobenzene at 133 % with criteria of (85-120). No further action was taken, since all PW vials were consumed. Both sets of data are reported.

Samples coded accordingly.

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met. Please note that:

LCS 021711LCS21 was analyzed with the soil samples on 02/17/11. The following analyte(s) were recovered above criteria:
Dichlorodifluoromethane at 142 % with criteria of (35-135).

No further action was required, since marginal exceedance criteria were met. Samples coded accordingly.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

E. Internal Standards:

All acceptance criteria were met with the exception of:

Sample VWW06-SD002-0211RE1 did not meet criteria for the following internal standard(s): 1,4-Dichlorobenzene-d4.

No further action was taken, since all PW vials were consumed. Samples coded accordingly.

F. Samples:

Sample analysis proceeded normally.

The soil samples were re-run due to a computer issue that made the raw data for the original calibration data un-printable for the raw data package. The calibration data was captured by our lims system and is reported in the forms portion of the package. All the samples were re-analyzed after the instrument was recalibrated and the raw data is reported with the re-analysis. The recalibration chromatograms are available in the raw data package. There were some variances in the surrogate recoveries on the re-analysis

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

so both sets of data are reported. No further action was taken, since both sets of low level PW vials were consumed.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Lisa Pelo Title: VOA Manager

SIGNED: **DATE:** 03/02/2011

YES NO N/A

E - The concentration of this analyte exceeds the calibration range of the instrument.

A - Indicates a Tentatively Identified Compound (TIC) is a suspected adol-condensation product.

X,Y,Z- Laboratory defined flags. The data reviewer must change these qualifiers during validation so that the data user may understand their impact on the data.

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3502004 LAB: PEL

SITE NAME: SWMU 6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format? [✓] ___ ___

ACTION: If not, note the effect on review of the data in the data assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? [✓] ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? [✓] ___ ___

YES NO N/A

II. SEMIVOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? [✓] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ✓ [ ] ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, all non-detects data are qualified as unusable (R), and detects are flagged "J".

ACTION: If samples were not iced, or if the ice was melted upon arrival at the laboratory and the cooler temperature was elevated (10°C), flag all positive results "J" and all non-detects "UJ". Temp 1.4-3.1°C

Sampled 2/7-8/11 Extr 2/10/11
Recd 2/9/11 Analy 2/21-24/11

2.0 Holding Times

2.1 Have any semivolatile technical holding times, determined from date of collection to date of extraction, been exceeded? ___ [✓] ___

Continuous extraction of water samples for semivolatile analysis must be started within **7** days of the date of collection. Soil/sediment samples must be extracted within **14** days of collection. Extracts must be analyzed within

225

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 3502004

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VWW06-SD001-0211	77
VWW06-SD002-0211	69

YES NO N/A

40 days of the date of extraction.

Table of Holding Time Violations

(See Traffic Report)

Sample ID	Sample Matrix	Date Sampled	Date Lab Received	Date Extracted	Date Analyzed

ACTION: If technical holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

231

	YES	NO	N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Have the semi volatile surrogate recoveries been listed on CLP Surrogate Recovery forms (Form II) for each of the following matrices:

a.	Low Water	[ ]	___	___
b.	Low/Med Soil	[✓]	___	___

3.2 If so, are <u>all the samples listed</u> on the appropriate Surrogate Recovery Summary forms for each matrix:

a.	Low Water	[ ]	___	___
b.	Low/Med Soil	[✓]	___	___

ACTION: If CLP deliverables are unavailable, document the effect(s) in data assessments. In some cases the lab may have to be contacted to obtain the data necessary to complete the validation.

3.3 Were outliers marked correctly with an asterisk? [ ] ___ ✓

ACTION: Circle all outliers in red.

3.4 Were two or more base neutral <u>OR</u> acid surrogate recoveries out of specification for any sample or method blank (Reviewer should use lab in house recovery limits. Use surrogate recovery limits from USEPA National Functional Guidlines January 2005 page 130, if in house limits are not available. See Method 8000B-43 or 80000C-24). [ ] ✓ ___

Note: Examine lab in house limits for reasonableness.

If yes, were samples re-analyzed? [ ] ___ ✓

232

	YES	NO	N/A
Were method blanks re-analyzed?	[ ]	___	✓

ACTION: If all surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet method specifications, <u>for the affected fraction only (i.e. either base-neutral or acid compounds):</u>

1. Flag all positive results as estimated ("J").

2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.

3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any base-neutral <u>or</u> acid surrogate has a recovery of < 10%:

1. Positive results for the fraction with < 10% surrogate recovery are qualified with "J".

2. Non-detects for that fraction should be qualified as unusable (R) .

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

3.5 Are there any transcription/calculation errors between raw data and Form II?	___	✓	___

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and document

YES NO N/A

effect in data assessments.

No MS/MSD

4.0 Matrix Spikes (Form III/Equivalent)

4.1 Have the semivolatile Matrix Spike and Matrix Spike Duplicate/or duplicate unspiked Sample recoveries been listed on the Recovery Form (Form III)? [ ] ___ ✓

NOTE: Method 3500B/page 4 states the spiking compounds:

Base/neutrals	Acids
1,2,4-Trichlorobenzene	Pentachlorophenol
Acenaphthene	Phenol
2,4-Dinitrotoluene	2-Chlorophenol
Pyrene	4-Chloro-3-methylphenol
N-Nitroso-di-n-propylamine	4-Nitrophenol
1,4-Dichlorobenzene	

Note: Some projects may require the spiking of specific compounds of interest.

Note: See Method 8270D-sec 8.4.2 for deciding on whether to prepare and analyze duplicate samples or a martix spike/matrix spike duplicate. If samples are expected to contain target analytes, then laboratory may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, laboratory should use a matrix spike and matrix spike duplicate pair.

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [ ] ___ ✓

b. Low Solid [ ] ___ ✓

c. Med Solid [ ] ___ ✓

YES NO N/A

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above. It may be necessary to contact the lab to obtain the required data.

NOTE: If the data has not been reported on CLP equivalent form, then the laboratory must provide the information necessary to evaluate the spike recoveries in the MS and MSD. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

4.3 Were matrix spikes performed at concentration equal to 100ug/L for acid compounds, and 200ug/l for base compounds (Method 3500B-4), or those specified in project plan. [ ] ___ ✓

4.4 How many semivolatile spike recoveries are outside Laboratory in house MS/MSD recovery limits (use recovery limits values in Method 8270D-43&44 Table 6 if in house values not available).

Water

____ out of ____

Solids

____ out of ____

YES NO N/A

4.5 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Solids
____ out of ____	____ out of ____

ACTION: Circle all outliers with red pencil.

ACTION: No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the matrix spike and matrix spike duplicate results in conjunction with other QC criteria to determine the need for some qualification of the data.

4.6 Was a Laboratory Control Sample (LCS) analyzed with each analytical batch? ✓ ___ ___

NOTE: When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

5.0 Blanks (Form IV/Equivalent)

5.1 Is the Method Blank Summary (Form IV) present? ✓ ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported per 20 samples of similar matrix, or concentration level, and for each extraction batch? ✓ ___ ___

5.3 Has a method blank been analyzed either after

	YES	NO	N/A
the calibration standard or at any other time during the analytical shift for each GC/MS system used ?	✓		

ACTION: If any method blank data are missing, call lab for explanation/resubmittal. If not available, use professional judgement to determine if the associated sample data should be qualified.

5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra. Is the chromatographic performance (baseline stability) for each instrument acceptable for the semivolatiles?	✓		

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.		✓	
6.2 Do any field/rinse/ blanks have positive results for target analytes and/or TICs (if required, see section 10 below)?			✓

YES NO N/A

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks. If gross contamination exists, all data in the associated samples should be qualified as unusable (R).

YES NO N/A

Blank Action for Semivolatile Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification required
	< CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	= CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report concentration of sample with a U
		≥ CRQL and ≥ blank contamination	No qualification required

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: If the laboratory did not report TIC analyses, check the project plans to verify whether or not it was required.

6.3 Are there field/rinse/equipment blanks associated with every sample? [ ] ✓ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

6.4 Was a instrument blank analyzed after each sample/dilution which contained a target compound

	YES	NO	N/A
that exceeded the initial calibration range.	[ ]	___	✓
6.5 Does the instrument blank have positive results for target analytes and/or TICs?	___	[ ]	✓

Note: Use professional judgement to determine if carryover occurred and qualify analytes accordingly.

7.0 GC/MS Apparatus and Materials

7.1 Did the lab use the proper gas chromatographic column for analysis of semivolatiles by Method 8270D? Check raw data, instrument logs or contact the lab to determine what type of column was used. The method requires the use of 30 m x 0.25 mm ID (or 0.32 mm ID), silicone-coated, fused silica, capillary column.	[✓]	___	___

ACTION: If the specified column, or equivalent, was not used, document the effects in the data assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (Form V/Equivalent)

8.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for decafluorotriphenylphosphine (DFTPP)?	[✓]	___	___

NOTE: The performance solution should also contain 4,4-DDT, pentachlorophenol, and benzidine to verify injection port inertness and column performance. The degradation of DDT to DDE and DDD must be less than 20% total and the response of pentachlorophenol and benzidine should be within normal ranges for these compounds (based upon lab experience) and show no peak degradation or tailing before samples are analyzed. (see section 5.5

YES NO N/A

page 8270D-12).

8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? ✓ ___ ___

8.3 Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument? ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable (R).

8.4 Have the ion abundances been normalized to m/z 198? ✓ ___ ___

8.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

	YES	NO	N/A
ACTION: If ion abundance criteria are not met, take action specified in section 3.2			
8.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.)		✓	
8.7 Have the appropriate number of significant figures (two) been reported?	✓		
ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document effect in data assessments.			
8.8 Are the spectra of the mass calibration compound acceptable?	✓		
ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			
9.0 Target Analytes			
9.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates			✓
c. Blanks	✓		
9.2 Has any special cleanup, such as GPC, been performed on all soil/sediment sample extracts (see section 7.2, page 8270D-14)?		✓	

	YES	NO	N/A

ACTION: If data suggests that extract cleanup was not performed, use professional judgement. Make note in the data assessment narrative.

9.3 Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate	☑		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	☐		☑
c. Blanks	☑		

ACTION: If any data are missing, take action specified in 3.2 above.

9.4 Are the response factors shown in the Quant Report?	☑		
9.5 Is chromatographic performance acceptable with respect to:			
Baseline stability?	☑		
Resolution?	☑		
Peak shape?	☑		
Full-scale graph (attenuation)?	☑		
Other:_____	☐		

ACTION: Use professional judgement to determine the acceptability of the data.

9.6 Are the lab-generated standard mass spectra of identified semivolatile compounds present for

	YES	NO	N/A
each sample?	✓		

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the data assessment narrative. If spectra are missing, reject all positive data.

9.7 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	✓		
9.8 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?	✓		
9.9 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum?	✓		

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R), flagged "N" (Presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 9.7, 9.8, and 9.9.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

244

YES NO N/A

10.0 Tentatively Identified Compounds (TIC)

10.1 If Tentatively Identified Compounds were required for this project, are all Form Is, Part B present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier? NO TICs

NOTE: Review sampling reports to determine if the lab was required to identify non target analytes (refer to section 7.6.2,page 8270D-21).

10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following: [ ] ___ ___ ✓

a. Samples and/or fractions as appropriate [ ] ___ ___ ✓

b. Blanks [ ] ___ ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by CAS #.

10.3 Are any target compounds from one fraction listed as TIC compounds in another (e.g., an acid compound listed as a base neutral TIC)? ___ [ ] ___ ✓

ACTION: i. Flag with "R" any target compound listed as a TIC.

ii. Make sure all rejected compounds are properly reported in the other fraction.

10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the

	YES	NO	N/A
sample mass spectrum?	[ ]	___	✓
10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%?	[ ]	___	✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate and remove "JN". Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R."

11.0 Compound Quantitation and Reported Detection Limits

11.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	✓	___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

11.2 Are the method detection limits adjusted to reflect sample dilutions and, for soils, sample moisture?	✓	___	___

240

YES NO N/A

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original Form I (if present) and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red " X" across the entire page of all Form I's that should not be used, including any in the summary package.

12.0 Standards Data (GC/MS)

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant, Reports) present for initial and continuing calibration? ✓ ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

13.0 GC/MS Initial Calibration (Form VI/Equivalent)

13.1 Is the Initial Calibration Form (Form VI/ Equivalent) present and complete for the semivolatile fraction? ✓ ___ ___

ACTION: If any calibration forms or standard row data are missing, take action specified in 3.2 above.

13.2 Are all base neutral or acid RRFs > 0.050? ✓ ___ ___

YES NO N/A

Check the **average RRFs** of the four System Performance Check Compounds (SPCCs): N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and 4-nitrophenol. These compounds must have **average RRFs** greater than or equal to 0.05 before running samples and should not show any peak tailing.

ACTION: Circle all outliers in red.

ACTION: For any target analyte with **average RRF <0.05**

1. "R" all non-detects;

2. "J" all positive results.

13.3 Are response factors for base neutral or acid target analytes stable over the concentration range of the calibration (% Relative standard deviation [%RSD] < 20.0%)? ✓ ___ ___

NOTE: The % RSD for each individual Calibration Check Compound (CCC, Method 8270D-40 see Table 4) must be less than 30% before analysis can begin. If grater 30%, the lab must clean and recalibrate the instrument.

CALIBRATION CHECK COMPOUNDS

Base/Neutral Fraction	Acid Fraction
Acenaphthene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2,4-Dichlorophenol
Hexachlorobutadiene	2-Nitrophenol
Diphenylamine	Phenol
Di-n-octyl phthalate	Pentachlorophenol
Fluoranthene	2,4,6-Trichlorophenol

YES NO N/A

Benzo(a)pyrene

ACTION: If the %RSD for any CCC >30% and no corrective action taken, then "J" qualify all positive hits and "UJ" qualify all non-detects.

ACTION: Circle all outliers in red.

ACTION: If the % RSD is ≥ 20.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, flag all non- detect results for that analyte "R," unusable. Alternatively, the lab should calculate first or second order regression fit of the calibration curve and select the fit which introduces the least amount of error.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

13.4 Did the laboratory calculate the calibration curve by the least squares regression fit? ___ [✓] ___

13.5 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or % RSD? (Check at least two values but if errors are found, check more.) ___ [✓] ___

ACTION: Circle Errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in data assessments.

13.5 Do the target compounds for this SDG include Pesticides? [ ] ___ ✓ ___

YES NO N/A

13.6 If the pesticide compounds include DDT, was the percent breakdown of DDT to DDD and DDE greater than 20%? ___ [ ] ✓

ACTION: If DDT percent breakdown exceeds 20%:

i. Qualify all positive results for DDT with "J". If DDT was not detected, but DDD and DDE results are positive, qualify the quantitation limit for DDT as unusable, "R".

ii. Qualify all positive results for DDD and DDE as presumptively present at an approximate concentration "JN".

14.0 GC/MS Calibration Verification (Form VII/Equivalent)

14.1 Are the Calibration Verification Forms (Form VII) present and complete for all compounds of interest? [✓] ___ ___

14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

_____

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed within twelve hours of every sample analysis,

YES NO N/A

call lab for explanation/resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").

14.3 Do any of the SPCCs have an RRF <0.05? ___ [✓] ___

If YES, make a note in data assessment if the lab did not take corrective action specified in section 7.4.4, page 8270D-18. [ ] ___ ___

14.4 Do any of the CCCs have a %D between the initial and continuing RRF which exceeds 20.0%?

ACTION: If yes, make a note in data assessment.

14.5 Do any semivolatile compounds have a % Difference (% D) between the initial and continuing RRF which exceeds 20.0%? ___ [✓] ___

ACTION: Circle all outliers in red.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated (J). When %D is above 90%, qualify all non-detects for that analyte as "R", unusable.

14.6 Do any semivolatile compounds have a RRF < 0.05? ___ [✓] ___

ACTION: Circle all outliers in red.

ACTION: If RRF < 0.05, qualify as unusable ("R") associated non-detects and "J" associated positive values.

14.7 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or percent difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more). ___ [✓] ___

251

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

YES NO N/A

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect(s) in the data assessments.

15.0 Internal Standards (Form VIII)

15.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to + 100%) for each continuing calibration? ✓ ___ ___

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area	LowerLimit	Upper Limit

(Attach additional sheets if necessary.)

Note: Check Table 5, 8270D-41 for associated analytes.

ACTION: i. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard.

ii. Non-detects associated with IS > 100% should not be qualified.

YES NO N/A

iii. If the IS area is below the lower limit (<50%), qualify all associated non-detects (U-values) "J". If extremely low area counts are reported (<25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable (R).

15.2 Are the retention times of all internal standards within 30 seconds of the associated calibration standard? [✓] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Laboratory Control Samples (LCS)

NO MS Rec

16.1 Were any LCS samples run in order to verify analytes which failed criteria for spike recovery? [✓] 04/07/11 ___ ✓

16.2 Did the lab spike LCS sample spiked with the same analytes and the same concentrations as the matrix spike? [ ] ___ ✓

16.3 Were the mean and standard deviation of all analytes within the QC acceptance ranges as shown in Table 6, 8270D-43? [✓] ___ ___

ACTION: If the recovery of any analyte falls out of the designated range, the analytical results for that compound is suspect and should be qualified "J" in the unspiked samples.

17.0 Field Duplicates

17.1 Were any field duplicates submitted for semivolatile analysis? [ ] ✓ ___ ___

Initial Calibration Date: 2/16/2011

RRF and %RSD Calculations:

Compound Name: napthalene

Lab Value: 1.067

Area of Compound	549958
Area of Internal STD	41245
Conc. of Internal STD	0.8
Conc. of Compound	10
Calculated RRF	1.067

Compound Name: benzo(g,h,i)perylene

Lab Value: 7.10

RRF of STD 1	1.571
RRF of STD 2	1.378
RRF of STD 3	1.222
RRF of STD 4	1.361
RRF of STD 5	1.268
RRF of STD 6	1.460
RRF of STD 7	1.375
RRF of STD 8	1.420
RRF of STD 9	1.432
RRF of STD 10	1.450
Calculated % RSD	7.10

Continuing Calibration File ID: 2/24/2011

RRF and %D Calculations:

Compound Name: chrysene

Lab Value: 1.186

Area of Compound	34921
Area of Internal STD	47112
Conc. of Internal STD	0.8
Conc. of Compound	0.5
Calculated RRF	1.186

Compound Name: phenanthrene

Lab Value: 3.2

Average RRF	1.12104
Calibration Check RRF	1.157
Calculated % D	-3.2

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

b

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8270D.

IV. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8270 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met with the exception of:
LCS 70809LCS was analyzed with the soil samples extracted on 02/10/11. The following analyte(s) were recovered below criteria: 1-Methylnaphthalene at 68.1 % with criteria of (77-140).

Samples coded accordingly. Since just one was recovered only slightly low, no further action was taken.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.
Sample VWW06-SD002-0211 required a 10X dilution due to matrix interference that caused internal standard failures when analysis was attempted multiple times at lesser dilution factors.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: **Name:** Brian C. Spanh **Title:** Lab Director

SIGNED: **DATE:**
03/04/2011

USEPA Region II
SW846 Method 8081B Pesticides

Date: October 2006
SOP HW-44, Rev.1.0

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 3502004
LAB: PEL SITE: Vieques SWMU 6

1.0 Data Completeness and Deliverables	YES	NO	N/A
1.1 Has all the data been submitted in CLP deliverable format?	☑	☐	☐
1.2 Have any missing deliverables been received and added to the data package? corrections/resubs received	☐	☐	☑

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter; SDG Narrative	YES	NO	N/A
2.1 Is a laboratory narrative or cover letter present?	☑	☐	☐
2.2 Are the case number and/or SDG number contained in the narrative or cover letter?	☑	☐	☐

3.0 Data Validation Checklist	YES	NO	N/A
3.1 Does this data package contain:			
Water data?	☑	☐	☐
Waste data?	☐	☐	☑
Soil/solid data?	☑	☐	☐

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Tuesday, April 19, 2011 6:07 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs
Attachments: P1598.pdf; P1469.pdf; P4026.pdf; P3933.pdf; P3316.pdf; P2995.pdf; P1385.pdf; P1193.pdf; P2427.pdf; P2727.pdf; P2850.pdf; P1275.pdf; P1518.pdf; P1612.pdf

Jackie:
Good afternoon.
I have attached revised 8081/8082 prep logs. The Clean up used (if any) can be found in the 2nd to the last column on the Extraction Logs.
Please contact me with any questions or concerns.
These pages have been paginated with the SDG number at the bottom of each page for reference.
Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Friday, April 15, 2011 9:52 AM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Hi John,

Please tell me where I would find this information in the prep. logs. I see a list of solvents, etc. at the end of the extraction page but don't know if that indicates that something was done. For example – on the pesticides for SDG 3501993 p 2996 florisil is mentioned with a number. However, the statement below suggests that there was no florisil clean-up performed. I need to be able to see what you have done as Region II questions are very specific on their DV check-lists. If clean-ups are performed, exactly where would they be listed in the logs? Thanks for further clarification!

Jackie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Friday, April 15, 2011 8:14 AM
To: John Heyman [PEL]; Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Jackie:
Per our Lab Manager:

If we perform clean ups then:

Only copper clean ups performed on the 8081. If we perform any clean ups then all the samples and QC would go through the same clean up steps.
PCBs get copper and acid treated, again all QC receive the same treatment.

This should have been noted in the prep logs if performed.

Let me know if you need any additional information.

Thanks!
John

From: Mark Gudnason [PEL] **On Behalf Of** John Heyman [PEL]
Sent: Thursday, April 14, 2011 4:49 PM
To: Jacqueline Cleveland; John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: Question RE- Pesticides & PCBs

Jackie,

John has left for the day but will address this asap tomorrow.

Mark

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, April 14, 2011 4:07 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: FW: Question RE- Pesticides & PCBs
Importance: High

Hi John,

I am just verifying that you received the question noted below! Thank you.

Jackie

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Wednesday, April 13, 2011 8:04 PM
To: 'John Heyman [PEL]'
Cc: 'DataQual Environmental Services, LLC'; 'Michael.Zamboni@CH2M.com'; 'Vickie.Weber@ch2m.com'
Subject: Question RE- Pesticides & PCBs

Good Morning John,

Quick question on the extraction procedures for the Pesticides and PCBs. I need to know what clean-up procedures were used on the sample extracts and whether or not any QC checks were performed to verify the procedures. If there were clean-up checks (for example – florisil cartridge checks) please include results of those checks in your response. Thanks for your help!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

266

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8081.

IV. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8081 semi-volatile analysis.
Water samples were prepared by SW846 EPA 3510 for 8081 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

E. Internal Standards:

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

This method does not require the use of internal standards.

F. Samples:

Sample analysis proceeded normally.

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:

Name: Brian C. Spaan Title: Lab Director

SIGNED: **DATE:**
03/03/2011

ORGANOCHLORINE PESTICIDE

	YES	NO	N/A
1.0 Traffic Reports and Laboratory Narrative			
1.1 Are traffic report and chain-of-custody forms present for all samples?	[ ]	___	___
ACTION: If no, contact lab for replacement of missing or illegible copies.			
1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	✓	[ ]	___
ACTION: If any sample analyzed as a soil, other than than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, all non detects are qualified as unusable, "R", and positive results flagged "J".	all SS < 50% Solid - J/UJ		
ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".			
2.0 Holding Times			
2.1 Have any organochlorine pesticide technical holding times, determined from date of collection to date of extraction, been exceeded?	___	[V]	___

Water and waste samples for organochlorine pesticide analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

ACTION: Qualify sample results according to Table 1.

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J*	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

YES NO N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste ☑ ___ ___

b. Soil/Solid ☑ ___ ___

3.2 Are all the pesticide samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water ☑ ___ ___

b. Waste ☐ ___ ☑

c. Soil/Solid ☑ ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between 30-150% for all samples, including MS and MSDs, LCSs and all blanks? lab QC limits ☑ ___ ___

Note: Reviewer shall use lab in-house recover limits if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate action Table 2.

3.5 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? ☑ ___ ___

ACTION: Follow surrogate action, Table 2 below.

YES NO N/A

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample(LCS)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples. ✓ [ ] ___ ___

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

YES NO N/A

4.2 Were Laboratory Control Samples analyzed at the required concentration for all analytes of interest as specified ~~in Table 3 below.~~ lab SOP/client SAP ☑ ___ ___

Note: Use lab in-house criteria, if available.

Table 3. LCS Spiking Criteria

LCS Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml	Recovery Limits (%)
gamma-BHC	0.05	1	50-120
Heptachor epoxide	0.05	1	50-120
Dieldrin	0.01	1	30-130
4,4'-DDE	0.01	1	50-150
Endrin	0.01	1	50-120
Endosulfan sulfate	0.01	1	50-120
gamma-Chloradane	0.05	1	30-130
Tetrachloro-m-xylene(surrogate)	0.20	3	30-150
Decachlorobiphenyl (surrogate)	0.40	3	30-150

Note: The LCS might be spiked with the same analytes at the same concentration as the matrix spike.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in ~~table above?~~ lab SOP/client SAP ☑ ___ ___

266

YES NO N/A

ACTION: For LCS % recovery not meeting the required recovery, follow the required action in Table 4 below.

Table 4. LCS Recovery Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Upper Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [ ] ✓ ___

NOTE: For soil and waste samples showing detectable amounts of organics, the lab may substitute replicate samples in place of the matrix spike (see page 8000B-40, section 8.5.3). No Spike included

5.2 Have MS/MD or MS/MSD results been summarized on Form III/Equivalent? [ ] ___ ✓

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000B-39, section 8.5.])

	YES	NO	N/A
a. Water	[ ]	___	✓
b. Waste	[ ]	___	✓
c. Soil/Solid	[ ]	___	✓

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 We Were Matrix Spike Samples analyzed at the required concentration for all analytes of interest as specified in Table 5 below. [ ] ___ ✓

Note: Spiking analytes may differ from those in Table 5. Check QA project plan or task order.

Table 5. Matrix Spiking Criteria

Matrix Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml
gamma-BHC	0.05	1
Heptachor	0.05	1
Aldrin	0.05	1
Dieldrin	1.0	1
Endrin	1.0	1
4,4'-DDT	1.0	1

Note: For aqueous organic extractable, the spike concentration should be:

1) For regulatory compliance monitoring - the regulatory concentration limit or 1 to 5 times the expected background concentration, whichever is higher;

2) For all other aqueous samples - the larger of either 1 to 5 x times the expected background

YES NO N/A

concentration, or the same as the QC check sample concentration (see section 4 above);

3) For soil/solid and waste samples - the recommended concentration is 20 times the estimated quantitation limit (EQL).

No action is taken based on MS or replicate data alone. However, using informed professional judgement, the data reviewer may use the matrix spike or laboratory replicate results in conjunction with other QC criteria and determine the need for some qualification of the data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples.

5.5 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in Table 6 below. [ ] ___ ✓

Note: Use lab in-house criteria, if available.

Table 6. Matrix Spike Recovery Criteria

Compound	% Recovery Water	RPD Water	% Recovery Soil	RPD Soil
gamma-BHC	56-123	0-15	46-127	0-50
Heptachor	40-13	0-20	35-130	0-31
Aldrin	40-120	0-22	34-132	0-43
Dieldrin	52-126	0-18	31-134	0-38
Endrin	56-121	0-21	42-139	0-45
4,4'-DDT	38-127	0-27	23-134	0-50

NOTE: The actual number of MS analytes depends on the number analytes being measured (e.g., total number of MS plus MSD compounds). If only chlordane or toxaphene are the analytes of

YES NO N/A

interest, the spiked sample should contain the most representative multi-component analyte.

ACTION: Follow the matrix spike actions (Table 7) for pesticide analyses.

Table 7. Matrix Spike Qualifying Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% R ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limit	No qualifications	

Note: When the results of the matrix spike analyses indicates a potential problem due to the sample matrix itself, the LCS results are used to verify the laboratory can perform analyses in a clean matrix.

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on Method Blank Summary form(s) (Form IV)?

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ✓ ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any other time during the analytical shift.

270

YES NO N/A

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for pesticides? ✓ ___ ___

ACTION: Use professional judgement to determine the effect on the data.

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for organochlorine pesticides? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ ✓ ___

7.2 Do any field/rinse blanks have positive organochlorine pesticide results? ___ ✓ ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in

YES NO N/A

another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 8 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 8. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying the calibration criteria.

Note: When applied as described in Table 8 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams", "junk peaks"), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference.

272

YES NO N/A

Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? [4] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic column used for the analysis of organochlorine pesticides? Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (See Method 8081B-8, section 4.2) [4] ___ ___

8.2 If capillary columns were used, were they both wide bore (.53 mm ID) fused silica GC columns, such as DB-608 and DB-1701 or equivalent. Indicate the specific type of column used for:

column 1: STX CLP 1

column 2: STX CLP 2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. DDT/endrin breakdown check [4] ___ ___

	YES	NO	N/A
b. toxaphene	✓		
c. technical chlordane	✓		✓
d. 5 pt. initial calibration standards	✓		
e. calibration verification standards	✓		
f. LCS	✓		
g. Method blanks	✓		

ACTION: If no, take action specified in 3.2 above.

9.2 Has a DDT/endrin breakdown check standard (at the mid-concentration level) been analyzed at the beginning of each analytical sequence on both columns (page 8081B-24, section 8.2.3)? ✓

ACTION: If no, take action as specified in 3.2 above.

9.3 Has the individual % breakdown exceeded 20.0% on either column for:

- 4,4' - DDT? ✓
- endrin? ✓

ACTION: If any % breakdown has failed the QC criteria in the breakdown check standard, qualify all sample analyses in the entire analytical sequence as described below.

a. If 4,4'-DDT breakdown is greater than 20.%:

i. Qualify all positive results for DDT with 'J". If DDT was not detected, but DDD and DDE are positive, then qualify the quantitation limit for DDT as unusable ("R").

ii. Qualify positive results for DDD and DDE as presumptively present at an approximated quantity ("NJ").

YES NO N/A

b. If endrin breakdown is greater than 20.0%:

i. Qualify all positive results for endrin with "J". If endrin was not detected, but endrin aldehyde and endrin ketone are positive, then qualify the quantitation limit for endrin as unusable ("R").

ii. Qualify positive results for endrin ketone and endrin aldehyde as presumptively present at an approximated quantity ("NJ").

9.4 Are data summary forms (containing calibration factors or response factors) for the initial 5 pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? [4] ___ ___

NOTE: If internal standard calibration procedure is used (page 8000B-16, section 7.4.2.2), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (page 8000B-16, section 7.4.2.1), then calibration factors must be used.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.5 Are there any transcription/calculation errors between raw data and data summary forms. ___ [4] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.6 Are standard retention time (RT) windows for each analyte of interest presented on modified CLP summary forms? [4] ___ ___

YES NO N/A

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all pesticides are established using retention times from three calibration standards analyzed during the entire analytical sequence (page 8081B-15, section 7.4.6).

A 72 hr. sequence is not required with this method, however, the method states that best results are obtained using retention times which span the entire sequence; i.e., using the mid level from the 5 pt. calibration, one of the mid-concentration standards analyzed during mid-sequence and one analyzed at the end.

9.7 Were RT windows on the confirmation column established using three standards ~~as described above?~~ Per lab SOP — Y — —

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.6 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.8 Do all standard retention times in each level of the initial 5 pt. calibrations for pesticides fall within the windows established during the initial calibration sequence? Y — —

ACTION: i. If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standards, spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows

YES NO N/A

may be too tight. If so, RT windows should be recalculated as per page 8081B-15, section 7.4.6.2

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

ACTION: For toxaphene and chlordane, the RT may be outside the RT window, but these analytes may still be identified from their individual patterns.

9.9 Has the linearity criteria for the initial calibration standards been satisfied for both columns? (% RSD must be < allowable limits* for all analytes). ✓ ___ ___

ACTION: If no, follow the actions in Table 9 below.

Table 9. Initial Calibration Linearity Criteria

Criteria	Criteria	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD exceeds allowable limits*	J	No qualification
% RSD within allowable limits*	NO qualifications	

* %RSD ≤ 20% for single component compounds except alpha-BHC and delta-BHC.
%RSD ≤ 25% for alpha-BHC and delta-BHC
%RSD ≤ 30% for Toxaphene peaks
%RSD ≤ 30% for surrogates(tetrachloro-m-xylene and decachlorobiphenyl).

9.10 Has a calibration verification standard containing all analytes of interest been analyzed on each

YES NO N/A

working day, prior to sample analyses (pages 8081B-15, sections 7.5.2)? ☑ ☐ ☐

9.11 Has a calibration verification standard also been analyzed after every ~~10~~ samples and at the end of each analytical sequence (page 8081B-15, section 7.5.2)? 20 samples per method ☑ ☐ ☐

ACTION: If no, take action as specified in section 3.2 above.

9.12 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence (closing CCV). Has no more than 72 hours elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene CCV? ☑ ☐ ☐

ACTION: See Table 10 below.

9.13 Has the percent difference (%D) exceeded ± 20% for any organochlorine pesticide analyte in any calibration verification standard? ☐ ☐ ☐

9.14 Has a new 5 pt. calibration curve been generated for those analytes which failed in the calibration verification standard (page 8081B-16, section 7.5.2.2), and all samples which followed the out-of-control standard (page 8081B-16, section 7.5.2.3) reinjected? see Form 7s for any quals ☐ ☐ ☑

ACTION: If the %D for any analyte exceeded the ± 20% criterion and the instrument was not recalibrated for those analytes, see table below.

9.15 Have <u>daily</u> retention time windows been properly calculated for each analyte of interest (page 8081B-16, section 7.5.3)), using RTs from the associated mid concentration standard and standard deviation from the initial calibration)? per method ☑ ☐ ☐

7

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Instrument ID: SECD03 CalibrationDate: 02/23/11 Time: 0918

CCV ID: CCV953634 Lab File ID: PCCV1.D Init. Calib. Date Begin: 02/15/11 End: 02/15/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
alpha-BHC	20212.06	19251.175	4.8	AVRG
beta-BHC	7753.3706	7283.075	6.1	AVRG
delta-BHC	17810.738	16774.925	5.8	AVRG
gamma-BHC (Lindane)	17589.736	16840.25	4.3	AVRG
Heptachlor	17321.291	17037.15	1.6	AVRG
Aldrin	16134.245	16009.775	0.8	AVRG
Heptachlor epoxide	15607.071	14748.175	5.5	AVRG
Endosulfan I	15369.842	14797.25	3.7	AVRG
Dieldrin	15647.272	14941	4.5	AVRG
4,4'-DDE	15767.434	14515.2	7.9	AVRG
Endrin	13792.269	12653.7	8.3	AVRG
Endosulfan II	13556.138	12584.9	7.2	AVRG
4,4'-DDD	12724.532	11639.975	8.5	AVRG
Endosulfan sulfate	12049.956	10741.25	10.9	AVRG
4,4'-DDT	13475.465	12571.825	6.7	AVRG
Methoxychlor	5990.5629	5691.6	5.0	AVRG
Endrin aldehyde	11404.307	10259.95	10.0	AVRG
gamma-Chlordane	12444.4	15438.85	24.1	AVRG
alpha-Chlordane	15211.453	14779.925	2.8	AVRG
Endrin ketone	15637.093	14624.375	6.5	AVRG
==========				
2,4,5,6-tetrachloro-m-xylene(SURR)	11253.768	12600.075	12.0	AVRG
Decachlorobiphenyl(SURR)	13076.925	12770.7	2.3	AVRG

Average Used: 6.8

<- NQ - no samples associated

7

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Instrument ID: SECD03 CalibrationDate: 02/25/11 Time: 0921

CCV ID: CCV954394 Lab File ID: PCCV1.D Init. Calib. Date Begin: 02/15/11 End: 02/15/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
alpha-BHC	20212.06	20122.7	0.4	AVRG
beta-BHC	7753.3706	7279.675	6.1	AVRG
delta-BHC	17810.738	17627.95	1.0	AVRG
gamma-BHC (Lindane)	17589.736	17614.95	0.1	AVRG
Heptachlor	17321.291	17683.5	2.1	AVRG
Aldrin	16134.245	16372.275	1.5	AVRG
Heptachlor epoxide	15607.071	15086.125	3.3	AVRG
Endosulfan I	15369.842	14585.95	5.1	AVRG
Dieldrin	15647.272	15191.25	2.9	AVRG
4,4'-DDE	15767.434	14778.025	6.3	AVRG
Endrin	13792.269	13347.825	3.2	AVRG
Endosulfan II	13556.138	12833.7	5.3	AVRG
4,4'-DDD	12724.532	11781.15	7.4	AVRG
Endosulfan sulfate	12049.956	10988.275	8.8	AVRG
4,4'-DDT	13475.465	13069	3.0	AVRG
Methoxychlor	5990.5629	6125.55	2.3	AVRG
Endrin aldehyde	11404.307	10294.575	9.7	AVRG
gamma-Chlordane	12444.4	15589.75	25.3	AVRG
alpha-Chlordane	15211.453	14949.35	1.7	AVRG
Endrin ketone	15637.093	14535.175	7.0	AVRG
==========	==========	==========	==========	
2,4,5,6-tetrachloro-m-xylene(SURR)	11253.768	13246.075	17.7	AVRG
Decachlorobiphenyl(SURR)	13076.925	12186.175	6.8	AVRG

Average Used: 5.8

NO - increase in response - no + results.

SD002

7

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO11

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Instrument ID: SECD03 CalibrationDate: 02/25/11 Time: 1521

CCV ID: CCV954396 Lab File ID: PCCV2.D Init. Calib. Date Begin: 02/15/11 End: 02/15/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
alpha-BHC	20212.06	21676.95	7.2	AVRG
beta-BHC	7753.3706	7828.925	1.0	AVRG
delta-BHC	17810.738	19314.15	8.4	AVRG
gamma-BHC (Lindane)	17589.736	19227.825	9.3	AVRG
Heptachlor	17321.291	19217.825	10.9	AVRG
Aldrin	16134.245	17500.375	8.5	AVRG
Heptachlor epoxide	15607.071	16305.65	4.5	AVRG
Endosulfan I	15369.842	15298.9	0.5	AVRG
Dieldrin	15647.272	16468.2	5.2	AVRG
4,4'-DDE	15767.434	15841.975	0.5	AVRG
Endrin	13792.269	14753.4	7.0	AVRG
Endosulfan II	13556.138	13810.9	1.9	AVRG
4,4'-DDD	12724.532	12490.55	1.8	AVRG
Endosulfan sulfate	12049.956	12090.325	0.3	AVRG
4,4'-DDT	13475.465	13235.7	1.8	AVRG
Methoxychlor	5990.5629	6517.1	8.8	AVRG
Endrin aldehyde	11404.307	11209.575	1.7	AVRG
gamma-Chlordane	12444.4	16630.45	33.6	AVRG
alpha-Chlordane	15211.453	16014.225	5.3	AVRG
Endrin ketone	15637.093	15543.7	0.6	AVRG
==========				
2,4,5,6-tetrachloro-m-xylene(SURR)	11253.768	13485.325	19.8	AVRG
Decachlorobiphenyl(SURR)	13076.925	12849.675	1.7	AVRG

Average Used: 6.4

← NQ - increase in response - no + results

closer - SD002

180311 1922

FORM VII

Initial Calibration Date: 2/15/11, Instrument SECD03 - Column 1
RRF and %RSD Calculations:

Compound Name: alpha-BHC in level 3
Lab Value: 19045.7000

Area of Compound	190457
Conc. of Compound	10
Calculated CF	19045.700

Compound Name: alpha-BHC
Lab Value: 8.3

CF of STD 1	17263.000
CF of STD 2	18994.200
CF of STD 3	19045.700
CF of STD 4	20705.325
CF of STD 5	20526.900
CF of STD 6	22417.375
CF of STD 7	21183.580
CF of STD 8	21560.400
Calculated % RSD	8.26

Continuing Calibration File ID: 2/23/2011 @ 1800, file ID PCCV2.D
RRF and %D Calculations:

Compound Name: methoxychlor
Lab Value: 5124.5750

Area of Compound	204983
Conc. of Compound	40
Calculated CF	5124.575

Compound Name: methoxychlor
Lab Value: 14.5

Average CF	5990.563
CF of CCV	5124.575
Calculated % D	14.5

YES NO N/A

ACTION: If no, take action specified in section 3.2 above or recalculate RT windows using the procedure outlined in method 8081B-16, section 7.5.3.

9.16 Do all standard retention times for each mid concentration standard fall within the windows established during the initial calibration sequence? ✓ ___ ✓

9.17 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows (page 8081B-16, section 7.5.3)? ✓ ___ ___

ACTION: If the answer to either 9.15 or 9.16 above is no, check the chromatograms of all samples which followed the last in-control standard. All samples analyzed after the last in-control standard must be re-injected, if initial analysis indicated the presence of the specific analyte that exceeded the retention time criteria (page 8081B-18, section 7.5.7.). If samples were not re-analyzed, document under Contract Non-compliance in the Data Assessment.

Reviewer has two options to determine how to qualify questionable sample data. First option is to determine if possible peaks are present within daily retention time window. If no possible peaks are found, non-detects are valid. If possible peaks are found (or interference), qualify positive hits as presumptively present "NJ" and non-detects are rejected "R". Second option is to use the ratio of the retention time of the analyte over the retention time of either surrogate. The passing criteria is ± 0.06 RRT units of the RRT of the standard component. Reject "R" all questionable analytes exceeding criteria, and "NJ" all other positive hits.

For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use option 2 specified in paragraph above.

YES NO N/A

See Table 10 below.

Table 10. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RT out of RT window	Use professional judgement	
%D not within +/- 20%	J	UJ
Time elapsed greater than section 9.12 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.18 Are there any transcription/calculation errors between raw data and data summary forms? ___ [4] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [4] ___ ___

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [4] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it

YES NO N/A

accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

11.0 Extraction Method Cleanup Efficiency Verification (Form IX/Equivalent)

11.1 Method 8081B permits a variety of extraction techniques to be used for sample preparation. Which extraction procedure was used?

1. Aqueous samples:

1. Separatory funnel (Method 3510) ✓

2. Continuous liquid-liquid extraction (Method 3520) _____

3. Solid phase extraction (Method 3535) _____

4. Other _____

2. Solid samples:

1. Soxhlet (Method 3540) _____

2. Automated Soxhlet (Method 3541) _____

3. Pressurized fluid (Method 3545) _____

4. Microwave extraction (Method 3546) _____

5. Ultrasonic extraction (Method 3550) _____

6. Supercritical fluid (Method 3562) _____

7. Other _____

11.2 Is Form IX - Pest-1/Equivalent present and complete for each lot of Florisil/Cartridges used? (Florisil Cleanup, Method 3620A, is required for all organochlorine pesticide extracts.) [ ] ___ ___ ✓

lab did not perform florisil
lab SOP used

YES NO N/A

ACTION: If no, take action specified in 3.2 above. If data suggests that florisil cleanup was not performed, make note in the reviewer narrative.

NOTE: Method 3620A uses Florisil, while the SOW/CLP allows for Florisil cartridges. Method 3620A does not list which pesticides and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct pesticide list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.3 Are all samples listed on modified CLP Pesticide Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.4 If GPC Cleanup was performed, is Form IX - Pest-2/ Equivalent present? [ ] ___ ✓

ACTION: If GPC was not performed and sample results indicate significant sulfur interference, make note in the data assessment.

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.5 Were the same compounds on Form IX used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.6 Are percent recoveries (% R) of the pesticide and surrogate compounds used to check the efficiency of the cleanup procedures within QC limits listed on Form IX:

80-120% for florisil cartridge check? [ ] ___ ✓

80-110% for GPC calibration? [ ] ___ ✓

YES NO N/A

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 80%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for pesticide compounds. Qualify positive results "J" (estimated).

NOTE: If 2,4,5-trichlorophenol was used to measure the efficiency of the Florisil cleanup and the recovery was > 5%, sample data should be evaluated for potential interferences.

12.0 Pesticide Identification

12.1 Has CLP Form X, showing retention time data for positive results on the two GC columns, been completed for every sample in which a pesticide was detected? ☑ ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and Florisil cleanup verification forms)? ___ ☑ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both analyses? ☑ ___ ___

Note: Confirmation can be supported by other qualitative techniques such as GC/MS (Method 8270), or GC/AED (Method 8085) if sensitivity permits.

287

YES NO N/A

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently (see section 9.7 above). Also check for false negatives among the multiple peak compounds toxaphene and chlordane. Were there any false negatives? ___ [L] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation used as the second column Confirmation? (This is not required). [ ] ___ ___ ✓

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%~~? < 40% (per method) [ ] ✓ ___

see Form 10's for flags

NOTE: The method 8081B requires quantitation from one column. The second column is to confirm the presence of an analyte. Calibration for the Confirmation column is a one point calibration. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

10

PESTICIDE ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.: VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Lab Sample ID: 350200405 Date(s) Analyzed: 02/22/11 02/22/11

Instrumet ID (1): SECD03 Instrumet ID (2): SECD03

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D	
beta-BHC	*	1	4.068	4.068	0.000	18916	2.4	0.025		
		2	4.112	4.111	0.001	13273	1.1	0.011	77.78	J
delta-BHC	*	1	4.273	4.272	0.001	20506	1.2	0.012		
		2	4.429	4.431	0.002	26126	0.97	0.01	18.18	
gamma-BHC (Lindane)	*	1	3.982	3.976	0.006	5516	0.31	0.0032		
		2	4.029	4.023	0.006	38187	1.3	0.014	125.58	U@LOD
Heptachlor	*	1	4.512	4.515	0.003	12368	0.71	0.0074		
		2	4.501	4.508	0.007	12397	0.46	0.0048	42.62	J
Aldrin	*	1	4.860	4.860	0.000	7156	0.44	0.0046		
		2	4.875	4.868	0.007	25647	0.96	0.01	73.97	NJ
Heptachlor epoxide	*	1	5.555	5.556	0.001	56568	3.6	0.038		
		2	5.508	5.511	0.003	103242	4.2	0.043	12.35	
Endosulfan I	*	1	6.054	6.058	0.004	72111	4.7	0.049		
		2	5.996	5.999	0.003	134366	5.9	0.061	21.82	
Dieldrin	*	1	6.366	6.370	0.004	74199	4.7	0.049		
		2	6.351	6.355	0.004	155283	6.3	0.066	29.57	
4,4'-DDE	*	1	5.929	5.931	0.002	105814	6.7	0.07		
		2	6.092	6.096	0.004	219780	8.9	0.092	27.16	
Endrin	*	1	6.690	6.696	0.006	73559	5.3	0.055		
		2	6.774	6.781	0.007	158784	7.3	0.075	30.77	
Endosulfan II	*	1	7.009	7.015	0.006	52453	3.9	0.04		
		2	7.076	7.081	0.005	107770	4.9	0.051	24.18	
4,4'-DDD	*	1	6.725	6.730	0.005	61044	4.8	0.05		
		2	6.883	6.887	0.004	130275	6.3	0.065	26.09	
Endosulfan sulfate	*	1	8.360	8.370	0.010	29872	2.5	0.026		
		2	8.037	8.044	0.007	55438	2.9	0.03	14.29	
4,4'-DDT	*	1	7.136	7.141	0.005	112461	8.3	0.086		
		2	7.357	7.363	0.006	185043	9.5	0.098	13.04	
Methoxychlor	*	1	7.869	7.874	0.005	36466	6.1	0.063		
		2	8.497	8.503	0.006	66057	6.7	0.069	9.09	
Endrin aldehyde	*	1	7.636	7.645	0.009	5827	0.51	0.0053		
		2	7.585	7.591	0.006	15661	0.84	0.0087	48.57	J
gamma-Chlordane	*	1	5.701	5.707	0.006	31377	2.5	0.026		
		2	5.735	5.738	0.003	125880	4.9	0.051	64.94	J

10

PESTICIDE ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06 VWW06-SW018-0211

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Lab Sample ID: 350200405 Date(s) Analyzed: 02/22/11 02/22/11

Instrumet ID (1): SECD03 Instrumet ID (2): SECD03

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

alpha-Chlordane	*	1	5.870	5.873	0.003	66626	4.4	0.045	
		2	5.912	5.916	0.004	158527	6.4	0.066	37.84
Endrin ketone	*	1	8.869	8.877	0.008	43619	2.8	0.029	
		2	9.005	9.014	0.009	81319	3.3	0.034	15.87
Tetrachloro-m-xylene	*	1	2.848	2.839	0.009	866545	77	0.8	
		2	2.801	2.792	0.009	1709058	84	0.88	9.52
Decachlorobiphenyl	*	1	10.827	10.837	0.010	977974	75	0.77	
		2	11.402	11.408	0.006	1555084	82	0.85	9.88

* Column used for quantitation

10

PESTICIDE ORGANIC DUAL COLUMN CONFIRMATION CHECK

EPA Sample No.

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.SW.06 VWW06-SD002-0211

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Lab Sample ID: 350200417 Date(s) Analyzed: 02/25/11 02/25/11

Instrumet ID (1): SECD03 Instrumet ID (2): SECD03

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

COMPOUND		COL	RT	EXP RT	DIFF	AREA	AMOUNT	CONC	%D
4,4'-DDE	*	1	5.924	5.931	0.007	17764	1.1	1.1	
		2	6.083	6.096	0.013	44861	1.8	1.7	42.86
4,4'-DDD	*	1	6.716	6.730	0.014	19948	1.6	1.5	
		2	6.873	6.887	0.014	30135	1.4	1.4	6.90
2,4,5,6-tetrachloro-m-xylene	*	1	2.825	2.839	0.014	977983	87	83.8	
		2	2.778	2.792	0.014	1794488	89	85.5	2.01
Decachlorobiphenyl	*	1	10.816	10.837	0.021	928564	71	68.5	
		2	11.393	11.408	0.015	1406771	74	71.7	4.56

J

* Column used for quantitation

YES NO N/A

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier
0-25%	none
~~26~~ 40-70% (per method SAP)	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected) "NJ"	
>50% (Pesticide vale is ~~<CRQL~~ LOD per SAP)	"U"
>201%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that the higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ [V] ___

NOTE: Single-peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

SAMPLE CALCULATION

Sample ID: VWW6-SD014-0211
Standard ID: ICAL 2/15/11
Compound: 4,4'-DDE
Concentration: 1.3 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		11947
CF of Compound		15767.43375
Final Volume		10
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	33.1
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.18
Concentration	#DIV/0!	1.27174

Jacqueline Cleveland

From: Michael.Zamboni@CH2M.com
Sent: Tuesday, April 19, 2011 2:00 PM
To: cleve137@charter.net
Subject: RE: Vieques SWMU6 Pesticide Calculation Issue

Jackie, do you need assistance making these manual changes to the SNEDD? If so, please give me a call so we can coordinate version control of the excel file.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Tuesday, April 19, 2011 2:55 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Zamboni, Michael/WDC; Brynildsen, Victoria/VBO
Subject: RE: Vieques SWMU6 Pesticide Calculation Issue

Good afternoon.

Corrective action report attached for the 8081 on SDG 3502004. This will be included in the revised report.

The 8081 data has been reloaded into our LIMs and re-calculated. The 8081 section of the report and raw data will be revised.

Please note the following that will appear in the revised 8081 case narrative:

A. Samples:

Sample analysis proceeded normally.
The following sample(s) had concentration changes between the last report and the final report. There was an error in the adjustment for initial volume. All changes are summarized below.

VWW06-SW023P-0211, Decachlorobiphenyl old value: 0.79 = UG/L new value: 0.82 = UG/L
VWW06-SW023P-0211, Tetrachloro-m-xylene old value: 0.61 = UG/L new value: 0.63 = UG/L
VWW06-SW023-0211, Decachlorobiphenyl old value: 0.83 = UG/L new value: 0.87 = UG/L
VWW06-SW023-0211, Tetrachloro-m-xylene old value: 0.61 = UG/L new value: 0.64 = UG/L
VWW06-SW022-0211, Decachlorobiphenyl old value: 0.84 = UG/L new value: 0.86 = UG/L
VWW06-SW022-0211, Tetrachloro-m-xylene old value: 0.93 = UG/L new value: 0.96 = UG/L
VWW06-SW021-0211, Decachlorobiphenyl old value: 0.82 = UG/L new value: 0.86 = UG/L
VWW06-SW021-0211, Tetrachloro-m-xylene old value: 0.86 = UG/L new value: 0.9 = UG/L
VWW06-SW018-0211, 4,4'-DDD old value: 0.048 J UG/L new value: 0.05 J UG/L
VWW06-SW018-0211, 4,4'-DDE old value: 0.067 = UG/L new value: 0.07 = UG/L
VWW06-SW018-0211, 4,4'-DDT old value: 0.083 = UG/L new value: 0.086 = UG/L
VWW06-SW018-0211, Aldrin old value: 0.0044 JP UG/L new value: 0.0046 JP UG/L
VWW06-SW018-0211, alpha-Chlordane old value: 0.044 J UG/L new value: 0.045 J UG/L
VWW06-SW018-0211, beta-BHC old value: 0.024 JP UG/L new value: 0.025 JP UG/L
VWW06-SW018-0211, Decachlorobiphenyl old value: 0.75 = UG/L new value: 0.77 = UG/L
VWW06-SW018-0211, Dieldrin old value: 0.047 J UG/L new value: 0.049 J UG/L
VWW06-SW018-0211, Endosulfan I old value: 0.047 J UG/L new value: 0.049 J UG/L
VWW06-SW018-0211, Endosulfan II old value: 0.039 J UG/L new value: 0.04 J UG/L
VWW06-SW018-0211, Endosulfan sulfate old value: 0.025 J UG/L new value: 0.026 J UG/L
VWW06-SW018-0211, Endrin old value: 0.053 = UG/L new value: 0.055 = UG/L
VWW06-SW018-0211, Endrin aldehyde old value: 0.0051 JP UG/L new value: 0.0053 JP UG/L
VWW06-SW018-0211, Endrin ketone old value: 0.028 J UG/L new value: 0.029 J UG/L
VWW06-SW018-0211, gamma-BHC (Lindane) old value: 0.0031 JP UG/L new value: 0.0032 JP UG/L

VWW06-SW018-0211, gamma-Chlordane old value: 0.025 JP UG/L new value: 0.026 JP UG/L
VWW06-SW018-0211, Heptachlor old value: 0.0071 JP UG/L new value: 0.0074 JP UG/L
VWW06-SW018-0211, Heptachlor epoxide old value: 0.036 J UG/L new value: 0.038 J UG/L
VWW06-SW018-0211, Methoxychlor old value: 0.061 = UG/L new value: 0.063 = UG/L
VWW06-SW018-0211, Tetrachloro-m-xylene old value: 0.77 = UG/L new value: 0.8 = UG/L
VWW06-SW019-0211, Decachlorobiphenyl old value: 0.66 = UG/L new value: 0.68 = UG/L
VWW06-SW019-0211, Tetrachloro-m-xylene old value: 0.61 = UG/L new value: 0.63 = UG/L
VWW06-SW020-0211, Decachlorobiphenyl old value: 0.78 = UG/L new value: 0.8 = UG/L
VWW06-SW020-0211, Tetrachloro-m-xylene old value: 0.86 = UG/L new value: 0.89 = UG/L
VWW06-EB01-020811, Decachlorobiphenyl old value: 0.95 = UG/L new value: 0.98 = UG/L
VWW06-EB01-020811, Tetrachloro-m-xylene old value: 0.97 = UG/L new value: 1 = UG/L

I will have the revised pdf and revised EDD posted online later today.

Please contact me with any questions or concerns.

Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Sunday, April 17, 2011 4:05 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: Vieques SWMU6 Pesticide Calculation Issue
Importance: High

Hello John,

Good Morning!

Another issue has come up during the calculation verification portion of my data review. This issue is in **SDG 3502004** in the pesticides calculation of results for the water samples. Please see the example below:

Sample ID VWW6-SW018-0211 – compound dieldrin, reported concentration – 0.047J ug/L

My calculation is as follows – ((74199)(10)(1))/((15647.27198)(965)) = 0.049 ug/L

It appears that the positive results reported in this SDG for the water samples were calculated using a FV of 1000ml regardless of the actual FV. I have attached a pdf of the form 1 and quant page for this sample to illustrate the issue for the reported positive results as well as for another sample showing the surrogates only. This seems to hold true for all reported positive results in this water sample as well as surrogate concentrations in all of the water samples. The reported MDLs, LODs and LOQs presented on the Form 1s seem to have been correctly calculated. This is the only SDG in which this error was found. Please let me know if I am missing something but it appears that something in the automatic system defaulted to a FV of 1000 for the water sample quantitation calculations. The soil results presented in the package were calculated correctly. I will need resubmitted forms 1 & 10 for the sample noted here as well as a corrected Form 2 and form 10s (for surrogate results) for the water samples if you find that I am correct in my assessment.

Again, please don't hesitate to contact me if you have any questions regarding this request! I believe there are now four outstanding issues. Please let me know when I can expect response as these DV reports are due to CH2M HILL early this week! Thank you so much for your help.

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

A. CORRECTIVE ACTION REPORT ID: CAR00549

Name of Originator: **Mark Barnard**

1. BACKGROUND INFORMATION

SECTION: **SVOA**

Date: April 18, 2011	Project: 3502004
Batch: 3873	Methods: 8081
Samples: All	

2. DESCRIPTION OF PROBLEM:

The positive results reported in this SDG for the water samples were calculated using a FV of 1000mL regardless of the actual FV noted on the Extraction Log. This is true for all reported positive results in this water sample as well as surrogate concentrations in all of the water samples. Investigation found that the volumes were updated in the target raw data but the data was not reprocessed to correct the results reported from target.

3. RECOMMENDED ACTION:

Data will be re-quantified correctly, reported and re-submitted to the client. Procedures will be reviewed to ensure data is being reviewed accurately.

4. CLIENT NOTIFICATION (if applicable)

PEL employee contacting the client: John Heyman Date Notified: 04/17/2011

Person Contacted: J. Cleveland

Client's Comments:

Client sent the following e-mail to John Heyman on 4/17/2011:
SDG 3502004 in the pesticides calculation of results for the water samples. Please see the example below:

Sample ID VWW6-SW018-0211 – compound Dieldrin, reported concentration – 0.047Jµg/L

My calculation is as follows – ((74199)(10)(1))/((15647.27198)(965)) = 0.049µg/L

It appears that the positive results reported in this SDG for the water samples were calculated using a FV of 1000mL regardless of the actual FV. I have attached a pdf of the form 1 and quant page for this sample to illustrate the issue for the reported positive results as well as for another sample showing the surrogates only. This seems to hold true for all reported positive results in this water sample as well as surrogate concentrations in all of the water samples. The reported MDLs, LODs and LOQs presented on the Form 1s seem to have been correctly calculated. This is the only SDG in which this error was found. Please let me know if I am missing something but it appears that something in the automatic system defaulted to a FV of 1000 for the water sample quantification calculations. The soil results presented in the package were calculated correctly. I will need resubmitted forms 1 & 10 for the sample noted here as well as a corrected Form 2 and form 10s (for surrogate results) for the water samples if you find that I am correct in my assessment.

CAR00549 Continued

5. Send Copies To:

X	**QAO**	
X	**Lab Director**	
X	**Project Managers**	
X	**Section Leaders**	
	Sections involved:	
	Log-In	
	Prep	
	SemiVols	X
	Vols	
	Inorganic	

X **QAO Approval:** Mark-Allen W. Barnard

Digitally signed by Mark-Allen W. Barnard
DN: CN = Mark-Allen W. Barnard, C = US, O = a Division of Spectrum Analytical, featuring Hanibal Technology, OU = PEL
Reason: I am approving this document
Date: 2011.04.18 16:44:52 -04'00'

SAMPLE CALCULATION

Sample ID: VWW6-SW018-0211
Standard ID: ICAL 2/15/11
Compound: dieldrin
Concentration: 0.047J ug/L

	Water (ug/L)	Soil (ug/Kg)
Area of Compound	74199	
CF of Compound	15647.27198	
Final Volume	10	
Dilution Factor	1	
Split Factor	1	
Injection Volume	1	
Weight of Sample	na	
Initial Volume of Sample	965	NA
Conversion Factor	1	
Percent Solids Factor	1	
Concentration	0.04914	#DIV/0!

correct value
lab made corrections & resubmitted Form I — received 4/19/11

YES NO N/A

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? [Y] ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? [Y] ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ [Y] ___

ACTION: Note all system performance problems in the data assessment.

some baseline disturbance early in run - accounted for in MI.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for organochlorine pesticide analysis? [Y] ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

SW023/SW023P Not

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made to determine the proper identification of field duplicates.

Yes NO N/A

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 3502004

LAB: PEL SITE: Viegues SWMU6

1.0 Data Completeness and Deliverables

1.1 Has all the data been submitted in CLP deliverable format? [✓] ___ ___

1.2 Have any missing deliverables been received and added to the data package? [ ] ___ ✓

resubs/corrections received

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? [✓] ___ ___

2.2 Are the case number and/or SDG number contained in the narrative or cover letter? [✓] ___ ___

3.0 Data Validation Checklist

3.1 Does this data package contain:

Water data? ✓ ___

Waste data? ___ ✓

Soil/solid data? ✓ ___

POLYCHLORINATED BIPHENYLS

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? [✓] ___ ___

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8082 for Aroclor analysis.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8082 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

PCB 1016 and PCB 1260 were used as the spiking solution for all QC spikes.

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

E. Internal Standards:

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

This method does not require the use of internal standards.

F. Samples:

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.
Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:
Name: Brian C. Spaan Title: Lab Director

SIGNED: **DATE:** **03/01/2011**

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8082 for Aroclor analysis.

IV. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8082 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

PCB 1016 and PCB 1260 were used as the spiking solution for all QC spikes.

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SS012-0211MS was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered above criteria: Aroclor-1260 at 133 % with criteria of (60-130).

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

Samples coded accordingly.

E. Internal Standards:

This method does not require the use of internal standards.

F. Samples:

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signature:

Name: Brian C. Spanfr **Title:** Lab Director

SIGNED: **DATE:**
03/18/2011

Yes NO N/A

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ✓ [ ]

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, non detects shall be qualified as unusable, "R."

all SD <50% Soil. J/UJ

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any PCB technical holding times, determined from date of collection to date of extraction, been exceeded? [ ] ✓

Water and waste samples for PCB analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction. Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

ACTION: If technical holding times are exceeded, flag all positive results as estimated, "J," and sample quantitation limits "UJ" and document in the narrative that holding times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all the data should at least be

307

Yes NO N/A

qualified "J", but the reviewer may determine that non-detects are unusable,"R." (Table 1)

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days(extraction) ≤ 40 days(analysis)	J*	UJ*
	No	> 7 days(extraction) > 40 days(analysis)	J	UJ
	Yes	≤ 7 days(extraction) ≤ 40 days(analysis)	No qualification	
	Yes	> 7 days(extraction) > 40 days(analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days(extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days(extraction) >40 days(analysis)	J	UJ
	Yes	≤ 14days(extraction) ≤ 40 days(analysis)	No qualification	
	Yes	> 14days(extraction) > 40 days(analysis)	J	UJ
	Yes/No	> 28 days(gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [Y] ___ ___

Yes NO N/A

b. Soil/Solid [Y] ___ ___

3.2 Are all the PCB samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [Y] ___ ___

b. Waste [ ] ___ Y

c. Soil/Solid [Y] ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ per lab SOP limits for all samples, including MS and MSDs, LCSs and all blanks? [Y] ___ ___

Note: Reviewer shall use lab in-house recovery limits, if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate criteria, Table 2.

Note: DCB is used when PCBs are determined as Aroclors. DCB is the internal standard when determining PCB congeners and TCMX the surrogate.

3.4 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [Y] ___ ___

ACTION: Follow surrogate criteria, Table 2.

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement

Yes NO N/A

150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample (LCS)

4.1 Are raw data and percent recoveries present for all Laboratory Control samples as required by Method 8000B (section 8.5) and Method 8082A (section 8.4.2)? [ ] ___ ___

Verify that QC check samples were extracted and analyzed by the same procedures used for the actual samples.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation/ resubmittals. Make note in the data assessment.

NOTE: For aqueous samples, an additional QC check sample must be prepared and analyzed when any analyte in a matrix spike fails the required acceptance criteria (see section 5.3 below).

310

Yes NO N/A

The additional QC check sample must contain each analyte that failed in the MS analysis.

Note: When the results for matrix spike analysis indicates a problem due to sample matrix effects, the LCS results are used to verify the laboratory can perform the analysis in a clean sample.

4.2 Were Laboratory Control Samples analyzed at the required concentration as specified in Method 8000B(sec 8.5) for all analytes as specified ~~in Table 3~~. lab SOP/client SAP ☑ ___ ___

Note: Use lab in-house criteria, if available.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Were the LCS recoveries within the percent recoveries ~~as~~ specified in ~~Table 3.~~ lab SOP/client SAP ☑ ___ ___

Table 3. LCS Criteria

Compound	% Recovery
Aroclor 1016	50-150
Aroclor 1260	50-150
Tetrachloro-m-xylene (surrogate)	30-150
decachlorobiphenyl (surrogate)	30-150

4.4 If no, were Laboratory Control Samples re-analyzed? ☐ ___ ☑

ACTION: If QC check samples were not re-analyzed, or a general system problem is indicated by repeated failure to meet the QC acceptance criteria specified in the method, make note in the data assessment and use Table 4 recovery actions criteria.

Yes NO N/A

Table 4. LCS Recovery Actions

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Lower Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for one matrix spike and matrix duplicate (unspiked) pair (MS/Dup) or matrix spike/matric spike duplicate (MS/MSD)present and complete for each matrix (Method 8082A Section 8.4.1)? [ ] ✓ ___ ___

NOTE: For soil and waste samples showing detectable amounts of target analytes, the lab may substitute replicate samples in place of the matrix spike (see Method 8000B-40, section 8.5.3).

yes for soil
no for H2O

5.2 Have MS/Dup or MS/MSD results been summarized on modified CLP Form III? [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/Dup, MS/MSD must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month (Method 8000B-39 (section 8.5)).

a. Water [✓] ___ ___

SLC

	Yes	NO	N/A
b. Waste	[ ]	___	✓
c. Soil/Solid	[✓]	___	___

ACTION: If any MS/Dup or MS/MSD data are missing, take the action specified in 3.2 above.

5.4 Were ~~Laboratory Control Samples~~ MS/MSD analyzed for all analytes as specified in Table 5, or did the lab use ~~the optional~~ QC acceptance criteria i.e., in-house criteria? [✓] ___ ___

List the criteria used and make note in data assessment.

Criteria used 1016 - 40-140 } soils
1260 - 60-130 }

Table 5. MS/MSD Criteria

Compound	Percent Recovery QC Limits	RPD
Aroclor 1016	29-135	0-15
Aroclor 1260	29-135	0-20

5.5 Was the matrix spike prepared at the proper spike concentration? (Method 8000B, section 8.5.1-8.5.2) per lab SOP [✓] ___ ___

For aqueous organic extractable, the spike concentration should be prepared according options in: Method 8000B-40, (section 8.5.1 and 8.5.2). lab criteria used

5.6 Were the matrix spike and matrix spike duplicate recovery and RPD limits met as specified in Table 5. Note: No qualification of the data is necessary on MS and MSD data alone. Use professional judgement to use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If any MS and MSD, percent recovery, or RPD results in the Arcolor fraction is out of specification (Table 5), qualify data to include the consideration of the existence interference in the raw data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples. Use professional judgement to determine the need for qualifications of detects of non-spiked compounds.

3

PCB ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

VWW06-SS012-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/4022

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC.
Aroclor-1016	360	0	400	111.0	40 - 140
Aroclor-1260	360	0	480	133.0 *	60 - 130

Spike Recovery: 1 out of 2 outside limits

NQ- MSD OK

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

Form III

180311 1923

PCB ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/4 | VWW06-SS012-0211SD

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502004

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Aroclor-1016	360	420	116.0	2.9	30	40 - 140
Aroclor-1260	360	440	122.0	8.1	30	60 - 130

RPD: 0 out of 2 outside limits

Spike Recovery: 0 out of 2 outside limits

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

_____

Form III

160311 1923

Yes NO N/A

[ ] ✓ ___

MS slightly ↓ MSD OK J- NQ

Table 6. MS/MSD Actions for Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on CLP equivalent Method Blank Summary form(s) (Form IV)? ✓ ___ ___

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ✓ ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any time during the analytical shift.

ACTION: If any blank data are missing, take action as specified above (section 3.2) . If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system

Yes NO N/A

printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for PCBs? ✓ ___ ___

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ ✓ ___

7.2 Do any field/rinse blanks have positive PCB results? ___ ✓ ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 7 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 7. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples

Yes NO N/A

Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying for calibration criteria.

Note: When applied as described in Table 7 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? N/A

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

Yes NO N/A

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic capillary column used for the analysis of PCBs? [✓] ___ ___

Action: Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (Method 8082, section 4.2)

8.2 Indicate the specific type of narrow bore or wide bore (.53 mm ID, fused silica GC columns, such as DB-608 and DB-1701 or equivalent).

column 1: STX-CLP1

column 2: STX-CLP2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. Samples [ ] ___ ___

b. All blanks [ ] ___ ___

c. Matrix spike samples [ ] ___ ___

d. 5 pt. initial calibration standards [ ] ___ ___

e. calibration verification standards [ ] ___ ___

f. Laboratory Control samples (LCS) [ ] ___ ___

ACTION: If no, take action specified in 3.2 above.

9.2 Are data summary forms (containing calibration factors or response factors) for the initial 5

315

Yes NO N/A

pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? ✓ ___ ___

Note: Calibration Aroclor mixtures other than 1016/1260 may be used (as per approved project QA plan)

NOTE: If internal standard calibration procedure is used (Method 8000B-15(section 7.4.2.2)), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (Method 8000B-16 (section 7.4.2.1)), then calibration factors must be used. The internal standard approach is highly recommended for PCB congener analysis.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.3 Are there any transcription/calculation errors between raw data and data summary forms? ___ ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.4 Are standard retention time (RT) windows for each PCB peak of interest presented on modified CLP summary forms? ✓ ___ ___

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all PCBs are established using retention times from three calibration standards analyzed during the entire analytical sequence (Method 8000B, section 7.6). Best results are obtained

Yes NO N/A

using retention times which span the entire sequence; i.e., using the calibration verification/continuing calibration standards analyzed every 12 hours.

9.5 Were RT windows on the confirmation column established ~~using three standards~~ per lab SOP as described above? ✓ ___ ___

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.4 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.6 Do all standard retention times in each level of the initial 5 pt. calibrations for PCBs fall within the windows established during the initial calibration sequence? ✓ ___ ___

ACTION i: If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standard spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows may be too tight. If so, RT windows should be recalculated as per Method 8081B-15 (section 7.4.6).

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

9.7 Has the linearity criteria for the initial calibration standards been satisfied for both

321

Yes NO N/A

columns? (% RSD for the calibration factors (CFs) for the three to five major peaks of each of the Aroclor compounds must be < 20.0%). ✓ ___ ___

ACTION: If no, follow Table 8 criteria.

Table 8. Initial Calibration CF Action for Aroclor Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD > 20%	J	UJ
% RSD within allowable limits	No qualifications	

9.8 Does the calibration verification/continuing calibration standard contain the PCB peaks of interest, analyzed on each working day, prior to sample analyses (Method 8082, sections 7.6.2)? ✓ ___ ___

9.9 Has a calibration verification/continuing calibration standard been analyzed after every ~~10~~ samples and at the end of each analytical sequence (Method 8082A, section 7.6.2). 20 per method ✓ ___ ___

ACTION: If no, take action as specified in section 3.2 above.

9.10 Has the percent difference (%D) between the Calibration Factor (CF) of each of the three to five peaks used to identify the Aroclor in the CCV and the CF from these peaks in the initial calibration exceeded ~~± 15%~~. +/-20% per method ___ ✓ ___

9.11 Has a new 5 pt. initial calibration curve been generated for those PCB analytes which failed in the calibration verification/continuing calibration standard (8000B, section 7.7.3), and all samples which followed the out-of-control

322

Yes NO N/A

calibration verification/standard continuing calibration Standard? [ ] ___ ___ ✓

ACTION: If the %D for any analyte exceeded the ± 15% criterion and the instrument was not recalibrated for those analytes, qualify positive results for all associated samples (those which followed the out-of-control standard) "J" and sample quantitation limits "UJ". (see Table 9)

9.12 Have retention time (RT) windows been properly calculated for each analyte of interest (Method 8000B, section 7.6), using RTs from the associated calibration verification/continuing standard? per lab SOP [✓] ___ ___

ACTION: If no, take action specified in section 3.2 above

9.13 Do all standard retention times for each calibration verification/continuing calibration standard fall within the windows established during the initial calibration sequence? [✓] ___ ___ ✓

9.14 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows. ✓ [ ] ___ ___

ACTION: For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use paragraph B below. If the answer to either 9.13 or 9.14 above is no, check the chromatograms of all samples which followed the last in-control standard. If samples were not re-analyzed, all samples analyzed after the last in-control standard must be evaluated using professional judgement.

(A) For non-detected target compounds, check to see if the sample chromatograms contain any peaks that are close to the expected RT window of the Arcolor of interest. If no peaks are present, no qualification of data is necessary. If peaks are present close th RT window of the Aroclor of interest, qualify the non-detected values as presumptively present "N".

Initial Calibration Date: 2/10/11-2/13/11, on STX-CLP1
RRF and %RSD Calculations:

Compound Name: AR1260 peak 2 in level 2
Lab Value: 8834600.0000

Area of Compound	176692
Conc. of Compound	0.02
Calculated CF	8834600.000

Compound Name: AR1260 Peak 2
Lab Value: 10.2

CF of STD 1	9755833.333
CF of STD 2	8834600.000
CF of STD 3	8231710.000
CF of STD 4	7482520.000
CF of STD 5	7794005.000
CF of STD 6	7773178.000
CF of STD 7	
CF of STD 8	
Calculated % RSD	10.22

Continuing Calibration File ID: 2/12/11, 0324, STX-CLP1
RRF and %D Calculations:

Compound Name: AR1260, peak 1
Lab Value: 5422270.0000

Area of Compound	542227
Conc. of Compound	0.1
Calculated CF	5422270.000

Compound Name: AR1260, peak 1
Lab Value: 13.1

Average CF	4793066.100
CF of CCV	5422270
Calculated % D	-13.1

Yes NO N/A

(B) For detected compounds in the affected samples, if peaks within the RT window, no qualification necessary. If peaks are close to the expected RT window of the Aroclor of interest, the reviewer can examine the data package for the presence of three or more standards the Aroclor of interest that were run within the analytical sequence during which the sample was analyzed. If three or more such standards are present, the RT window can be reevaluated using the Mean Retention Times of the standards. If the peaks in the affectd sample fall within the revised window, qualify the detected target compounds "NJ". If the reviewer cannot do anything with the data to resolve the problem of concern, qualify all non-detects as unusable "R". (Table 9)

9.15 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence sequence (closing CCV). (Table 9) ☑ ___ ___

Table 9. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	**Non-Detected Associated Compounds**
RT out of RT window	Use professional judgement (Sec 9.14)	
%D not within +/- 15%	J	UJ
Time elapsed greater than section 9.15 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.16 Are there any transcription/calculation errors between raw data and data summary forms? ___ ☑ ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? ☑ ___ ___

Yes NO N/A

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

10.3 Were the TCMX/DCB surrogate RTs for the samples within the mean surrogate RT from the initial calibration? [✓] ___ ___

Action: If no, see "Action" in section 9.14 above

11.0 Extraction Techniques for Sample Preparation

Method 8082A permits a variety of extraction techniques to be used for sample preparation. Check which extraction procedure was used?

1. Aqueous samples:

    1. Separatory funnel (Method 3510) [✓] ___ ___
    2. Continuous liquid-liquid extraction (Method 3520) [ ] ___ ___
    3. Solid phase extraction (Method 3535) [ ] ___ ___
    4. Other [ ] ___ ___

2. Solid samples:

    1. Soxhlet (Method 3540) [ ] ___ ___
    2. Automated Soxhlet (Method 3541) [ ] ___ ___
    3. Pressurized fluid (Method 3545) [ ] ___ ___
    4. Microwave extraction (Method 3546) [ ] ___ ___
    5. Ultrasonic extraction (Method 3550) [✓] ___ ___

Yes NO N/A

6. Supercritical fluid (Method 3562) [ ] ___ ___

7. Other [ ] ___ ___

11.1 Extract Cleanup - Efficiency Verification (Form IX/Equivalent)

11.1.1 Method 8082 (section 7.2) references method 3660 (sulfur) and 3665A (sulfuric acid) to use for cleaning extracts. Were one or both method used? [✓] [✓] ___ JAC 4/19/11

ACTION: If no, take action specified in 3.2 above. If data suggests cleanup was not performed, make note in the data assessment. Acid clean-up was performed Cu only per lab

NOTE: Method 3620A, Florisil, may be used per approved project QA plan. The method does not list which analytes and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct PCB list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.2 Are all samples listed on modified CLP PCBs Florisil/Cartridge Check Form? [ ] ___ [✓]

ACTION: If no, take action specified in 3.2 above.

11.3 Was GPC Cleanup (method 3640A) performed? [ ] ___ [✓]

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.4 Were the same PCB analytes used in calibration used to check the efficiency of the cleanup procedures? [ ] ___ [✓]

11.5 Are percent recoveries (% R) of the PCBs and surrogate compounds used to check the efficiency of the cleanup procedures within lab's in-house QC limits (use 70-130% if not available). [ ] ___ [✓]

Yes NO N/A

70-130% for GPC calibration? [ ] ___ ✓

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 70%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for PCBs. Use professional judgement to qualify positive results if recoveries are greater than the upper limit.

12.0 PCB Identification

12.1 Has CLP Form X or equivalent, showing retention time data for positive results on the two GC columns, been completed for every sample in which a PCB was detected? ✓ [ ] ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and cleanup verification forms)? ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both columns/analyses? ✓ [ ] ___ ___

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

Yes NO N/A

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently.
Were there any false negatives? ___ [V] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation provided when sample concentration was sufficient (> 10 ug/ml) in the final extract? [ ] ___ ✓

ACTION: Indicate with red pencil which Form I results were confirmed by GC/MS and also note in data assessment. GC/MS confirmation is an option, see section 7.10 of Method 8082A-20. If GC/MS confirmation is not available, follow action in section 3.2.

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%?~~ <40% per method. [V] ___ ___

NOTE: The method requires quantitation from one column. The second column is to confirm the presence of an analyte. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier

SAMPLE CALCULATION

Sample ID: VWW06-SS012-0211
Standard ID: ICAL 2/10/11
Compound: AR1254
Concentration: 98 ug/Kg (sum of 5 peaks)
Calculation shows Peak 5: 30.5 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		892415
CF of Compound		10550256.17
Final Volume		10
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	33.26
Initial Volume of Sample		NA
Conversion Factor		1000
Percent Solids Factor		0.834
Concentration	#DIV/0!	30.49408

Peak #	Concentration
1	10.2
2	12.4
3	22.8
4	22.5
5	30.5
Total	**98.4**

Yes NO N/A

0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected)	"NJ"
>50% (PCBs value is <CRQL)	"U"
>200%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that he higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ ☑ ___

NOTE: Single-peak PCBs results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? ☑ ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

Yes NO N/A

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? ☑ ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ ☑ ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for PCB analysis? ☑ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

SW023/SW023P
SS013/SW013P
no + results

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made

Yes NO N/A

to determine the proper identification of field duplicates.

	YES	NO	N/A
A.I.1 Contract Compliance Screening Report Present?	[ ]	___	✓
ACTION: If no, contact RSCC/PO.			
A.I.2 Record of Communication (from RSCC) Present?	[ ]	___	✓
ACTION: If no, request from the RSCC.			
A.1.3 Sampling Trip Report Present and complete?	[ ]	___	✓
ACTION: If no, contact RSCC/PO.			
A.I.4 Chain of Custody/Sample Traffic Report Present?	[✓]	___	___
Legible?	[✓]	___	___
Signature of sample custodian present?	[✓]	___	___
ACTION: If no, contact RSCC/WAM/PO.			
A.I.5 Cover Page Present?	[✓]	___	___
Is the Cover Page properly filled in and the verbatim signed by the lab manager or the manager's designee?	[ ]	___	___
Do the sample identification numbers on the Cover Page agree with sample Identification numbers on:			
(a) Traffic Report Sheet?	[ ]	___	✓

not CLP

	YES	NO	N/A
(b) Form I's?	[✓]	___	___
Is the number of samples on the Cover Page the same as the number of samples on the Traffic Report sheet and the Regional Record of Communication (ROC) for the data Case?	[___]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact RSCC/PO for re-submittal of the corrected Cover Page from the laboratory.

A.1.6 **SDG Narrative, DC-1 & DC-2 Form**

Is the SDG Narrative present?	[✓]	___	___
Is Sample Log-In Sheet(Form DC-1) present and complete?	[___]	___	✓ not CLP
Is Complete SDG Inventory Sheet(Form DC-2) present and complete?	[___]	___	✓

ACTION:
If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.

A.1.7 **Form I to XV**

A.1.7.1 Are all the Form I through Form XV labeled with:

Laboratory Name?	[✓]	___	___
Laboratory Code?	[✓]	___	___
RAS/Non-RAS Case No.?	[___]	___	✓
SDG No.?	[✓]	___	___

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Soil samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3050B.
Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Aluminum at 21.3 UG/L, Barium at 0.347 UG/L, Beryllium at 0.328 UG/L, Cobalt at 0.521 ug/L, Iron at 31.2 UG/L, Magnesium at 19.2 UG/L, Manganese at -0.401 UG/L, Potassium at 98.8 UG/L, Thallium at 4.68 UG/L.
CCB961446 was analyzed on 03/15/11 13:34. The following analyte(s) were detected below RL: Aluminum at 15.3 UG/L, Iron at 18 UG/L, Manganese at -0.68 UG/L, Nickel at -1.45 UG/L.
CCB961465 was analyzed on 03/15/11 15:46. The following analyte(s) were detected below RL: Manganese at -0.769 UG/L, Nickel at -2.12 UG/L, Vanadium at 0.526 UG/L.

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

CCB961490 was analyzed on 03/15/11 18:31. The following analyte(s) were detected below RL: Manganese at -0.74 UG/L, Nickel at -2.24 UG/L.
CCB961502 was analyzed on 03/15/11 19:54. The following analyte(s) were detected below RL: Iron at 9.23 UG/L, Manganese at -0.752 UG/L, Nickel at -1.44 UG/L, Vanadium at 0.451 UG/L.
CCB961514 was analyzed on 03/15/11 21:15. The following analyte(s) were detected below RL: Manganese at -0.831 UG/L, Nickel at -1.66 UG/L.
CCB961526 was analyzed on 03/15/11 22:39. The following analyte(s) were detected below RL: Manganese at -0.779 UG/L, Nickel at -1.72 UG/L, Thallium at 4.78 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. Method Blanks:

All acceptance criteria were met with the exception of:
Blank 70935MB was analyzed with the soil samples on 03/15/11. The following analyte(s) were detected below RL: Aluminum at 2250 UG/KG, Copper at 292 UG/KG, Iron at 3200 UG/KG.

Blank 71036MB was analyzed with the water samples on 03/15/11. The following analyte(s) were detected below RL: Aluminum at 36.2 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken. Samples coded accordingly.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met.

3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

No client requested MS/SD set was analyzed.

Spike performed on SDG 14 none on water

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350200402L was analyzed(at a 10X dilution) with the water samples on 03/15/11. The following analyte(s) exceeded criteria: Aluminum at 180 % with criteria of (10), Iron at 16 % with criteria of (10). The most probable cause for the SD exceeding

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

limits is sample matrix due to the sample requiring a 10X dilution due to being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.

Samples coded accordingly.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.
Sample VWW06-SD014-0211 required a 2X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW018-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW018-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW019-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW019-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW020-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW020-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW021-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW021-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW022-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW022-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

Sample VWW06-SW023-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW023-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW023P-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW023P-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/17/2011

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7470A.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7470A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350200401A was analyzed with the water samples on 02/14/11. The following analyte(s) were recovered below criteria: Mercury at

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

65.3 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

No spikes requested by client.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

341

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Samples were analyzed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7471A.

IV. PREPARATION

Soil samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7471A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met.

3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

No spikes requested by client.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE: 03/16/2011**

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

2

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. **Calibration Blanks:**
All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Aluminum at 21.3 UG/L, Barium at 0.347 UG/L, Beryllium at 0.328 UG/L, Iron at 31.2 UG/L, Magnesium at 19.2 UG/L, Manganese at -0.401 UG/L, Potassium at 98.8 UG/L, Thallium at 4.68 UG/L.
CCB961526 was analyzed on 03/15/11 22:39. The following analyte(s) were detected below RL: Manganese at -0.779 UG/L, Nickel at -1.72 UG/L, Thallium at 4.78 UG/L.
CCB961538 was analyzed on 03/16/11 00:00. The following analyte(s) were detected below RL: Manganese at -0.79 UG/L, Nickel at -1.46 UG/L.
CCB961550 was analyzed on 03/16/11 01:23. The following analyte(s) were detected below RL: Manganese at -0.804 UG/L, Nickel at -1.58 UG/L, Vanadium at 0.486 UG/L.
CCB961560 was analyzed on 03/16/11 02:31. The following analyte(s) were detected below RL: Aluminum at 19.2 UG/L, Iron at 16.7 UG/L, Magnesium at 21.4 UG/L, Manganese at -0.771 UG/L, Nickel at -1.56 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

2. **Method Blanks:**

   All acceptance criteria were met.

C. **Spikes:**

1. **Laboratory Control Spikes (LCS):**

   An LCS/LCSD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met.

2. **Post Digestion Spike:**

   All acceptance criteria were met.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   No spikes requested by client.

D. **Duplicate:**

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. **Serial Dilution:**

All acceptance criteria were met with the exception of:
Serial Dilution 350200402L was analyzed with the water samples on 03/15/11. The following analyte(s) exceeded criteria: Calcium at 360 % with criteria of (10), Magnesium at 360 % with criteria of (10), Potassium at 360 % with criteria of (10). The most probable cause for the analytes exceeding limits is sample matrix due to the sample requiring a 10X dilution for being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

F. **ICP Interference Check Samples:**

All acceptance criteria were met.

G. **Samples:**
Sample analysis proceeded normally.

Sample VWW06-SW018-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW018-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

Sample VWW06-SW019-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW019-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW020-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW020-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW021-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW021-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW022-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW022-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW023-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW023-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

Sample VWW06-SW023P-0211 required a 10X dilution due to the sample being saturated with Sodium causing the Internal Standard to exceed limits. All analytes except for Sodium are reported from the 10X dilution with passing Internal Standard.

Sample VWW06-SW023P-0211 required a 50X dilution due to high concentration of the following analyte(s): Sodium.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

CASE NARRATIVE
MERCURY
DISSOLVED

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7470A.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7470A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350200401A was analyzed with the water samples on 02/14/11. The following analyte(s) were recovered below criteria: Mercury at

CASE NARRATIVE
MERCURY
DISSOLVED

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

68.4 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

No spikes requested by client.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** **03/16/2011**

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : PEL Laboratories Inc.

Project: Vieques

Laboratory Workorder / SDG #: K0215

SW846 6020A

I. SAMPLE RECEIPT

No exceptions or unusual conditions were encountered unless a Sample Condition Notification Form, or other record of communication is included with the Sample Receipt Documentation.

Samples were analyzed for total and dissolved (field filtered) metals. Results are reported in two sub-SDGs, with SK0215 for total metals, and SK0215-D for dissolved metals. Raw data for both sub-SDGs are included following the last Form 15 for the dissolved metals sub-SDG.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

III. METHODS

Samples were analyzed following procedures in laboratory test code: SW846 6020A

IV. PREPARATION

Aqueous Samples were prepared following procedures in laboratory test code: ICP_MS_W_PR(3005A)

Soil Samples were prepared following procedures in laboratory test code: ICP_MS_S_PR(3050B)

V. INSTRUMENTATION

The following instrumentation was used to perform
Instrument Code: X1
Instrument Type: ICPMS
Description: X1
Manufacturer: ThermoFisher
Model: X-Series 2

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

All method blanks were within the acceptance criteria.

C. Spikes:

1. Laboratory Control Spikes (LCS):

Percent recoveries for lab control samples were within the QC limits.

D. Serial Dilution (SD):

Serial Dilution analysis was performed on sample: VWW06-SW020-0211 (K0215-07BSD).

Percent differences were within the QC limits.

G. Samples:

All water samples (except equipment blanks) required analysis at a 100X or 500 X dilutions due to the high Sodium content, internal standard interference, and to protect the instrument. The lowest dilution was reported for each element based on the recoveries of the associated internal standards.

All soil samples and associated QC samples were diluted 5X prior to

analysis. This is expressed as a 500mL final volume for reporting purposes.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed: Edward A. Lamb

Date: 3/8/11

		YES	NO	N/A
	Contract No.?	[✓]	[ ]	[ ]

ACTION:
If no for any of the above, note under Contract Problem/Non-Compliance Section of the "Data Review Narrative" and contact PO for corrected Form(s) from the laboratory.

A.1.7.2 After comparing values on Forms I-IX against the raw data, do any computation/ transcription errors exceed 10% of the reported values on the Forms for:

(a) all analytes analyzed by ICP-AES?	[ ]	[✓]	[ ]
(b) all analytes analyzed by ICP-MS?	[ ]	[✓]	[ ]
(c) Mercury?	[ ]	[✓]	[ ]
(d) Cyanide?	[ ]	[ ]	[✓]

ACTION:
If yes, prepare Telephone Record Log and contact CLP PO/TOPO for the corrected data from the laboratory.

A.1.8 Raw Data

Data shall not be validated without the hard/electronic copies of the associated raw data for samples and QC samples.

A.1.8.1 Digestion/Distillation Log

Digestion Log for ICP-AES (Form XII)present?	[✓]	[ ]	[ ]
Digestion Log for ICP-MS (Form XII) present?	[✓]	[ ]	[ ]
Digestion Log for mercury (Form XII) present?	[✓]	[ ]	[ ]
Distillation Log for cyanide (Form XII) present?	[ ]	[ ]	[✓]
Are pH values for metals and			

	YES	NO	N/A
cyanide reported for each aqueous sample?	☑		
Are percent solids calculations present for soils/sediments? values present not validated	☑		
Are preparation dates present on the sample preparation logs/bench sheets?	☑		

NOTE:
Digestion/Distillation log must include weights, volumes, and dilutions used to obtain the reported results.

A.1.8.2 Is the analytical instrument real-time printouts present for:

ICP-AES?	☑		
ICP-MS?	☑		
Mercury?	☑		
Cyanide?	☐		☑

Are all laboratory bench sheets and instrument raw data printouts necessary to support all sample analyses and QC operations:

Legible?	☑		
Properly labeled?	☑		

Are all field samples, QC samples and field QC samples present on:

Digestion/Distillation log?	☑		
Instrument Printouts?	☑		

ACTION:
If no for any of the above questions in Section A.1.8.1 and Section A.1.8.2, write Telephone Record Log and contact TOPO/PO for re-submittal from the laboratory.

		YES	NO	N/A
A.1.9	**Technical Holding Times**: (Aqueous and soil samples) (Examine sample Traffic Reports and digestion/distillation logs to determine the holding time from the sample collection date to the sample preparation date.)			
A.1.9.1	Cyanide distillation(14 days)exceeded?	_	[ ]	✓
	Mercury analysis(28 days) exceeded?	_	[✓]	_
	Other Metals analysis(180 days)exceeded? ___	___	[✓]	_

ACTION:
If yes, reject (R) and red-line non-detects and flag as estimated (J)results ≥ MDL even if sample(s) was preserved properly.

NOTE:
In addition to qualifying the data, a list of all samples and analytes which exceeded the holding times must be prepared. Report for each sample the number of days that were exceeded. (Subtract the sample collection date from the sample preparation date). Attach this list to the data review narrative.

A.1.9.2	Is pH of aqueous samples for:			
	Metals Analysis ≤ 2?	[✓]	___	___
	Cyanide Analysis ≥ 12?	[ ]	_	✓

ACTION:
If no for any of the above, flag non-detects as "R" and detects as "J".

A.1.9.3	Is the cooler temperature ≤ 10 C°?	[✓]	_	_

ACTION:
If cooler temperature is >10 °C , flag non-detects as "UJ" and detects as "J".

A.1.10 **Final Data Correctness - Form I**

A.1.10.1 Are Form I's for all samples

CH2M HILL VIEQUES CTO-111

METALS CALCULA

SDG 3502004/K0215/K0215D

ICP - AES Dissolved	
SAMPLE ID	VWW06-SW018-0211
ANALYTE	sodium
Lab Value CONCENTRATION (ug/L)	10900000
AMOUNT FROM RAW DATA (ug/L)	219000
SAMPLE SIZE (ml)	50
FINAL VOLUME (L)	50
DILUTION FACTOR	50
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	10950000

FIMS	
SAMPLE ID	VWW06-SW023P-0211
ANALYTE	mercury
Lab Value CONCENTRATION (ug/L)	0.0405
AMOUNT FROM RAW DATA (ug/L)	0.041
SAMPLE SIZE (ml)	25
FINAL VOLUME (ml)	25
DILUTION FACTOR	1
DRYNESS FACTOR	1
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	0.041

ICP-MS	
SAMPLE ID	VWW06-SW020-0211
ANALYTE	copper
Lab Value CONCENTRATION (ug/L)	25.4
AMOUNT FROM RAW DATA (ug/L)	0.254
SAMPLE SIZE (ml)	50
FINAL VOLUME (ml)	50
DILUTION FACTOR	100
DRYNESS FACTOR	1
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	25.4

CH2M HILL VIEQUES CTO-111

SDG 3502004/K0215

METALS CALCULATIONS

ICP - AES	
SAMPLE ID	VWW06-SD014-0211
ANALYTE	LEAD
Lab Value CONCENTRATION (ug/Kg)	3940
AMOUNT FROM RAW DATA (ug/L)	14.2
SAMPLE SIZE (g)	0.999
FINAL VOLUME (L)	0.05
DILUTION FACTOR	1
DRYNESS FACTOR	0.18
CONVERSION FACTOR (g TO Kg)	1000
CALCULATED CONCENTRATION (ug/Kg)	3948

FIMS	
SAMPLE ID	VWW06-SD017-0211
ANALYTE	mercury
Lab Value CONCENTRATION (ug/Kg)	77.1
AMOUNT FROM RAW DATA (ug/L)	0.244
SAMPLE SIZE (g)	0.489
FINAL VOLUME (L)	0.025
DILUTION FACTOR	1
DRYNESS FACTOR	0.162
CONVERSION FACTOR (g TO Kg)	1000
CALCULATED CONCENTRATION (ug/Kg)	77.0

ICP-MS	
SAMPLE ID	
ANALYTE	
Lab Value CONCENTRATION (mg/Kg)	
AMOUNT FROM RAW DATA (ug/L)	
SAMPLE SIZE (g)	
FINAL VOLUME (L)	
DILUTION FACTOR	
DRYNESS FACTOR	
CONVERSION FACTOR (ug/g to mg/Kg)	
CALCULATED CONCENTRATION (ug/Kg)	

	YES	NO	N/A
present and complete?	[✓]		

ACTION:
If no, prepare Telephone Record Log and contact CLP PO/TOPO for submittal from the laboratory.

A.1.10.2 Verify there are no calculation and transcription errors in the results reported on Form I's. Circle on each Form I all results that are incorrect.

Is the calculation error less than 10% of the correct result?	[✓]		
Are results on Form I's reported in correct units (ug/L for aqueous and ~~MG/KG~~ ug/kg for soils)? soils rep in ug/kg per client SAP	[✓]		
Are results on Form I'S reported by correct significant figures?	[✓]		
Are soil sample results on Form I's corrected for percent solids?	[✓]		
Are all "less than MDL" values reported by the ~~CRQLs~~ LODs per client SAP and coded with "U"?	[✓]		
Are values less than the CRQLs but greater than or equal to the MDLs flagged with "J"?	[✓]		
Are appropriate contractual quality control and Method qualifiers used?	[✓]		

ACTION:
If no for any of the above questions, prepare Telephone Record Log, and contact CLP PO/TOPO for corrected data.

A.1.10.3 Do EPA sample identification numbers and the corresponding laboratory sample identification numbers match on the Cover Page, Form I's and in the raw data? [✓]

Was a brief physical description

350

		YES	NO	N/A
	of the samples before and after digestion given on the Form I's?	[ ]	✓	
	Was any sample result outside the mercury/cyanide calibration range or the ICP-AES/ICP-MS linear range diluted and noted on the Form I?	[✓]		
	ACTION: If no for any of the above, note under the Contract-Problem/Non-Compliance Section of the Data Review Narrative.			

many samples diluted due to high Na levels - in ICP-MS this interfered with 15 %R.

A.1.11 **Initial Calibration**

A.1.11.1	Is a record of at least 2 point (A blank and a standard)calibration present for ICP-AES analysis?	[✓]		
	Is a record of at least 2 point (a blank and a standard)calibration present for ICP-MS analysis?	[✓]		
	Is a record of at least 5 point calibration (a blank & 4 standards)present for Hg analysis?	[✓]		
	Is a record of at least 4 point calibration (a blank & 4 standards)present for cyanide?	[ ]		✓
	ACTION: If incomplete or no initial calibration was performed, reject (R) and red-line the associated data (detects & non-detects).			
	Is one initial calibration standard at the CRQL level for cyanide and mercury?	[✓]		
	ACTION: If no, write in the Contract Problem/ Non-Compliance Section of the Data Review Narrative.			
A.1.11.2	Is the curve correlation coefficient $\geq$ 0.995 for:			

		YES	NO	N/A
	Mercury Analysis?	[✓]	___	___
	Cyanide Analysis?	[✓]	___	___
	ICP-AES (more than 2 point Calib.)?	[___]	___	✓
	ICP-MS (more than 2 point calib.)?	[✓]	___	___

ACTION:
If no, qualify the associated sample results ≥ MDL as estimated "J" and non-detects as "UJ".

NOTE:
The correlation coefficient shall be calculated by the data validator using standard concentrations and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.12 Initial and Continuing Calibration Verification- Form IIA

A.1.12.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for ICP-AES and ICP-MS when both these methods were used for the same analyte?	[1]	___	✓

ACTION:
If no for any of the above, prepare a Telephone Record Log and contact PO/TOPO for re-submittal from the laboratory.

A.1.12.2	Was a Continuing Calibration Verification performed every 10 samples or every 2 hours whichever is more frequent?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.12.3	Was an ICV or a mid-range standard distilled and analyzed with each batch of cyanide samples?	[___]	___	✓

	YES	NO	N/A

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative and qualify results ≥ MDL as estimated (J).

A.1.12.2 Circle on each Form IIA all percent recoveries that are outside the contract windows.

Are ICV/CCVs within control limits for:

Metals - 90-110%R?	[✓]	___	___
Hg - 80-120%R?	[✓]	___	___
Cyanide - 85-115%R?	[___]	___	✓

ACTION:
If no, qualify all samples between a previous technically acceptable CCV standard and a subsequent technically acceptable CCV standard as follows as follows:

Qualify as estimated (J) all detects and non-detects, if the ICV/CCV %R is between 75-89%(65-79% for Hg; 70-84% for CN). Qualify only positive results(≥ MDL) as "J" if the ICV/CCV %R is between 111-125%(121-135% for Hg;116-130% for CN). Reject (R) and red-line only
detects if the recovery is greater than 125% (135% for Hg; 130% for CN). Reject (R) and red-line all associated results (hits and non-detects)if the recovery is less than 75%(65% for Hg;70% for CN).

NOTE:
For ICV that does not fall within the acceptance limits, qualify all samples reported from the analytical run.

A.1.12.3 Was the distilled ICV or mid-range standard for cyanide within acceptance limits (85-115%)? [___] ___ ✓

ACTION:
If no, Qualify all cyanide results ≥ MDL as "J".

A.1.13 **CRQL Standard Analysis - Form IIB**

A.1.13.1 For each ICP-AES run, was a CRI

	YES	NO	N/A
(CRQL or MDL when MDL > CRQL) standard analyzed? **(Note:CRI is not required for Al, Ba, Ca, Fe, Mg, Na and K.)**	[___]	___	___
For each ICP-MS run, was a CRI (CRQL or MDL when MDL > CRQL) standard analyzed for each mass/isotope used for the analysis?	[✓]	___	___
For each mercury run, was a CRQL standard analyzed?	[___]	✓	___
For each cyanide run, was a CRQL standard analyzed?	[___]	___	✓

SS provided that presented %Rs for these stds.

*lab analyzed a ICAL std at RL & recoveries were within 70-130

ACTION:
If no for any of the above, write this deficiency in the Contract Problems/ Non-Compliance Section of the Data Review Narrative, inform CLP PO and flag results in the affected ranges (detects <2xCRQL)as J and non-detects UJ.

sample required by SW846 at beginning of run only

The affected ranges are:
ICP-AES Analysis - *True Value ± CRQL
ICP-MS Analysis - *True Value ± CRQL
Mercury Analysis - *True Value ± CRQL
Cyanide Analysis - *True Value ± CRQL
*** True value of the CRQL Standard**

A.1.13.2	Was a CRQL standard analyzed after the ICV/ICB, before the final CCV/CCB and once every 20 analytical samples in the analytical run for each analysis?	[___]	___	✓

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the "Data Review Narrative".

A.1.13.3 Circle on each Form IIB all percent recoveries that are outside the acceptance windows.

Jacqueline Cleveland

From: Edward Lawler [Mitkem] [elawler@mitkem.com]
Sent: Wednesday, April 13, 2011 1:28 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020
Attachments: PEL_VIEQUES-LLICV.metals.xls

Jackie—

Attached is an Excel file containing all the Low Level ICVs (LLICVs) for the Vieques SDGs for Method 6020.

This is right out of our database. There is a separate section of the spreadsheet for each ICP/MS run, also identifying which Mitkem SDGs were analyzed in that run.

These data probably include extra elements, which were included for other samples analyzed in the same run.

Please let me know if you have any questions, or need any additional information.

--Ed

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 6:27 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Thanks Ed,

I will wait for the summary pages!

Jackie

From: Edward Lawler [Mitkem] [mailto:elawler@mitkem.com]
Sent: Tuesday, April 12, 2011 4:03 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Hi Jackie—

That check standard is included in all of the SDGs. We call it the Low Level ICV (or LLICV). Our CLP-type inorganics data reporting software doesn't have a form to report these on, so they are included in the raw data for each SDG, but not on the reporting forms.

For example, in Mitkem SDG K0204, the LLICV is listed as the 10th run on page 0064, and the raw data for this run are on page 0092—but this data is somewhat difficult to follow.....

We are working on something to get you the summaries of %recoveries, which I will hopefully have to you tomorrow.

--Ed

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:25 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU 6 Metals by 6020

Good Afternoon Ed,

I am doing data validation for CH2M HILL for the Vieques SWMU 6 data for which you were subcontracted to perform the 6020 metals analyses. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects Work Order #s K0204, K0225, K0205, K0201 & K0215. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

364

K0204 X1_110223A

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Arsenic	2.30064728	2	2.30064728	2.3	2	0.19	0.5	2	115.03%		70	130
A	Y	Chromium	2.01545733	2	2.01545733	2	2	0.16	0.5	2	100.77%		70	130
A	Y	Selenium	5.66130075	5	5.66130075	5.7	5	0.15	0.5	5	113.23%		70	130

K0201 X1_110216B

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Aluminum	21.0027562	20	21.0027562	21	20	2.9	5	20	105.01%		70	130
A	Y	Antimony	2.12426401	2	2.12426401	2.1	2	0.2	0.2	2	106.21%		70	130
A	Y	Arsenic	2.00593914	2	2.00593914	2	2	0.19	0.5	2	100.30%		70	130
A	Y	Barium	10.0122643	10	10.0122643	10	10	1.3	3	10	100.12%		70	130
A	Y	Beryllium	1.00140666	1	1.00140666	1	1	0.072	0.2	1	100.14%		70	130
A	Y	Cadmium	1.00829914	1	1.00829914	1	1	0.084	0.2	1	100.83%		70	130
A	Y	Calcium	472.76306	500	472.76306	470	500	24	38	500	94.55%	J	70	130
A	Y	Chromium	2.03706028	2	2.03706028	2	2	0.16	0.5	2	101.85%		70	130
A	Y	Cobalt	1.06535199	1	1.06535199	1.1	1	0.024	0.1	1	106.54%		70	130
A	Y	Copper	2.15205123	2	2.15205123	2.2	2	0.23	0.6	5	107.60%	J	70	130
A	Y	Iron	192.148667	200	192.148667	190	200	14	40	200	96.07%	J	70	130
A	Y	Lead	0.97907404	1	0.97907404	0.98	1	0.068	0.2	1	97.91%	J	70	130
A	Y	Magnesium	527.600786	500	527.600786	530	500	7.8	12	500	105.52%		70	130
A	Y	Manganese	5.4470818	5	5.4470818	5.4	5	0.83	1	5	108.94%		70	130
A	Y	Nickel	1.0502218	1	1.0502218	1.1	1	0.17	0.25	1	105.02%		70	130
A	Y	Potassium	484.529478	500	484.529478	480	500	14	40	500	96.91%	J	70	130
A	Y	Selenium	5.36275801	5	5.36275801	5.4	5	0.15	0.5	5	107.26%		70	130
A	Y	Silver	1.01190753	1	1.01190753	1	1	0.022	0.05	1	101.19%		70	130
A	Y	Sodium	487.672118	500	487.672118	490	500	33	50	500	97.53%	J	70	130
A	Y	Thallium	0.9840832	1	0.9840832	0.98	1	0.048	0.1	1	98.41%	J	70	130
A	Y	Vanadium	5.4149342	5	5.4149342	5.4	5	0.61	1	5	108.30%		70	130
A	Y	Zinc	5.54426374	5	5.54426374	5.5	5	0.73	1	5	110.89%		70	130

K0201, K0205 X1_110217B

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	2.07949727	2	2.07949727	2.1	2	0.2	0.2	2	103.97%		70	130
A	Y	Arsenic	2.00792532	2	2.00792532	2	2	0.19	0.5	2	100.40%		70	130
A	Y	Cadmium	0.9580971	1	0.9580971	0.96	1	0.084	0.2	1	95.81%	J	70	130
A	Y	Chromium	1.84630224	2	1.84630224	1.8	2	0.16	0.5	2	92.32%	J	70	130
A	Y	Cobalt	0.98179571	1	0.98179571	0.98	1	0.024	0.1	1	98.18%	J	70	130
A	Y	Copper	1.81974453	2	1.81974453	1.8	2	0.23	0.6	5	90.99%	J	70	130
A	Y	Lead	0.95434051	1	0.95434051	0.95	1	0.068	0.2	1	95.43%	J	70	130
A	Y	Silver	0.97534637	1	0.97534637	0.98	1	0.022	0.05	1	97.53%	J	70	130

K0215, K0225 **X1_110222A**

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	1.8964567	2	1.8964567	1.9	2	0.2	0.2	2	94.82%	J	70	130
A	Y	Arsenic	2.13301722	2	2.13301722	2.1	2	0.19	0.5	2	106.65%		70	130
A	Y	Barium	10.7561986	10	10.7561986	11	10	1.3	3	10	107.56%		70	130
A	Y	Beryllium	1.03423982	1	1.03423982	1	1	0.072	0.2	1	103.42%		70	130
A	Y	Cadmium	1.04382134	1	1.04382134	1	1	0.084	0.2	1	104.38%		70	130
A	Y	Chromium	1.87146555	2	1.87146555	1.9	2	0.16	0.5	2	93.57%	J	70	130
A	Y	Cobalt	1.06305979	1	1.06305979	1.1	1	0.024	0.1	1	106.31%		70	130
A	Y	Copper	2.20898143	2	2.20898143	2.2	2	0.23	0.6	5	110.45%	J	70	130
A	Y	Iron	195.167776	200	195.167776	200	200	14	40	200	97.58%	J	70	130
A	Y	Lead	1.0698727	1	1.0698727	1.1	1	0.068	0.2	1	106.99%		70	130
A	Y	Nickel	1.01332509	1	1.01332509	1	1	0.17	0.25	1	101.33%		70	130
A	Y	Selenium	5.56241436	5	5.56241436	5.6	5	0.15	0.5	5	111.25%		70	130
A	Y	Silver	1.00087559	1	1.00087559	1	1	0.022	0.05	1	100.09%		70	130
A	Y	Thallium	1.07403596	1	1.07403596	1.1	1	0.048	0.1	1	107.40%		70	130
A	Y	Vanadium	5.44821072	5	5.44821072	5.4	5	0.61	1	5	108.96%		70	130
A	Y	Zinc	5.63784043	5	5.63784043	5.6	5	0.73	1	5	112.76%		70	130

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Wednesday, April 13, 2011 11:08 AM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU6

Jackie:

Good afternoon.

Per our QAO:
The mercury procedures were reviewed. The calibration curve is digested with every batch analyzed. The low cal standard is at 0.2ug/L which is the Reporting Limit.
PEL does not check an LLQC sample regularly at this time but as the low cal standard is at the RL and carried through the entire process any raw data from a cal curve could be used to verify an LLQC.
Using the Raw Data from the regular Hg analysis for SDG 3501977 the recovery for the low cal standard, 0.2ug/L, yielded a 78.3% recovery, meeting the +/-30% criteria.

For example on SDG 3501977, CS1 data can be found in the metals raw data section on page 4531.

Please let me know if you have any questions or concerns.

Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:35 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU6

Good Afternoon John,

I have a request regarding the mercury analysis. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects all 5 SDGs. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. If the standards are there and I am just missing them let me know! Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

	YES	NO	N/A
Is the CRQL standard within control limits for:			
Metals(ICP-AES/ICP-MS)- 70 - 130%?	[✓]		
Mercury- 70 - 130%?	[✓]		
Cyanide - 70 - 130%?	[ ]		✓

see note at * on prev. page

ACTION:
If no, flag detects <2xCRQL as "J" and non-detects as "UJ" if the CRQL standard recovery is between 50-69%. Flag(J) only detects <2xCRQL if the recovery is between 131% and ≤180%. If the recovery is less than 150%, reject(R) and red-line non-detects and detects < 2xCRQL, and flag (J) detects between 2xCRQL and ICV/CCV. Reject and red-line only detects <2xCRQL and flag (J)detects ≥ 2xCRQL but < ICV/CCV if the recovery is > 180%.

NOTE:
1. Qualify all field samples analyzed between a previous technically acceptable analysis of the CRQL standard and a subsequent acceptable analysis of the CRQL standard
2. Flag (J) or reject (R) only the final sample results on Form I's when Sample raw data are within the affected ranges and the CRQL standard is outside the acceptance windows.
3. The samples and the CRQL standard must be analyzed in the same analytical run.

A.1.14 Initial and Continuing Calibration Blanks - Form III

		YES	NO	N/A
A.1.14.1	Present and complete for all the instruments used for the metals and cyanide analyses?	[✓]		
	Was an initial Calibration Blank analyzed after ICV?	[✓]		
	Was a continuing Calibration Blank analyzed after every CCV and every 10 samples or every 2 hours, whichever is more frequent?	[✓]		
	Were the ICB & CCB values ≥ MDL but < CRQL reported on Form III and flagged "J" by			

		YES	NO	N/A
	using MDLs from direct analysis(Preparation Method "NP1")? (Check Form III against the raw data)	[✓]	___	___

ACTION:
If no, inform CLP PO/TOPO and make a note in the Contract-Problems/Non-Compliance Section of the "Data Review Narrative".

A.1.14.2 Circle with red pencil on each Form III all Calib. Blank values that are:

≥ MDL but ≤ CRQL

> CRQL

A.1.14.2.1	When MDL < CRQL, is any Calib. Blank value ≥ MDL but ≤ CRQL?	✓	[___]	___

ACTION:
If yes, change sample results ≥ MDL but ≤ CRQL to the CRQL with a "U". Do not qualify non-detects.

A.1.14.2.2	When MDL < CRQL, is any Calib. Blank value > CRQL?	___	[✓]	___

ACTION:
If yes, reject (R) and red line the associated sample results > CRQL but <ICB/CCB Blank Result. Flag as "J" detects > ICB/CCB blank value but < 10xICB/CCB value. Change the sample results ≥ MDL but ≤ the CRQL to CRQL with a "U".

A.1.14.2.3	Is any Calibration Blank value below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated all associated sample results ≥ CRQL but <10xCRQL.

NOTE:
1. For ICB that does not meet the technical QC Criteria, apply the action to all samples

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502004

Preparation Blank Matrix (water/soil): SOIL

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/KG

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Aluminum	21.3	J	22.3	J	100	U	100	U	2250	J	P
Antimony	10.24	U	10.24	U	10.24	U	10.24	U	469	U	P
Barium	0.347	J	10	U	10	U	10	U	312	U	P
Beryllium	0.328	J	3.65	U	0.127	J	3.65	U	312	U	P
Cadmium	0.556	J	5.12	U	5.12	U	0.555	J	97.6	U	P
Calcium	100	U	100	U	100	U	100	U	6440	U	P
Cobalt	0.521	J	5.12	U	5.12	U	5.12	U	97.6	U	P
Copper	5.12	U	5.12	U	5.12	U	5.12	U	292	J	P
Iron	31.2	J	21.9	J	40	U	40	U	3200	J	P
Lead	8.192	U	8.192	U	8.192	U	8.192	U	664	U	P
Magnesium	19.2	J	21.6	J	100	U	100	U	5660	U	P
Manganese	-0.401	J	-0.808	J	-0.848	J	-0.802	J	312	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	7.4	U	CV
Nickel	4.1	U	-1.33	J	-1.54	J	-1.02	J	312	U	P
Potassium	98.8	J	500	U	500	U	500	U	9760	U	P
Selenium	9	U	9	U	9	U	9	U			P
Silver	5.12	U	5.12	U	5.12	U	5.12	U	312	U	P
Sodium	300	U	300	U	300	U	300	U	19500	U	P
Thallium	4.68	J	10	U	6.22	J	10	U	664	U	P
Vanadium	9	U	9	U	9	U	9	U	312	U	P
Zinc	20	U	20	U	20	U	20	U	644	U	P

ICB IDs: CV= ICB949524, P= ICB961289

CCB1 IDs: CV= CCB949526, P= CCB961294

CCB2 IDs: CV= CCB949538, P= CCB961296

CCB3 IDs: CV= CCB949550, P= CCB961297

180311 1923

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502004

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

SW's T

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C	5	C	6	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U	36.2	J	P
Antimony			10.24	U	10.24	U	10.24	U			P
Barium			10	U	10	U	10	U	0.44	U	P
Beryllium			3.65	U	3.65	U	3.65	U	0.24	U	P
Cadmium			5.12	U	5.12	U	5.12	U			P
Calcium			122	=	119	=	99.6	J	78	U	P
Cobalt			5.12	U	5.12	U	5.12	U			P
Copper			5.12	U	5.12	U	5.12	U			P
Iron			40	U	40	U	40	U	11	U	P
Lead			8.192	U	8.192	U	8.192	U			P
Magnesium			100	U	100	U	100	U	19.6	U	P
Manganese			-0.673	J	-0.706	J	-0.699	J	0.7	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.074	U	CV
Nickel			4.1	U	4.1	U	4.1	U	1.86	U	P
Potassium			500	U	500	U	500	U	143	U	P
Selenium			9	U	4.87	J	9	U	8.2	U	P
Silver			5.12	U	5.12	U	5.12	U			P
Sodium			300	U	300	U	300	U	300	U	P
Thallium			10	U	10	U	10	U	8.8	U	P
Vanadium			9	U	9	U	9	U	0.88	U	P
Zinc			20	U	20	U	20	U	8	U	P

NQ

none assoc

ICB IDs: CV= ICB950355

CCB1 IDs: CV= CCB949562, P= CCB961309

CCB2 IDs: CV= CCB949566, P= CCB961310

CCB3 IDs: CV= CCB950357, P= CCB961320

180311 1923

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502004

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 7	C	8	C	9	C	Prepa-ration Blank	C	M
Aluminum			15.3	J	100	U	100	U			P
Antimony			10.24	U	10.24	U	10.24	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	3.65	U	3.65	U			P
Cadmium			5.12	U	5.12	U	5.12	U			P
Calcium			100	U	100	U	100	U			P
Cobalt			5.12	U	5.12	U	5.12	U			P
Copper			5.12	U	5.12	U	5.12	U			P
Iron			18	J	40	U	40	U			P
Lead			8.192	U	8.192	U	8.192	U			P
Magnesium			100	U	100	U	100	U			P
Manganese			-0.68	J	-0.769	J	-0.806	J			P
Mercury			0.2	U	0.2	U	0.2	U			CV
Nickel			-1.45	J	-2.12	J	-1.72	J			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Silver			5.12	U	5.12	U	5.12	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	10	U	10	U			P
Vanadium			9	U	0.526	J	9	U			P
Zinc			20	U	20	U	20	U			P

none none

ICB IDs: 50014 15 16 17 01 02

CCB1 IDs: CV= CCB950369, P= CCB961446

CCB2 IDs: CV= CCB950381, P= CCB961465

CCB3 IDs: CV= CCB950393, P= CCB961477

180311 1923

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502004

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 10	C	11	C	12	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U			P
Antimony			10.24	U	10.24	U	10.24	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	3.65	U	3.65	U			P
Cadmium			5.12	U	5.12	U	5.12	U			P
Calcium			100	U	100	U	100	U			P
Cobalt			5.12	U	5.12	U	5.12	U			P
Copper			5.12	U	5.12	U	5.12	U			P
Iron			40	U	9.23	J	40	U			P
Lead			8.192	U	8.192	U	8.192	U			P
Magnesium			100	U	100	U	100	U			P
Manganese			-0.74	J	-0.752	J	-0.831	J			P
Mercury			0.2	U	0.2	U					CV
Nickel			-2.24	J	-1.44	J	-1.66	J			P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Silver			5.12	U	5.12	U	5.12	U			P
Sodium			300	U	300	U	300	U			P
Thallium			10	U	10	U	10	U			P
Vanadium			9	U	0.451	J	9	U			P
Zinc			20	U	20	U	20	U			P

none

SW023
SW023 DL

SW022
SW022DL
SW021

SW021 DL
018
018 DL
019
019 DL
020
020 DL
023P
023P DL

ICB IDs:

CCB1 IDs: CV= CCB950404, P= CCB961490

CCB2 IDs: CV= CCB950408, P= CCB961502

CCB3 IDs: P= CCB961514

180311 1923

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502004

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 13	C		C		C	Prepa-ration Blank	C	M
Aluminum			100	U							P
Antimony			10.24	U							P
Barium			10	U							P
Beryllium			3.65	U							P
Cadmium			5.12	U							P
Calcium			100	U							P
Cobalt			5.12	U							P
Copper			5.12	U							P
Iron			40	U							P
Lead			8.192	U							P
Magnesium			100	U							P
Manganese			-0.779	J	NQ						P
Mercury											CV
Nickel			-1.72	J	NQ						P
Potassium			500	U							P
Selenium			9	U							P
Silver			5.12	U							P
Sodium			300	U							P
Thallium			4.78	J							P
Vanadium			9	U							P
Zinc			20	U							P

See prev page for assoc.

ICB IDs:

CCB1 IDs: P= CCB961526

CCB2 IDs:

CCB3 IDs:

180311 1923

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3502004

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	21.3	J	22.3	J	100	U	100	U	18.6	U	P
Barium	0.347	J	10	U	10	U	10	U	0.44	U	P
Beryllium	0.328	J	3.65	U	0.127	J	3.65	U	0.24	U	P
Calcium	100	U	100	U	100	U	100	U	78	U	P
Iron	31.2	J	21.9	J	40	U	40	U	11	U	P
Magnesium	19.2	J	21.6	J	100	U	100	U	19.6	U	P
Manganese	-0.401	J	-0.808	J	-0.848	J	-0.802	J	0.7	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.074	U	CV
Nickel	4.1	U	-1.33	J	-1.54	J	-1.02	J	1.86	U	P
Potassium	98.8	J	500	U	500	U	500	U	143	U	P
Selenium	9	U	9	U	9	U	9	U	8.2	U	P
Sodium	300	U	300	U	300	U	300	U	300	U	P
Thallium	4.68	J	10	U	6.22	J	10	U	8.8	U	P
Vanadium	9	U	9	U	9	U	9	U	0.88	U	P
Zinc	20	U	20	U	20	U	20	U	8	U	P

all sw's D

none assoc

ICB IDs: CV= ICB949524, P= ICB961289

CCB1 IDs: CV= CCB949526, P= CCB961294

CCB2 IDs: CV= CCB949538, P= CCB961296

CCB3 IDs: CV= CCB949550, P= CCB961297

Flag U at LOD all > MDL ≤ LOD in all Dissolved Field Samples.

180311 1924

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502004

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg): D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 13	C	14	C	15	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U			P
Barium			10	U	10	U	10	U			P
Beryllium			3.65	U	3.65	U	3.65	U			P
Calcium			100	U	100	U	100	U			P
Iron			40	U	40	U	40	U			P
Magnesium			100	U	100	U	100	U			P
Manganese			-0.779	J	NQ -0.79	J	NQ -0.804	J	NQ		P
Mercury											CV
Nickel			-1.72	J	NQ -1.46	J	NQ -1.58	J	NQ		P
Potassium			500	U	500	U	500	U			P
Selenium			9	U	9	U	9	U			P
Sodium			300	U	sol 300	U	300	U			P
Thallium			4.78	J	ICB 10	U	10	U			P
Vanadium			9	U	9	U	0.486	J			P
Zinc			20	U	20	U	20	U			P

SW023
SW023DL

SW022
SW022DL
SW021
SW021DL
SW018
SW018DL
SW019

SW019DL
SW020
SW020DL
SW023P
SW023P

ICB IDs:

CCB1 IDs: P= CCB961526

CCB2 IDs: P= CCB961538

CCB3 IDs: P= CCB961550

180311 1924

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques/SWMU 6/402244.FI.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502004

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg): D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 16	C		C		C	Prepa-ration Blank	C	M
Aluminum			19.2	U	See ICB						P
Barium			10	U							P
Beryllium			3.65	U							P
Calcium			100	U							P
Iron			16.7	J	See ICB						P
Magnesium			21.4	J	See ICB						P
Manganese			-0.771	J	ND						P
Mercury											CV
Nickel			-1.56	J	ND						P
Potassium			500	U							P
Selenium			9	U							P
Sodium			300	U							P
Thallium			10	U							P
Vanadium			9	U							P
Zinc			20	U							P

SW019DL
SW020
SW020DL
SW023P
SW023PDL

ICB IDs:

CCB1 IDs: P= CCB961560

CCB2 IDs:

CCB3 IDs:

180311 1924

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Preparation Blank Matrix (soil/water): SOIL Method Blank ID: MB-57563

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

X1_110223A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Arsenic	0.291	B	0.190	U	0.190	U	0.190	U	0.370	U	MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U	0.140	U	MS
Selenium	0.172	B	-0.186	B	0.150	U	0.150	U	0.150	U	MS

assoc with SD's

all SD assoc.

none assoc

CCB4 & CCB5 - Clean

✓ U @ LOD all > MDL ≤ LOD in Sediments.

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215

Preparation Blank Matrix (soil/water): WATER Method Blank ID: MB-57513

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

X1_110222A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.429	B	0.200	U	0.200	U	0.200	U	0.200	U	MS
Arsenic	0.292	B	0.190	U	0.190	U	0.190	U	0.190	U	MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U	0.084	U	MS
Chromium	0.160	U	-0.208	B	-0.248	B	-0.240	B	0.160	U	MS
Cobalt	0.173	B	0.024	U	0.024	U	0.024	U	0.024	U	MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U	0.230	U	MS
Lead	0.217	B	0.069	B	0.068	U	0.068	U	0.068	U	MS
Silver	0.044	B	0.160	B	0.022	U	-0.032	B	0.022	U	MS

assoc with SW's

EB01-020811

SW0221:500 ? SW021 1:500

more

As Co Cr Cu

✓ flag as U at LOD all >MDL ≤ LOD in field samples

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0215

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110222A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.190	U	0.190	U	0.190	U			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			-0.209	B	-0.169	B	0.160	U			MS
Cobalt			0.024	U	0.024	U	0.024	U			MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.068	U	0.068	U	0.068	U			MS
Silver			-0.031	B	-0.024	B	0.022	U			MS

SW5 none SW023P 1:100 all SW018 1:100 all

023 1:100 all SW019 1:100 all

Sb Cd 022 1:100 SW020 1:100 all

Pb Ag 021 1:100

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0215-D

Preparation Blank Matrix (soil/water): WATER Method Blank ID: MB-57513

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

X1_110222A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.429	B	0.200	U	0.200	U	0.200	U	0.200	U	MS
Arsenic	0.292	B	0.190	U	0.190	U	0.190	U	0.190	U	MS
Cadmium	0.084	U	0.084	U	0.084	U	0.084	U	0.084	U	MS
Chromium	0.160	U	-0.208	B	-0.248	B	-0.240	B	0.160	U	MS
Cobalt	0.173	B	0.024	U	0.024	U	0.024	U	0.024	U	MS
Copper	0.230	U	0.230	U	0.230	U	0.230	U	0.230	U	MS
Lead	0.217	B	0.069	B	0.068	U	0.068	U	0.068	U	MS
Silver	0.044	B	0.160	B	0.022	U	-0.032	B	0.022	U	MS

NQ

EB01 all

SW023 1:500
221 1:500
211 1:500
As Co Cr Cu

none

SW's

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0215-D

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110222A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 4	C	5	C	6	C	Preparation Blank	C	M
Antimony			0.200	U	0.200	U	0.200	U			MS
Arsenic			0.190	U	0.190	U	0.190	U			MS
Cadmium			0.084	U	0.084	U	0.084	U			MS
Chromium			-0.209	B	NQ -0.169	B	NQ 0.160	U			MS
Cobalt			0.024	U	0.024	U	0.024	U			MS
Copper			0.230	U	0.230	U	0.230	U			MS
Lead			0.068	U	0.068	U	0.068	U			MS
Silver			-0.031	B	NQ -0.024	B	NQ 0.022	U			MS

none SW023P 1:100 all
23 1:1000 Sb Cd Pb Ag
22 1:100
21 1:100

SW018 1:100 all
SW019
SW020

	YES	NO	N/A

reported from the analytical run.
2. For CCBs that do not meet the technical QC criteria, apply the action to all samples analyzed between a previous technically acceptable analysis of CCB and a subsequent technically acceptable analysis of the CCB in the analytical run.,

A.1.15 **Preparation Blank - FORM III**

NOTE: The Preparation Blank for mercury is the same as the calibration blank.

A.1.15.1 Was one Preparation Blank prepared with and analyzed for:

Each Sample Delivery Group (SDG)?	[✓]	___	___
Each batch of the SDG samples digested/distilled?	[✓]	___	___
Each matrix type?	[✓]	___	___
All instruments used for metals and cyanide analyses?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the associated positive data <10xMDL for which the Preparation Blank was not analyzed.

NOTE:
If only one blank was analyzed for more than 20 samples, then the first 20 samples analyzed are not estimated(J), but all additional samples must be qualified (J).

A.1.15.2 Circle with red pencil on each Form III all Prep. Blank values that are:

≥ MDL but ≤ CRQL, and

> CRQL

A.1.15.2.1 When MDL < CRQL, is any preparation blank value ≥ MDL but ≤ CRQL?	✓	[___]	___

ACTION:
If yes, change sample result ≥ MDL

		YES	NO	N/A
	but ≤ CRQL to CRQL with a "U".			
A.1.15.2.2	When the MDL ≤ CRQL, is any Preparation Blank value greater than its CRQL?	___	[✓]	___
	If yes, is the Prep. Blank value greater than the value of the associated Field Blank collected and analyzed with the SDG samples?	___	[___]	✓
	If yes, is the lowest concentration of that analyte in the associated samples less than 10 times the Preparation Blank value?	___	[___]	✓

ACTION:
If yes, reject (R) and red-line all associated sample results greater than the CRQL but less than the Prep.Blank value. Flag as "J" detects > Prep. Blank value but <10xPrep.Blank. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

If the Prep. Blank value is less than the same analyte value in the Field Blank, do not qualify the sample results due to the Prep. Blank criteria.

NOTE:
Convert soil sample result to mg/Kg on wet weight basis to compare with the soil Prep. Blank result on Form III.

A.1.15.2.3	Is the Prep. Blank concentration below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) all associated sample results less than 10xCRQL. Qualify non-detects as estimated (UJ).

A.1.15.2.4	When the MDL is greater than the CRQL, is the preparation blank concentration on Form III greater than two times the MDL?	___	[___]	✓

ACTION:

		YES	NO	N/A
	If yes, reject (R) and red-line all positive sample results with sample raw data less than 10 times the Preparation Blank value.			
A.1.16	**ICP-AES/ICP-MS Interference Check Sample (ICS)- Form IV** **NOTE:** Not required for CN, Hg, Al, Ca, Fe and Mg.			
A.1.16.1	Present and complete?	[✓]	___	___
	Was ICS analyzed at the beginning and end of each analytical run, and once for every 20 analytical samples?	[✓]	✓	___
	Was ICS analyzed at the beginning of the ICP-MS analytical run?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all sample results.			
A.1.16.2	**ICP-AES Method**			
A.1.16.2.1	**ICSA Solution:** For ICP-AES, are the ICSA "Found" analyte values within the control limits ± of CRQL of the true/established mean value?	[✓]	___	___
	If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSA Solution on Form IV?	[___]	___	✓
	ACTION: If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run: Flag (J) as estimated only sample results ≥MDL			

X1 corr JAC @ beginning only

	YES	NO	N/A

for which the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag non-detects as "UJ" and detects as "J".

A.1.16.2.3 **ICSAB Solution**

For ICP-AES, are all analyte results in ICSAB within the control limits of 80-120 of the true/established mean value? [✓] ___ ___

If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSAB Solution on Form IV? [___] ___ ✓

ACTION:
If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79%, qualify sample results ≥ MDL as "J" and non-detects as "UJ". Reject (R) and red-line all sample results (detects & non-detects) for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only positive results.

A.1.16.3 **ICP-MS Method**

A.1.16.3.1 **ICSA Solution:**

For ICP-MS, are the ICSA "Found" analyte values within the control limits of ±CRQL of the true/established mean value? [✓] ___ ___

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated only sample results ≥ MDL if the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag the associated sample detects as "J" and non-detects as "UJ".

		YES	NO	N/A
A.1.16.3.3	**ICSAB Solution** For ICP-MS, are all analyte results in ICSAB within the control limits of 80-120% of the true/established mean value, whichever is greater?	[✓]	___	___

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79% flag (J) as estimated the associated sample results ≥ MDL. Reject (R) and red-line those all sample detects and non-detects for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only detects (≥ MDL).

A.1.17 **Spiked Sample Recovery: Pre-Digestion/Pre-Distillation)-Form V A**
Note: Not required for Ca, Mg, K, and Na (both matrices); Al and Fe (soil only)

		YES	NO	N/A
A.1.17.1	Was Matrix Spike analysis performed:			
	For each matrix type?	[✓]	___	___
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each concentration range (i.e., low, med., high)?	[✓]	___	___
	For each analytical Method (ICP-AES, ICP-MS, Hg, CN) used?	[✓]	___	___
	Was a spiked sample prepared and analyzed with the SDG samples?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the positive data for which a spiked sample was not analyzed.

NOTE:
If more than one spiked sample were analyzed for one SDG, then qualify the associated data based on the worst spiked sample analysis.

		YES	NO	N/A
A.1.17.2	Was a field blank or PE sample used for the spiked sample analysis?	___	[✓]	___
	ACTION: If yes, flag (J) as estimated positive data of the associated SDG samples for which field blank or PE sample was used for the spiked sample analysis.			
A.1.17.3	Circle on each Form VA all spike recoveries that are outside the control limits (75-125%) that have sample concentrations less than four times the added spike concentrations. used lab QC limits per SOP / client SAP			
	Are all recoveries within the control limits when sample concentrations are less than or equal to four times the spike concentrations?	[___]	✓	___
	NOTE: Disregard the out of control spike recoveries for analytes whose concentrations are greater than or equal to four times the spike added.			
	Are results outside the control limits (75-125%) flagged with Lab Qualifier "N" on Form I's and Form VA? used lab QC limits	[✓]	___	___
	ACTION: If no for any of the above, write in the Contract - Problems/Non-Compliance Section of the Data Review Narrative.			
A.1.17.4	**Aqueous**			
	Are any spike recoveries:			
	(a) less than 30%?	___	[___]	✓ ___
	(b) between 30-74%?	___	[___]	✓ ___
	(c) between 126-150%?	___	[___]	✓ ___
	(d) greater than 150%?	___	[___]	✓ ___
	ACTION: If the matrix spike recovery is less than 30%, reject (R) and red-line all associated aqueous data (detects & non-detects). If between 30-74%, qualify all associated aqueous data ≥ MDL as "J" and non-detects			no water spikes performed

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SD014-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.F

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 18

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	35000000		8470000		14400000	184.2	N	P
Antimony	80 - 120	108000		1330	U	144000	75	N	P
Barium	80 - 120	427000		8210		433000	96.7		P
Beryllium	80 - 120	148000		890	U	144000	102.8		P
Cadmium	80 - 120	135000		175	J	144000	93.6		P
Calcium	80 - 120	36300000		30900000		14400000	37.5	N	P
Cobalt	80 - 120	150000		3810		144000	101.5		P
Copper	80 - 120	279000		29700		144000	173.1	N	P
Iron	80 - 120	50500000		10400000		14400000	278.5	N	P
Lead	80 - 120	146000		3940		144000	98.7		P
Magnesium	80 - 120	36000000		13000000		14400000	159.7	N	P
Manganese	80 - 120	814000		159000		144000	454.9	N	P
Mercury	-								NR
Nickel	80 - 120	166000		7150		144000	110.3		P
Potassium	80 - 120	22200000		3720000		14400000	128.3	N	P
Selenium	-								NR
Silver	75 - 120	58200		890	U	57700	100.9		P
Sodium	-								NR
Thallium	80 - 120	142000		1890	U	144000	98.6		P
Vanadium	80 - 120	275000		29400		144000	170.6	N	P
Zinc	80 - 120	229000		40400		144000	131	N	P

NQ MSD OK

NQ MSD OK

NQ MSD OK

NQ MSD OK

NQ MSD OK

NQ MSD OK

All recoveries in MSD were OK, so samples were not flagged based on spike recoveries.

Comments:

180311 1923

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SD014-0211MSD

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 18

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	23700000		8470000		14200000	107.3		P
Antimony	80 - 120	120000		1330	U	142000	84.5		P
Barium	80 - 120	420000		8210		425000	96.9		P
Beryllium	80 - 120	146000		890	U	142000	102.8		P
Cadmium	80 - 120	134000		175	J	142000	94.2		P
Calcium	80 - 120	46700000		30900000		14200000	111.3		P
Cobalt	80 - 120	140000		3810		142000	95.9		P
Copper	80 - 120	177000		29700		142000	103.7		P
Iron	80 - 120	23400000		10400000		14200000	91.5		P
Lead	80 - 120	144000		3940		142000	98.6		P
Magnesium	80 - 120	26100000		13000000		14200000	92.3		P
Manganese	80 - 120	275000		159000		142000	81.7		P
Mercury	-								NR
Nickel	80 - 120	148000		7150		142000	99.2		P
Potassium	80 - 120	17700000		3720000		14200000	98.5		P
Selenium	-								NR
Silver	75 - 120	56800		890	U	56700	100.2		P
Sodium	-								NR
Thallium	80 - 120	138000		1890	U	142000	97.2		P
Vanadium	80 - 120	184000		29400		142000	108.9		P
Zinc	80 - 120	182000		40400		142000	99.7		P

Comments:

180311 1923

396

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.

350200401A

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

SW023P

Matrix: Water Level:(low/med) LOW

Total

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Mercury	80 - 120	2.00		0.04	J	3	65.3		CV

Note-NQ

Comments:

180311 1923

391

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.

350200401A

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques/SWMU 6/402244.FI.

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: Water Level:(low/med) LOW

SW023P

Dissolved

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Mercury	80 - 120	2.05		0.03	U	3	68.4		CV

Note ~~NQ~~ J/UJ in SW23 T&D SW23P T&D

Comments:

180311 1924

		YES	NO	N/A
	as "UJ". If between 126-150%, flag (J) all data ≥ MDL as "J". If greater than 150%, reject (R) and red-line all associated data ≥ MDL.			
	(NOTE:Replace "N" with "J", "R" as appropriate.)			
A.1.17.5	**Soil/Sediment**			
	Are any spike recoveries:			
	(a) less than 10%?	___	[✓]	___
	(b) between 10-74%?	✓	[___]	___
	(c) between 126-200%?	✓	[___]	___
	(d) greater than 200%?	✓	[___]	___
	ACTION: If yes for any of the above, proceed as follows:			
	If the matrix spike recovery is less than 10%, reject (R) and red-line all associated data (detects & non-detects); if between 10-74%, qualify all associated data ≥ MDL as "J" and non-detects as "UJ"; if between 126-200%, flag (J) all associated data ≥ MDL as "J" If greater than 200%, reject (R) and red-line all associated data ≥ MDL. (NOTE:Replace "N" with "J" or "R" as appropriate.)			
A.1.18	**Lab Duplicates) - Form VI**			
A.1.18.1	Was the lab duplicate analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each matrix type?	[✓]	___	___
	For each concentration range (low or med.)?	[✓]	___	___
	For each analytical Method (ICP-AES/ICP-MS, Hg, CN) Used?	[___]	✓	___
	Was a lab duplicate prepared and analyzed with the SDG samples?	[✓]	___	___

Recoveries were out in MS but all were OK in MSD so samples weren't flagged- likely prep. issue OR matrix. Those that showed sig. RPD NC were flagged.

For ICP- only not Hg

		YES	NO	N/A
	ACTION: If no for any of the above, flag (J) as estimated all the SDG sample results (detects & non-detects) for which the lab duplicate analysis was not performed.			
	NOTE: If more than one lab duplicate sample were analyzed for an SDG, then qualify the associated samples based on the worst lab duplicate analysis.			
A.1.18.2	Was a Field Blank or PE sample used for the Lab Duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) all SDG sample results (hits & non-detects) for which Field Blank or PE sample was used for duplicate analysis.			
A.1.18.3	Circle on each Form VI all values that are:			
	RPD > 20%, or			
	Absolute Difference > CRQL			
	Are all values within control limits (RPD ≤ 20% or absolute difference ≤ ±CRQL)?	[✓]	___	___
	If no, are all results outside the control limits flagged with an "*" (Lab Qualifier) on Form VI and on all Form I's?	[___]	___	✓
	ACTION: If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.			
	NOTE: The laboratory is not required to report on Form VI the RPD when both values are non-detects.			
A.1.18.4	**Aqueous**			
A.1.18.4.1	When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			

U.S. EPA - CLP

6

DUPLICATES

EPA Sample No.

VWW06-SD014-0211MSD

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 18 % Solids for Duplicate: 18

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M	
Aluminum	20	35000000		23700000		38.5	*	P	JUJ
Antimony	20	108000		120000		10.5		P	
Barium	20	427000		420000		1.7		P	
Beryllium	20	148000		146000		1.4		P	
Cadmium	20	135000		134000		0.7		P	
Calcium	20	36300000		46700000		25.1	*	P	JUJ
Cobalt	20	150000		140000		6.9		P	
Copper	20	279000		177000		44.7	*	P	JUJ
Iron	20	50500000		23400000		73.3	*	P	JUJ
Lead	20	146000		144000		1.4		P	
Magnesium	20	36000000		26100000		31.9	*	P	JUJ
Manganese	20	814000		275000		99.0	*	P	JUJ
Nickel	20	166000		148000		11.5		P	
Potassium	20	22200000		17700000		22.6	*	P	JUJ
Silver	20	58200		56800		2.4		P	
Thallium	20	142000		138000		2.9		P	
Vanadium	20	275000		184000		39.7	*	P	JUJ
Zinc	20	229000		182000		22.9	*	P	JUJ

Comments:

180311 1923

	YES	NO	N/A
is any RPD > 20% but < 100%?	___	[___]	___ ✓
is any RPD ≥ 100%?	___	[___]	___ ✓

ACTION:
If the RPD is > 20% but < 100%, flag (J) as estimated the associated sample data ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line the associated sample data ≥ CRQL.

(NOTE:Replace "*" with "J" or "R" as appropriate.)

A.1.18.4.2 When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate values:

> ± CRQL?	___	[___]	___ ✓
> ± 2xCRQL?	___	[___]	___ ✓

ACTION:
If the absolute difference is > CRQL, flag as estimated all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 2xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but < 5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.18.5 **Soil/Sediment**

A.1.18.5.1 When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ ~~35%~~ 20% per SAP but < 120%?	✓	[___]	___
is any RPD ≥ 120%?	___	[___]	___ ✓

ACTION:
If the RPD is ≥ ~~35%~~ 20% per SAP and < 120%, flag (J) as estimated the associated sample

		YES	NO	N/A
	data ≥ CRQL. If the RPD is ≥ 120%, reject (R) and red-line the associated sample data ≥ CRQL.			
A.1.18.5.2	When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and duplicate:			
	> ± 2 x CRQL?	___	[___]	✓
	> ± 4 x CRQL	___	[___]	___

ACTION:
If the absolute difference is > 2 x CRQL, flag all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 4xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but <5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.19 Field Duplicates

Aqueous Field Duplicates

		YES	NO	N/A
A.1.19.1	Was an aqueous Field Duplicate pair collected and analyzed? (Check Sampling Trip Report)	[✓]	___	___

ACTION:
If yes, prepare a Form (Appendix A.4) for each aqueous Field Duplicate pair. Report the sample and Field Duplicate results on Appendix A.4 from their respective Form I's. Calculate and report RPD on Appendix A.4 when sample and its Field Duplicate values are both > 5xCRQL. Calculate and report the absolute difference on Appendix A.4 when at least one value (sample or duplicate) is <5xCRQL. Evaluate the aqueous Field Duplicate analysis in accordance with the

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SW023-0211
Duplicate Sample ID: VWW06-SW023P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
aluminum			#DIV/0!
barium	10.6	7.41	3.19
cadmium			0
calcium	438000	415000	5
cobalt			#DIV/0!
copper			#DIV/0!
iron			#DIV/0!
lead			#DIV/0!
magnesium	1350000	1270000	6
manganese			#DIV/0!
mercury			#DIV/0!
nickel			#DIV/0!
potassium	443000	419000	6
sodium	11400000	10500000	8
selenium	121	65.9	55.1
vanadium	5.78	8.8	-3.02
zinc			#DIV/0!
arsenic	50	33.5	16.5
copper	50	26	24
lead	20	11.9	8.1

COMMENTS: 20% RPD limit for all analytes >5X LOD; +/- 1X LOD if <5X LOD - J flag
100% RPD limit or +/- 2X LOD limit for R flag.

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SW023-0211
Duplicate Sample ID: VWW06-SW023P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
aluminum	640	586	54
barium	10.3	9.64	0.66
cadmium			0
calcium	425000	425000	0
cobalt			#DIV/0!
copper			#DIV/0!
iron	314	227	87
lead			#DIV/0!
magnesium	1300000	1320000	2
manganese			#DIV/0!
mercury	0.074	0.0405	0.0335
nickel			#DIV/0!
potassium	429000	430000	0
sodium	10800000	10800000	0
thallium			0
vanadium	4.5	5.46	-0.96
zinc			#DIV/0!
arsenic	20.1	36.1	-16
copper	24.4	50	-25.6
selenium			#DIV/0!

COMMENTS: 20% RPD limit for all analytes >5X LOD; +/- 1X LOD if <5X LOD - J flag
100% RPD limit or +/- 2X LOD limit for R flag.

YES NO N/A

QC criteria stated in Sections A.1.19.2 and A.1.19.3.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this the criteria to qualify the results.

A.1.19.2 Circle all values on the Form (Appendix A.4) for Field Duplicates that have:

RPD ≥ 20% or

Difference > ± CRQL

When sample and duplicate values are both ≥5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 20%? ___ [✓] ___

is any RPD ≥ 100%? ___ [✓] ___

ACTION:
If the RPD is >20% but < 100%, flag (J) only the associated sample and its Field Duplicate results ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line only the associated sample and its Field Duplicate result ≥ CRQL.

A.1.19.3 When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate:

> ± CRQL? ___ [✓] ___

> ± 2 x CRQL? ___ [✓] ___

ACTION:
If the absolute difference is > CRQL, flag detects ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the difference is > 2xCRQL, reject (R) and red-line non-detects

406

		YES	NO	N/A

and results ≥ MDL but <5xCRQL of the sample and its Field Duplicate.

Soil/Sediment Field Duplicates

A.1.19.4 Was a soil field duplicate pair collected and analyzed? (Check Sampling Trip Report) [___] ___ ✓

no soil FDs submitted

ACTION:
If yes, for each soil Field Duplicate pair proceed as follows:

Prepare Appendix A.4 for each Field Duplicate pair. Report on Appendix A.4 all sample and its Field Duplicate results in MG/KG from their respective Form I's. Calculate and report RPD when sample and its duplicate values are both greater than 5xCRQL. Calculate and report the absolute difference when at least one value (sample or duplicate) is < 5xCRQL. Evaluate the Field Duplicate analysis in accordance with the QC Criteria stated in Sections A.1.19.5 and A.1.19.6.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and apply the criteria to qualify the results.

A.1.19.5 Circle on each Appendix A.4 all values that have:

RPD ≥ 35%, or Difference > ± 2xCRQL When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%? ___ [___] ✓

is any RPD ≥ 120%? ___ [___] ✓

ACTION:
If the RPD is ≥ 35% but < 120%,

401

		YES	NO	N/A
	flag only the associated sample and its Field Duplicate results ≥ CRQL as "J". If the RPD is ≥ 120%, reject (R) and red-line only the sample and its Field Duplicate results ≥ CRQL.			
A.1.19.6	When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and Field Duplicate:			
	> ± 2 x CRQL?	___	[___]	___ ✓
	> ± 4 x CRQL?	___	[___]	___ ✓
	ACTION: If the absolute difference is > 2xCRQL, flag Sample and its Field Duplicate resuts ≥ MDL but <5xCRQL as "J" and non-detects as "UJ". If the difference is >4xCRQL, reject(R) and red-line non-detects and detects ≥ MDL but <5xCRQL of the sample and its Field Duplicate.			
A.1.20	**Laboratory Control Sample (LCS)- Form VII**			
A.1.20.1	Was one LCS prepared and analyzed for:			
	Each SDG?	[✓]	___	___
	Each matrix type?	[✓]	___	___
	Each batch samples digested/distilled?	[✓]	___	___
	For each Method(ICP-AES,ICP-MS,Hg,CN) used?	[✓]	___	___
	Was an LCS prepared and analyzed with the samples?	✓ [___]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log and contact CLP PO or TOPO for submittal of the LCS results. Flag (J) as estimated all the data for which an LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for			

	YES	NO	N/A

more than 20 samples, then the first 20 samples analyzed are not flagged(J), but all additional samples must be qualified (J).

A.1.20.2 Aqueous LCS

Circle on each Form VII the LCS percent recoveries outside control limits 80-120%.

NOTE: 1.Use digested ICV as LCS for aqueous mercury
2.Use distilled ICV as LCS for aqueous cyanide

Is any LCS recovery:

used lab QC limits

Less than 50%?	___	[___]	___
Between 50% and 79%?	___	[___]	___
Between 121% and 150%?	___	[___]	___
Greater than 150%?	___	[___]	___

ACTION:
If the LCS recovery is less than 50%, reject (R) and red-line all associated sample data (detects & non-detects); for a recovery between 50-79%, flag detects as "J" all non-detects as "UJ". if the LCS recovery is between 121-150%, flag only detects as "J". if the recovery is greater than 150%, reject (R) and red-line all detects.

A.1.20.3 Solid LCS

If an analyte's MDL is equal to or greater than the true value of LCS, disregard the "Action" below for that analyte even though the LCS is out of control limits.

Is the LCS "Found" value greater than the Upper Control Limit reported on Form VII?	___	[___]	___

ACTION:

		YES	NO	N/A
	If yes, flag (J) all the associated detects ≥ MDL as estimated (J).			
	Is the LCS "Found" value lower than the Lower Control Limit reported on Form VII?	___	[✓]	___
	ACTION: If yes, flag detects as "J" and non-dectes as "UJ".			
A.1.21	**ICP-AES/ICP-MS Serial Dilution - Form VIII** **NOTE:** Serial dilution analysis is required only when the initial concentration is equal to or greater than 50 x MDL.			
A.1.21.1	Was a Serial Dilution analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each matrix type?	[✓]	___	___
	For each concentration range (low or med.)?	[✓]	___	___
	Was a Serial Dilution sample analyzed with the SDG samples?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) detects ≥ MDL of all the SDG samples for which the ICP Serial Dilution Analysis was not performed.			
A.1.21.2	Was a Field Blank or PE sample used for the Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) detects ≥ MDL of all the SDG samples			
A.1.21.3	Circle on Form VIII the Percent Differences (%D) between sample results and its dilution results that are outside the control limits ± 10%			

U.S. EPA - CLP

9

SERIAL DILUTIONS

EPA Sample No.

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S 350200402L

SWD23

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: Water Level:(low/med) LOW

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M
Aluminum	639.66	J	1810.00	J	180	E	P
Barium	10.31	J	22.00	U			P
Beryllium	0.41	U	12.00	U			P
Calcium	424856.75		427000.00		0.50		P
Iron	314.26	J	366.00	J	16	E	P
Magnesium	1297416.40		1330000.00		2.5		P
Manganese	-29.57	U	35.00	U			P
Nickel	-20.15	U	93.00	U			P
Potassium	429032.80		407000.00		5.1		P
Selenium	35.12	U	218.00	J			P
Thallium	31.52	U	440.00	U			P
Vanadium	4.50	J	44.00	U			P
Zinc	27.73	U	400.00	U			P

JMJ R

JMJ

XI corr
JAC

Comments:

180311 1923

405

U.S. EPA - CLP

9

SERIAL DILUTIONS

EPA Sample No.

350200402L

SW023

Lab Name: PEL, Spectrum Analytical Contract: Vieques/SWMU 6/402244.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502004

Matrix: Water Level:(low/med) LOW

Dissolved

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M	
Aluminum	121.37	J	930.00	U			P	
Barium	10.65	J	44.50	J	320		P	
Beryllium	0.17	U	12.00	U			P	
Calcium	438316.55		2030000.00		360	E	P	R
Iron	-147.21	U	550.00	U			P	
Magnesium	1347617.64		6230000.00		360	E	P	R
Manganese	-35.72	U	35.00	U			P	
Nickel	-19.76	U	93.00	U			P	
Potassium	443377.81		2040000.00		360	E	P	R
Selenium	121.37		410.00	U			P	
Thallium	-2.80	U	440.00	U			P	
Vanadium	5.78	J	44.00	U			P	
Zinc	27.41	U	400.00	U			P	

Comments:

180311 1924

406

		YES	NO	N/A
	when initial concentrations ≥ 50 x MDLs.			
	Are results outside the control limits flagged with an "E"(Lab Qualifier) on Form VIII and all Form I's?	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/ Non-Compliance Section of the Data Review Narrative.			
A.1.21.4	Are any %D values:			
	> 10%?	✓	[___]	___
	≥ 100%?	✓	[___]	___
	ACTION: If the Percent Difference (%D) is greater than 10%, flag (J) as estimated all associated samples whose raw data ≥ MDL; if the %D is ≥ 100%, reject (R) and red-line all associated samples with raw data ≥ MDL.			
	(NOTE:Replace "E" with "J" or "R" as appropriate.)			
A.1.22	**Total/Dissolved or Inorganic/Total Analytes**			
A.1.22.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s)?	✓	[___]	___
	Were any analyses performed for inorganic as well as total analytes on the same sample(s)?	✗	[___]	✓
	ACTION: If yes, prepare a Form (Appendix A.5) to compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference on Appendix A.5 as a percent of the total analyte only when both of the following conditions are fulfilled: (1) The dissolved(or inorganic)concentration is greater than total concentration, and (2) greater than or equal to 5xMDL.			
A.1.22.2	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%?	___	[✓]	___

X1 corr JAC 41611

Total & Dissolved Analyte Concentrations

Per Region II validation SOP:

Note: Comparison between total and dissolved results is made only when both of the following conditions is met:

1. the dissolved concentration is greater than the total concentration, AND
2. the dissolved concentration is greater than or equal to 5X the LOD.

If %Difference is greater than 20% but less than 50% results are J, if >50% results are R.

Sample ID:	VWW06-SW023-0211	Duplicate Sample ID:	VWW06-SW023-0211
Analyte	**Total Conc.**	**Dissolved Conc.**	**%D**
calcium	425000	438000	3
magnesium	1300000	1350000	4
sodium	10800000	11400000	6
potassium	429000	443000	3
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID:	VWW06-SW022-0211	Duplicate Sample ID:	VWW06-SW022-0211
Analyte	**Total Conc.**	**Dissolved Conc.**	**%D**
calcium			#DIV/0!
magnesium	1300000	1310000	1
sodium			#DIV/0!
potassium			#DIV/0!
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID:	VWW06-SW021-0211	Duplicate Sample ID:	VWW06-SW021-0211
Analyte	**Total Conc.**	**Dissolved Conc.**	**%D**
calcium	427000	434000	2
magnesium	1310000	1350000	3
sodium	11000000	11100000	1
potassium	435000	448000	3
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID:	VWW06-SW019-0211	Duplicate Sample ID:	VWW06-SW019-0211
Analyte	**Total Conc.**	**Dissolved Conc.**	**%D**
calcium	424000	434000	2
magnesium	1320000	1340000	2
sodium			#DIV/0!
potassium	437000	447000	2
			#DIV/0!

Action: No action required - %D criteria were met.

Sample ID:	VWW06-SW020-0211	Duplicate Sample ID:	VWW06-SW020-0211
Analyte	**Total Conc.**	**Dissolved Conc.**	**%D**
calcium	410000	430000	5
magnesium	1290000	1360000	5
potassium	421000	443000	5
sodium	11100000	11300000	2
			#DIV/0!

Action: No action required - %D criteria were met.

		YES	NO	N/A
A.1.22.3	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 50%?	___	[___]	___

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) and red-line both the values.

A.1.23 **Field Blank - Form I**
NOTE: Designate "Field Blank" as such on Form I

A.1.23.1	Was a Field/Rinsate Bank collected and analyzed with the SDG samples?	[✓]	___	___
	If yes, is any Field/Rinsate Blank absolute value of an analyte on Form I greater than its CRQL (or 2xMDL when MDL>CRQL)?	___	[✓]	___
	If yes, circle the Field Blank value on Form I that is greater than the CRQL, (or 2 x MDL when MDL > CRQL).			
	Is any Field Blank value greater than CRQL also greater than the Preparation Blank value?	___	[✓]	___
	If yes, is the Field Blank value (> CRQL and > the prep. blank value) already rejected due to other QC criteria?	[___]	___	✓

ACTION:
If the Field Blank value was not rejected, reject all associated sample data (except the Field Blank results) greater than the CRQL but less than the Field Blank value. Reject on Form I's the soil sample results whose raw values in ug/L in the instrument printout are greater than the CRQL but less than the Field Blank value in ug/L. Flag as "J" detects between the Field Blank value and 10xField Blank value. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

If the Field Blank value is less than the

		YES	NO	N/A
	Prep.Blank value, do not qualify the sample results due to the Field Blank criteria.			

NOTE:
1. Field Blank result previously rejected due to other criteria cannot be used to qualify field samples.
2. Do not use Rinsate Blank associated with soils to qualify water samples and vice versa.

A.1.24 Verification of Instrumental Parameters - Form IX, XA, XB, XI

A.1.24.1	Is verification report present for:			
	Method Detection Limits (Form IX-Annually)?	[✓]	___	___
	ICP-AES Interelement Correction Factors (Form XA & XB -Quarterly)?	[✓]	___	___
	ICP-AES & ICP-MS Linear Ranges (Form XI-Quarterly)?	[✓]	___	___

ACTION:
If no, contact CLP PO/TOPO for submittal from the laboratory.

A.1.24.2 Method Detection Limits - Form IX

A.1.24.2.1	Are MDLs present on Form IX for:			
	All the analytes?	[✓]	___	___
	All the instruments used?	[✓]	___	___
	Digested and undigested samples and Calib.Blanks?	[✓]	___	___
	ICP-AES and ICP-MS when both instruments are used for the same analyte?	[✓]	___	___

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO/TOPO for submittal of the MDLs from the laboratory. Report to CLP PO and write in the Contract Problems/ Non-Compliance Section of the Data Review Narrative if the MDL concentration is not less than ½ CRQL.

		YES	NO	N/A
A.1.24.2.2	Is MDL greater than the CRQL for any analyte?	___	[✓]	___
	If yes, is the analyte concentration on Form I greater than 5 x MDL for the sample analyzed on the instrument whose MDL exceeds CRQL?	[___]	___	✓
	ACTION: If no, flag as estimated (J) all values less than five times MDL for the analyte whose MDL exceeds the CRQL.			
A.1.24.3	**Linear Ranges - Form XI**			
A.1.24.3.1	Was any sample result higher than the high linear range for ICP-AES or ICP-MS?	✓	[___]	___
	Was any sample result higher than the highest calibration standard for mercury or cyanide?	___	[✓]	___
	If yes for any of the above, was the sample diluted to obtain the result reported on Form I?	[✓]	___	___
	ACTION: If no, flag (J) as estimated the affected detects (≥ MDL) reported on Form I.			
A.1.25	**ICP-MS Tune Analysis - Form XIV**			
A.1.25.1	Was the ICP-MS instrument tuned prior to calibration?	[✓]	___	___
	ACTION: If no, reject (R) and red-line all sample data for which tuning was not performed.			
A.1.25.2	Was the tuning solution analyzed or scanned at least five times consecutively?	[✓]	___	___
	Were all the required isotopes spanning the analytical range present in the tuning solution?	[___]	___	___
	Was the mass resolution within			

	YES	NO	N/A
0.1 amu for each isotope in the tuning solution?	[✓]	___	___
Was %RSD less than 5% for each isotope of each analyte in the tuning solution?	[✓]	___	___

ACTION:
If no for any of the above, qualify all results ≥ MDL associated with that Tune as estimated "J", and all non-detects associated with that Tune as "UJ".

A.1.26 ICP-MS Internal Standards - Form XV

A.1.26.1 Were the Internal Standards added to all the samples and all QC samples and calibration standards (except the Tuning Solution)?	[✓]	___	___
Were all the target analyte masses bracketed by the masses of the five internal standards?	[✓]	___	___

ACTION:
If none of the Internal Standards was added to the samples, reject (R) and red-line all the associated sample data (detects & non-detects). If internal standards were used but did not cover all the analyte masses, reject (R) and red-line only the analyte results not bracketed by the internal standard masses.

A.1.26.2 Was the intensity of an Internal Standard in each sample within 60-125% of the intensity of the same Internal Standard in the calibration blank? (lab QC limits used)	[___]	___	✓
If no, was the original sample diluted two fold, Internal Standard added and the sample re-analyzed? (1:100 1:500 due to ↑ Na)	[✓]	___	___
Was the %RI for the two fold diluted sample within the acceptance limits (60-125%)?	[✓]	___	___

ACTION:
If no for any of the above, flag detects as "J" and non-detects "UJ" of all the analytes with atomic masses between the

atomic mass of the internal standard lighter

Results assoc with uncompliant IS in 1:100 were reported from 1:500. No Quals required.

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0215

ICP-MS Instrument ID: X1 Start Date: 02/22/2011 End Date: 02/22/2011

X1 110222A

EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
ZZZZZZ	1328	112		100		100		101		105		103	
CCV	1333	101		97		93		97		103		95	
CCB	1337	107		99		103		103		107		107	
ZZZZZZ	1342	107		100		101		103		107		104	
ZZZZZZ	1346	108		100		100		102		106		103	
ZZZZZZ	1350	106		100		100		101		104		101	
ZZZZZZ	1355	93		94		93		92		93		91	
ZZZZZZ	1359	101		97		97		97		99		97	
ZZZZZZ	1404	104		98		97		97		99		97	
ZZZZZZ	1408	104		94		97		97		99		100	
CCV	1413	95		93		89		92		96		89	
CCB	1417	100		96		99		98		99		100	
VWW06-SW023P-0211	1422	105		108		99		100		103		92	
ZZZZZZ	1426	111		113		102		103		104		93	
VWW06-SW023-0211	1431	115		119		107		106		107		95	
ZZZZZZ	1435	120		126	R	111		110		108		96	
VWW06-SW022-0211	1440	123	R	129	R	114		112		109		97	
ZZZZZZ	1444	125	R	132	R	117		113		110		98	
VWW06-SW021-0211	1449	126	R	135	R	118		114		110		98	
ZZZZZZ	1453	126	R	136	R	118		115		110		98	
CCV	1457	101		105		97		98		98		90	
CCB	1502	99		102		100		98		97		97	
VWW06-SW018-0211	1506	104		111		100		99		98		88	
ZZZZZZ	1511	108		118		104		102		98		89	
VWW06-SW019-0211	1515	108		118		105		101		96		88	
ZZZZZZ	1520	108		120		105		101		95		87	
VWW06-SW020-0211	1524	105		116		103		99		92		85	
ZZZZZZ	1528	103		116		101		97		90		83	
ZZZZZZ	1533	132		128		120		116		111		107	
CCV	1538	107		105		98		100		101		93	

1:100 NR See 1:500

1:100 NR See 1:500

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSISTY SUMMARY

Lab Name: Mitkem Laboratories Contract: 3502004

Lab Code: MITKEM Case No.: Mod. Ref. No.: SDG No.: SK0215-D

ICP-MS Instrument ID: X1 Start Date: 02/22/2011 End Date: 02/22/2011

X1 110222A

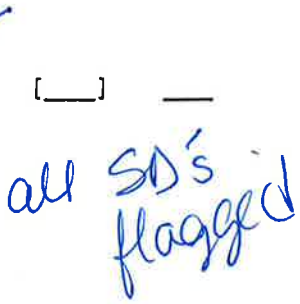
EPA Sample No.	Time	Internal Standatds %RI For: Element Li	Q	Element Sc	Q	Element Rh	Q	Element In	Q	Element Lu	Q	Element Bi	Q
VWW06-SW021-0211	1328	112		100		100		101		105		103	
CCV	1333	101		97		93		97		103		95	
CCB	1337	107		99		103		103		107		107	
ZZZZZZ	1342	107		100		101		103		107		104	
ZZZZZZ	1346	108		100		100		102		106		103	
ZZZZZZ	1350	106		100		100		101		104		101	
ZZZZZZ	1355	93		94		93		92		93		91	
ZZZZZZ	1359	101		97		97		97		99		97	
VWW06-SW020-0211L	1404	104		98		97		97		99		97	
ZZZZZZ	1408	104		94		97		97		99		100	
CCV	1413	95		93		89		92		96		89	
CCB	1417	100		96		99		98		99		100	
ZZZZZZ	1422	105		108		99		100		103		92	
VWW06-SW023P-0211	1426	111		113		102		103		104		93	
ZZZZZZ	1431	115		119		107		106		107		95	
1:100 VWW06-SW023-0211	1435	120		126	R	NQ See 1:500		110		108		96	
ZZZZZZ	1440	123	R	129	R	114		112		109		97	
1:100 VWW06-SW022-0211	1444	125	R	132	R	NQ See 1:500		113		110		98	
ZZZZZZ	1449	126	R	135	R	118		114		110		98	
1:100 VWW06-SW021-0211	1453	126	R	136	R	NQ See 1:500		115		110		98	
CCV	1457	101		105		97		98		98		90	
CCB	1502	99		102		100		98		97		97	
ZZZZZZ	1506	104		111		100		99		98		88	
VWW06-SW018-0211	1511	108		118		104		102		98		89	
ZZZZZZ	1515	108		118		105		101		96		88	
VWW06-SW019-0211	1520	108		120		105		101		95		87	
ZZZZZZ	1524	105		116		103		99		92		85	
VWW06-SW020-0211	1528	103		116		101		97		90		83	
ZZZZZZ	1533	132		128		120		116		111		107	
CCV	1538	107		105		98		100		101		93	

than the affected internal standard, and the atomic mass of the internal standard heavier than the affected internal standard.

A.1.27 Percent Solids of Sediments

A.1.27.1 Are percent solids in sediment(s):

< 50%? ___ [___] ___



ACTION:
If yes, qualify as estimated (J) all detects and non-detects of a sample that has percent solids less than 50%(i.e.,moisture content greater than 50%).

NOTE:
Flag(J) only the sample results that were not previously flagged due to other QC criteria.

Inorganic Data Review Narrative

Case# _____ Site: _____ Matrix: Soil ____

SDG# _____ Lab: _____ Water ____

Sampling Team: _____ Reviewer: _____ Other _____

A.2.1 Data Validation Flags:
The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as estimated

R and Red-Line - A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results ≥ MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully usable.

A.2.2 Laboratory Qualifiers:
The CLP laboratory applies a contractual qualifier on all

This SDG contains hexavalent chromium analysis using SW-846 7196A. Resubmissions were not required.

Laboratory: PEL

HOLDING TIMES

Sampling Date: 2/7-8/11
Received Date: 2/9/11
Analysis Dates: 2/9-10/11
Cooler temps: 1.4-3.1°C

All total and dissolved water samples exceeded the required 24 hour holding time by 4-25 hours; therefore results were qualified as estimated (J/UJ), with the exception of sample VWW06-SW018-0211 (total).

All results for soil samples listed below were flagged as estimated (J/UJ) due to sample containing 50-90% moisture, per Region II guidelines.

Sample ID	% Moisture
VWW06-SD001-0211	77
VWW06-SD002-0211	69
VWW06-SD014-0211	82
VWW06-SD015-0211	71.6
VWW06-SD016-0211	80.3
VWW06-SD014-0211	83.8

CALIBRATIONS

All initial calibration criteria were met. Calibration verification criteria were met for all ICV and CCV standards. No qualifications were required.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- Apply the same data validation guidelines to any associated calibration, preparation, and field QC blanks and all associated samples.
- Qualification/Action codes:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U at LOD	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD
R or J_+	The blank contaminant concentration was greater than the LOD and the sample result is greater than the LOD but less than 10X the blank contaminant concentration. The reported results are flagged either as rejected R or biased high J+ based on the professional judgment of the validator.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	RL (LOD)
VWW06-EB01-020811 (total)	hexavalent chromium		
VWW06-EB01-020811 (dissolved)	hexavalent chromium		

Sample ID	Analyte	Q Flag	Q Code
no qualifications required			

The concentration noted for the CCBs is the highest concentration in all the CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for noted CCB contamination. See worksheets for associations. Samples are qualified for field QC blank contamination based on QC tracking provided by CH2M HILL. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment.

LCS

All LCS recoveries and RPDs were acceptable.

MATRIX SPIKE/DUPLICATE SUMMARY

The MS / MSD pair was not submitted.

FIELD DUPLICATE SAMPLE SUMMARY

Note: Field duplicate results are assessed only if both results are above the CRDL.

Sample ID: **VWW06-SW023-0211 (total)** **Duplicate Sample ID:** **VWW06-SW023P-0211 (total)**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium	0.029	0.047	47%
			#DIV/0!
			#DIV/0!

Comments: No qualifications required.

Sample ID: **VWW06-SW023-0211 (dissolved)** **Duplicate Sample ID:** **VWW06-SW023P-0211 (dissolved)**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium	0.016	0.016	0%
			#DIV/0!
			#DIV/0!

Comments: No qualifications required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Detection limits were acceptable. Raw data was verified.

Reviewer _____ **Date:** 4/11/11

CH2M HILL
SWMU 6 CTO-111
SDG# 3502004

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: The following samples were analyzed out of hold: VWW06-EB01-020811, VWW06-SW018-0211, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, VWW06-SW023P-0211. The samples were received out of hold and were analyzed as soon as possible to get as close to the hold time as possible.

III. METHODS

Analyses were performed according to PEL Laboratory's Standard Operating Procedures and EPA Method 7196A.

IV. PREPARATION

There is no preparation step for this test.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

No spikes requested by client.

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

o

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: The following samples were analyzed out of hold: VWW06-EB01-020811, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, VWW06-SW023P-0211. The samples were received out of hold. The samples were analyzed as soon as possible to get as close to the holding times as possible.

III. METHODS

Analyses were performed according to PEL Laboratory's Standard Operating Procedures and EPA Method 7196A.

IV. PREPARATION

There is no preparation step for this test.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

No spikes requested by client.

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3502004

Client: CH2M Hill

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Samples:

Sample analysis proceeded normally.
Sample VWW06-SD015-0211 required a 10X dilution due to high concentration of the following analyte(s): Hexavalent Chromium.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/17/2011

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD020-0211

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): SOIL Lab Sample ID: K0225-05

Level (low/med): MED Date Received: 02/11/2011

% Solids: 22.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	2.6		J %SOL	MS	0.96	1.3	1.3
7440-47-3	Chromium	15.0		E	MS	0.36	1.3	2.6
7782-49-2	Selenium	1.9		B	MS	0.39	1.3	6.5

JAC 4/21/11

Comments:

JAC Resub 4/21/11

ISM_002 FORM I - IN SW846

044

0015

3502037

542

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VWW06-SD021-0211

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): SOIL Lab Sample ID: K0225-04

Level (low/med): MED Date Received: 02/11/2011

% Solids: 24.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	6.0		J %Sol	MS	1.0	1.4	1.4
7440-47-3	Chromium	14.1			MS	0.38	1.4	2.7
7782-49-2	Selenium	4.4			MS	0.41	1.4	6.8

JMC 4/21/11

Comments:

Repub 4/21/11 JMC

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SD022-0211

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): SOIL Lab Sample ID: K0225-03

Level (low/med): MED Date Received: 02/11/2011

% Solids: 22.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	6.2		J %Sd	MS	0.92	1.2	1.2
7440-47-3	Chromium	14.8		E	MS	0.35	1.2	2.5
7782-49-2	Selenium	2.6	B		MS	0.37	1.2	6.2

JMC 4/2/11

Comments:

Rerun JMC 4/2/11

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SD023-0211

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): SOIL Lab Sample ID: K0225-01

Level (low/med): MED Date Received: 02/11/2011

% Solids: 28.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	3.1		J %SOL	MS	0.81	1.1	1.1
7440-47-3	Chromium	15.0			MS	0.30	1.1	2.2
7782-49-2	Selenium	1.6	B		MS	0.33	1.1	5.4

JMC 4/21/11

Comments:

ISM_002

FORM I - IN

SW846

RPM 4/21/11 JMC 047

0019

3502037

545

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

April 18, 2011
SDG# 3502037, PEL; K0225, Mitkem
Vieques Island, Puerto Rico

Dear Ms. Weber,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 3502037/K0225. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, 8081B-Rev. 1.0, October 2006-SOP HW-44, 8082A- Rev 1, October 2006-SOP# HW-45, and ILM05.3-Rev. 13, September 2006-SOP #HW-2) and professional judgment. The SOP for the inorganic parameters (metals) is used but is modified as necessary to reflect the QC requirements of the site SAP. Region II has not developed a validation checklist SOP for the method used to assess hexavalent chromium in this SDG (SW-846 method 7196A). Alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	VOA	SVOA	Pest	PCB	Metal 6010	Metal 6020	Hg	Cr(VI)
VWW06-EB01-021011	350203710	water	X	X	X	X	X	X	X	X
VWW06-TB01-021011	350203711	water	X							
VWW06-SD023-0211	350203701	soil			X	X	X	X	X	X
VWW06-SD023P-0211	350203702	soil			X	X	X	X	X	X
VWW06-SD022-0211	350203703	soil			X	X	X	X	X	X
VWW06-SD021-0211	350203704	soil			X	X	X	X	X	X
VWW06-SD020-0211	350203705	soil			X	X	X	X	X	X
VWW06-SD019-0211	350203706	soil			X	X	X	X	X	X
VWW06-SD018-0211	350203707	soil			X	X	X	X	X	X
VWW06-SD018-0211 MS	350203707MS	soil			X	X	X	X	X	X
VWW06-SD018-0211 MSD	350203707MSD	soil			X	X	X	X	X	X

*Please note – the ID in the Lab ID column is the PEL Lab ID.

The following quality control samples were provided with this SDG: sample VWW06-EB01-021011- equipment blank; sample VWW06-TB01-021011- trip blank; and sample VWW06-SD023P-0211- field duplicate of sample VWW06-SD023P-0211.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times
- GC/MS Tuning *
- GC Performance *
- ICP MS Tuning *
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- LLQ Standards *
- Blanks
- Internal Standards *
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Serial Dilutions
- Field Duplicates
- Identification/Quantitation *
- Reporting Limits *
- Tentatively Identified Compounds NA

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. Please note that when a compound or analyte is flagged due to blank contamination the BL qualifier code takes precedence over all other qualifier codes except a code that explains rejected data.

All Fractions

All soil samples exhibited moisture levels >50%. Therefore all reported results in these samples were qualified as estimated.

VOA

No qualifications to the data were required.

SVOA

No qualifications to the data were required.

Pesticides

Two samples were re-extracted outside holding time due to a low surrogate recovery for TCX in each. The re-extracted analyses were excluded in favor of the results reported from the original extraction runs.

Two samples required qualification due to low surrogate recoveries.

PCBs

No additional qualifications were required.

Metals

Blank contamination was noted and qualification was required in one sample in this SDG.

The submitted MS/MSD pair exhibited some recoveries that were non-compliant. Qualifications to the data were required.

The serial dilution analysis exhibited one non-complaint %D. Results were qualified as estimated for the non-compliant analyte.

Hexavalent Chromium

One water sample analysis exceeded the required 24-hour holding time; therefore results were qualified as estimated.

All soil sample results were qualified as estimated due to high percent moisture content.

Non-comparable results were exhibited in the field duplicate pair, results were qualified as estimated.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the metals fractions. The low level quantitation standard summary data was not present in the data packages. Both PEL and Mitkem were notified and they submitted responses to the request. Copies of the responses are included in the validation worksheets section of this report.

Sample Condition

All Fractions

The following soil samples contained 50-90% water. Results were qualified as noted in the following table.

Sample ID	% Moisture	Qualifier	Q Code
VWW06-SD023-0211	72	J/UJ	%SOL
VWW06-SD023P-0211	71.2		
VWW06-SD022-0211	77.8		
VWW06-SD021-0211	76		
VWW06-SD020-0211	75.6		
VWW06-SD019-0211	74.6		
VWW06-SD018-0211	74.6		

Technical Holding Times

According to chain of custody records, sampling was performed on 2/8-10/11 and samples were received at PEL on 2/11/11 and at Mitkem on 2/15/11. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

Pesticides

Samples VWW06-SD019-0211 RE1 and VWW06-SD021-0211 RE1 were extracted outside of holding time due to surrogate recoveries that were low in the original extraction analysis. The RE samples are excluded in favor of the original analysis results due to exceeded holding times with a qualifier code of RE.

Hexavalent Chromium

Sample VWW06-EB01-021011 exceeded the required 24 hour holding time by 5 hours; therefore results were qualified as estimated (J/UJ), qualifier code: HT.

Blanks

Metals

Associated blanks exhibited contamination as noted in the following table.

Blank ID	Analyte	Concentration	Action Level	Q Flag
ICB X1_110223A	selenium	0.172J ug/L	LOD	U at LOD

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag
VWW06-SD018-0211	selenium	U at LOD

Surrogates

Pesticides

The following samples exhibited non-compliant recoveries for the surrogate listed in the table below; qualifications were applied as noted.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VWW06-SD019-0211	2,4,5,6-tetrachloro-m-xylene	61.5	70-125	J/UJ	SSL
VWW06-SD021-0211		58.6			

Matrix Spike Recoveries

Metals

The matrix spike pair submitted in this SDG exhibited non-compliant %R's for two analytes, requiring qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table. Please note that results were not qualified unless both recoveries were non-compliant. The post digest spike also exhibited low recovery for iron.

MS	Analytes	Samples	%R	Q Flag	Q Code
VWW06-SD018-0211	aluminum	all soil samples	128.4/148	J+	MSH
	antimony		38.2/39.2	J/UJ	MSL
	iron		65.7/71.6		
	manganese		72.8/66.7		

Serial Dilutions

Metals

The serial dilution submitted in this SDG exhibited a non-compliant %D for one analyte, requiring qualification in the field samples. A summary of this non-compliance and affected samples are noted in the following table.

SD	Analytes	Samples	%D	Q Flag	Q Code
VWW06-SD018-0211	chromium	all soil samples	15	J/UJ	SD

Field Duplicates

Hexavalent Chromium

Sample VWW06-SD023-0211 and field duplicate VWW06-SD023P-0211 exhibited 157% RPD for hexavalent chromium; therefore results were qualified as estimated (J), qualifier code: FD.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff
President

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag	Q Code
No qualifications required				

SVOA

Sample ID	Compound	Results	Q flag	Q Code
No qualifications required				

Pesticides

Sample ID	Compound	Results	Q flag	Q Code
all soil samples	all compounds	+/-	J/UJ	%SOL
VWW06-SD019-0211 RE1, VWW06-SD021-0211 RE1	all compounds	+/-	exclude	RE
VWW06-SD019-0211*, VWW06-SD021-0211*	all compounds	+/-	J/UJ	SSL

**qualified due to high percent moisture content; qualifier code %SOL*

PCBs

Sample ID	Compound	Results	Q flag	Q Code
all soil samples	all compounds	+/-	J/UJ	%SOL

Metals

Sample ID	Analyte	Results	Q flag	Q Code
all soil samples	all analytes	+/-	J/UJ	%SOL
VWW06-SD018-0211	selenium	+J	U at LOD	MBL
all soil samples*	aluminum	+	J	MSH
all soil samples*	antimony iron manganese	+/-	J/UJ	MSL
all soil samples*	chromium	+/-	J/UJ	SD

**qualified due to high percent moisture content; qualifier code %SOL except for analytes flagged U at LOD due to blank contamination. For these analytes the final qualifier code is MBL – but J is added to indicate estimation due to high %moisture levels.*

Hexavalent Chromium

Sample ID	Compound	Results	Q flag	Q Code
VWW06-EB01-021011	hexavalent chromium	+/-	J/UJ	HT
all soil samples	hexavalent chromium	+/-	J/UJ	%SOL
VWW06-SD023-0211, VWW06-SD023P-0211	hexavalent chromium*	+	J	FD

**qualified due to high percent moisture content*

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the FB result is less or greater than the RL.
R -	Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.
J -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

General Abbreviations

RL/LOD	reporting limit
PQL	practical quantitation limit
IDL	instrument detection limit
MDL	method detection limit
CRQL/LOQ	contract required quantitation limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-021011

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203710 Lab File ID: 03710.D

Sample wt/vol: 5 Units: ML Date Received: 02/11/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1534

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1.3	U	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	6.9	J	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.44	J	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-021011

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203710 Lab File ID: 03710.D

Sample wt/vol: 5 Units: ML Date Received: 02/11/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1534

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-021011

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203711 Lab File ID: 03711.D

Sample wt/vol: 5 Units: ML Date Received: 02/11/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1557

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
75-71-8	Dichlorodifluoromethane	0.34	U	0.17	0.34	1
74-87-3	Chloromethane	0.64	U	0.32	0.64	1
75-01-4	Vinyl chloride	0.36	U	0.18	0.36	1
74-83-9	Bromomethane	0.86	U	0.43	0.86	1
75-00-3	Chloroethane	1	U	0.72	1	1
75-69-4	Trichlorofluoromethane	0.24	U	0.12	0.24	1
75-35-4	1,1-Dichloroethene	0.38	U	0.19	0.38	0.5
75-15-0	Carbon disulfide	0.38	U	0.19	0.38	1
75-09-2	Methylene chloride	1	J	0.66	1.3	5
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.33	0.5	0.5
75-34-3	1,1-Dichloroethane	0.3	U	0.15	0.3	1
67-64-1	Acetone	3.9	J	1.3	2.6	10
156-59-2	cis-1,2-Dichloroethene	0.38	U	0.19	0.38	0.5
74-97-5	Bromochloromethane	0.34	U	0.17	0.34	1
78-93-3	2-Butanone	4	U	2	4	4
67-66-3	Chloroform	0.32	U	0.16	0.32	0.5
71-55-6	1,1,1-Trichloroethane	0.28	U	0.14	0.28	1
56-23-5	Carbon tetrachloride	0.28	U	0.14	0.28	0.5
71-43-2	Benzene	0.34	U	0.17	0.34	0.5
107-06-2	1,2-Dichloroethane	0.3	U	0.15	0.3	0.5
79-01-6	Trichloroethene	0.38	U	0.19	0.38	0.5
78-87-5	1,2-Dichloropropane	0.3	U	0.15	0.3	1
75-27-4	Bromodichloromethane	0.3	U	0.15	0.3	0.5
10061-01-5	cis-1,3-Dichloropropene	0.24	U	0.12	0.24	0.5
108-10-1	4-Methyl-2-pentanone	2	U	1	2	4
108-88-3	Toluene	0.28	U	0.14	0.28	1

VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-TB01-021011

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203711 Lab File ID: 03711.D

Sample wt/vol: 5 Units: ML Date Received: 02/11/11

Concentrated Extract Volume: 5 Date Extracted:

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1557

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: PURGETRAP Station ID: Method: 8260

GPC Cleanup : (Y/N) pH:

Column(1): DB-624 ID: 0.18 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
10061-02-6	trans-1,3-Dichloropropene	0.6	U	0.3	0.6	1
79-00-5	1,1,2-Trichloroethane	0.4	U	0.2	0.4	1
127-18-4	Tetrachloroethene	0.42	U	0.21	0.42	0.5
591-78-6	2-Hexanone	0.96	U	0.48	0.96	4
124-48-1	Dibromochloromethane	0.26	U	0.13	0.26	0.5
106-93-4	1,2-Dibromoethane(EDB)	0.22	U	0.11	0.22	1
108-90-7	Chlorobenzene	0.32	U	0.16	0.32	0.5
100-41-4	Ethylbenzene	0.44	U	0.22	0.44	0.5
100-42-5	Styrene	0.24	U	0.12	0.24	1
75-25-2	Bromoform	0.38	U	0.19	0.38	1
98-82-8	Isopropylbenzene (Cumene)	0.28	U	0.14	0.28	1
79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	0.13	0.26	1
541-73-1	1,3-Dichlorobenzene	0.3	U	0.15	0.3	2
106-46-7	1,4-Dichlorobenzene	0.3	U	0.15	0.3	3
95-50-1	1,2-Dichlorobenzene	0.5	U	0.25	0.5	2
96-12-8	1,2-Dibromo-3-chloropropane	2	U	1	2	2
120-82-1	1,2,4-Trichlorobenzene	0.22	U	0.11	0.22	2
87-61-6	1,2,3-Trichlorobenzene	0.32	U	0.16	0.32	2
1330-20-7	Xylene (total)	1	U	0.5	1	2
1634-04-4	MTBE	1	U	0.5	1	1
76-13-1	1,1,2-Trichlorotrifluoroethane	0.46	U	0.23	0.46	1
108-87-2	Methyl Cyclohexane	0.54	U	0.27	0.54	1
79-20-9	Methyl Acetate	0.76	U	0.38	0.76	1
110-82-7	Cyclohexane	0.4	U	0.2	0.4	1

SEMI-VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-021011

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203710 Lab File ID: 03710.D

Sample wt/vol: 975 Units: ML Date Received: 02/11/11

Concentrated Extract Volume: 1 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/18/11 Time: 0657

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8270 SIM

GPC Cleanup : (Y/N) N pH:

Column(1): HPMS-5 ID: 0.25 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
90-12-0	1-Methylnaphthalene	0.041	U	0.02	0.041	0.051
91-57-6	2-Methylnaphthalene	0.041	U	0.02	0.041	0.051
83-32-9	Acenaphthene	0.041	U	0.02	0.041	0.051
208-96-8	Acenaphthylene	0.041	U	0.02	0.041	0.051
120-12-7	Anthracene	0.041	U	0.02	0.041	0.051
56-55-3	Benzo(a)anthracene	0.041	U	0.02	0.041	0.051
50-32-8	Benzo(a)pyrene	0.041	U	0.02	0.041	0.051
205-99-2	Benzo(b)fluoranthene	0.041	U	0.02	0.041	0.051
191-24-2	Benzo(g,h,i)perylene	0.041	U	0.02	0.041	0.051
207-08-9	Benzo(k)fluoranthene	0.041	U	0.02	0.041	0.051
218-01-9	Chrysene	0.041	U	0.02	0.041	0.051
53-70-3	Dibenzo(a,h)anthracene	0.041	U	0.02	0.041	0.051
206-44-0	Fluoranthene	0.041	U	0.02	0.041	0.051
86-73-7	Fluorene	0.041	U	0.02	0.041	0.051
193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	0.02	0.041	0.051
91-20-3	Naphthalene	0.041	U	0.02	0.041	0.051
85-01-8	Phenanthrene	0.041	U	0.02	0.041	0.051
129-00-0	Pyrene	0.041	U	0.02	0.041	0.051

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD023-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203701 Lab File ID: 37-01.D

Sample wt/vol: 33.73 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1853

PercentSolids: 28 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	5.2	UJ	3.4	5.2	5.2
319-85-7	beta-BHC	1	U	0.52	1	5.2
319-86-8	delta-BHC	2	U	0.98	2	5.2
58-89-9	gamma-BHC (Lindane)	1.4	U	0.7	1.4	5.2
76-44-8	Heptachlor	1.4	U	0.7	1.4	5.2
309-00-2	Aldrin	1	U	0.52	1	5.2
1024-57-3	Heptachlor epoxide	1	U	0.52	1	5.2
959-98-8	Endosulfan I	1.5	U	0.77	1.5	5.2
60-57-1	Dieldrin	1.1	U	0.56	1.1	5.2
72-55-9	4,4'-DDE	1.9	U	0.94	1.9	5.2
72-20-8	Endrin	1.8	U	0.91	1.8	5.2
33213-65-9	Endosulfan II	2	U	1	2	5.2
72-54-8	4,4'-DDD	3.6	U	1.8	3.6	5.2
1031-07-8	Endosulfan sulfate	1.4	U	0.7	1.4	5.2
50-29-3	4,4'-DDT	2.6	U	1.3	2.6	5.2
72-43-5	Methoxychlor	1.9	U	0.94	1.9	5.2
7421-93-4	Endrin aldehyde	2.5	U	1.2	2.5	5.2
5103-74-2	gamma-Chlordane	1.2	U	0.59	1.2	5.2
5103-71-9	alpha-Chlordane	1.1	U	0.56	1.1	5.2
53494-70-5	Endrin ketone	1.5	U	0.73	1.5	5.2
8001-35-2	Toxaphene	170	U	120	170	170

%Sol

JAC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD023P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203702 Lab File ID: 37-02.D

Sample wt/vol: 33.62 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1911

PercentSolids: 28.8 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	5.1	U	3.3	5.1	5.1
319-85-7	beta-BHC	1	U	0.51	1	5.1
319-86-8	delta-BHC	1.9	U	0.95	1.9	5.1
58-89-9	gamma-BHC (Lindane)	1.4	U	0.68	1.4	5.1
76-44-8	Heptachlor	1.4	U	0.68	1.4	5.1
309-00-2	Aldrin	1	U	0.51	1	5.1
1024-57-3	Heptachlor epoxide	1	U	0.51	1	5.1
959-98-8	Endosulfan I	1.5	U	0.75	1.5	5.1
60-57-1	Dieldrin	1.1	U	0.55	1.1	5.1
72-55-9	4,4'-DDE	1.8	U	0.92	1.8	5.1
72-20-8	Endrin	1.8	U	0.89	1.8	5.1
33213-65-9	Endosulfan II	2	U	0.99	2	5.1
72-54-8	4,4'-DDD	3.5	U	1.7	3.5	5.1
1031-07-8	Endosulfan sulfate	1.4	U	0.68	1.4	5.1
50-29-3	4,4'-DDT	2.6	U	1.3	2.6	5.1
72-43-5	Methoxychlor	1.8	U	0.92	1.8	5.1
7421-93-4	Endrin aldehyde	2.4	U	1.2	2.4	5.1
5103-74-2	gamma-Chlordane	1.2	U	0.58	1.2	5.1
5103-71-9	alpha-Chlordane	1.1	U	0.55	1.1	5.1
53494-70-5	Endrin ketone	1.4	U	0.72	1.4	5.1
8001-35-2	Toxaphene	170	U	110	170	170

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD022-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203703 Lab File ID: 37-03.D

Sample wt/vol: 33.51 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1928

PercentSolids: 22.2 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	6.6	WJ U 25d	4.2	6.6	6.6
319-85-7	beta-BHC	1.3	U	0.66	1.3	6.6
319-86-8	delta-BHC	2.5	U	1.2	2.5	6.6
58-89-9	gamma-BHC (Lindane)	1.8	U	0.89	1.8	6.6
76-44-8	Heptachlor	1.8	U	0.89	1.8	6.6
309-00-2	Aldrin	1.3	U	0.66	1.3	6.6
1024-57-3	Heptachlor epoxide	1.3	U	0.66	1.3	6.6
959-98-8	Endosulfan I	2	U	0.98	2	6.6
60-57-1	Dieldrin	1.4	U	0.71	1.4	6.6
72-55-9	4,4'-DDE	2.4	U	1.2	2.4	6.6
72-20-8	Endrin	2.3	U	1.2	2.3	6.6
33213-65-9	Endosulfan II	2.6	U	1.3	2.6	6.6
72-54-8	4,4'-DDD	4.5	U	2.3	4.5	6.6
1031-07-8	Endosulfan sulfate	1.8	U	0.89	1.8	6.6
50-29-3	4,4'-DDT	3.4	U	1.7	3.4	6.6
72-43-5	Methoxychlor	2.4	U	1.2	2.4	6.6
7421-93-4	Endrin aldehyde	3.2	U	1.6	3.2	6.6
5103-74-2	gamma-Chlordane	1.5	U	0.75	1.5	6.6
5103-71-9	alpha-Chlordane	1.4	U	0.71	1.4	6.6
53494-70-5	Endrin ketone	1.9	U	0.93	1.9	6.6
8001-35-2	Toxaphene	220	U	150	220	220

JC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD021-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203704 Lab File ID: 37-04.D

Sample wt/vol: 33.43 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 1946

PercentSolids: 24 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	6.2	UJ U %Sol	3.9	6.2	6.2
319-85-7	beta-BHC	1.2	U	0.62	1.2	6.2
319-86-8	delta-BHC	2.3	U	1.2	2.3	6.2
58-89-9	gamma-BHC (Lindane)	1.6	U	0.82	1.6	6.2
76-44-8	Heptachlor	1.6	U	0.82	1.6	6.2
309-00-2	Aldrin	1.2	U	0.62	1.2	6.2
1024-57-3	Heptachlor epoxide	1.2	U	0.62	1.2	6.2
959-98-8	Endosulfan I	1.8	U	0.9	1.8	6.2
60-57-1	Dieldrin	1.3	U	0.66	1.3	6.2
72-55-9	4,4'-DDE	2.2	U	1.1	2.2	6.2
72-20-8	Endrin	2.1	U	1.1	2.1	6.2
33213-65-9	Endosulfan II	2.4	U	1.2	2.4	6.2
72-54-8	4,4'-DDD	4.2	U	2.1	4.2	6.2
1031-07-8	Endosulfan sulfate	1.6	U	0.82	1.6	6.2
50-29-3	4,4'-DDT	3.1	U	1.6	3.1	6.2
72-43-5	Methoxychlor	2.2	U	1.1	2.2	6.2
7421-93-4	Endrin aldehyde	3	U	1.5	3	6.2
5103-74-2	gamma-Chlordane	1.4	U	0.7	1.4	6.2
5103-71-9	alpha-Chlordane	1.3	U	0.66	1.3	6.2
53494-70-5	Endrin ketone	1.7	U	0.86	1.7	6.2
8001-35-2	Toxaphene	200	U	140	200	200

JJC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

180311 1805

Form I

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD021-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203704RE1 Lab File ID: 37-04.D

Sample wt/vol: 33.21 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/25/11

Level:(low/med) LOW Date Analyzed: 03/01/11 Time: 1125

PercentSolids: 24 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	6.2 exclude	U RE	4	6.2	6.2
319-85-7	beta-BHC	1.2	U	0.62	1.2	6.2
319-86-8	delta-BHC	2.3	U	1.2	2.3	6.2
58-89-9	gamma-BHC (Lindane)	1.6	U	0.83	1.6	6.2
76-44-8	Heptachlor	1.6	U	0.83	1.6	6.2
309-00-2	Aldrin	1.2	U	0.62	1.2	6.2
1024-57-3	Heptachlor epoxide	1.2	U	0.62	1.2	6.2
959-98-8	Endosulfan I	1.8	U	0.91	1.8	6.2
60-57-1	Dieldrin	1.3	U	0.66	1.3	6.2
72-55-9	4,4'-DDE	2.2	U	1.1	2.2	6.2
72-20-8	Endrin	2.2	U	1.1	2.2	6.2
33213-65-9	Endosulfan II	2.4	U	1.2	2.4	6.2
72-54-8	4,4'-DDD	4.2	U	2.1	4.2	6.2
1031-07-8	Endosulfan sulfate	1.6	U	0.83	1.6	6.2
50-29-3	4,4'-DDT	3.1	U	1.6	3.1	6.2
72-43-5	Methoxychlor	2.2	U	1.1	2.2	6.2
7421-93-4	Endrin aldehyde	3	U	1.5	3	6.2
5103-74-2	gamma-Chlordane	1.4	U	0.7	1.4	6.2
5103-71-9	alpha-Chlordane	1.3	U	0.66	1.3	6.2
53494-70-5	Endrin ketone	1.7	U	0.87	1.7	6.2
8001-35-2	Toxaphene	210	U	140	210	210

JC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD020-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203705 Lab File ID: 37-05.D

Sample wt/vol: 33.91 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 2004

PercentSolids: 24.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	6	UJ U %Sol	3.8	6	6
319-85-7	beta-BHC	1.2	U	0.6	1.2	6
319-86-8	delta-BHC	2.2	U	1.1	2.2	6
58-89-9	gamma-BHC (Lindane)	1.6	U	0.8	1.6	6
76-44-8	Heptachlor	1.6	U	0.8	1.6	6
309-00-2	Aldrin	1.2	U	0.6	1.2	6
1024-57-3	Heptachlor epoxide	1.2	U	0.6	1.2	6
959-98-8	Endosulfan I	1.8	U	0.88	1.8	6
60-57-1	Dieldrin	1.3	U	0.64	1.3	6
72-55-9	4,4'-DDE	2.2	U	1.1	2.2	6
72-20-8	Endrin	2.1	U	1	2.1	6
33213-65-9	Endosulfan II	2.3	U	1.2	2.3	6
72-54-8	4,4'-DDD	4.1	U	2	4.1	6
1031-07-8	Endosulfan sulfate	1.6	U	0.8	1.6	6
50-29-3	4,4'-DDT	3	U	1.5	3	6
72-43-5	Methoxychlor	2.2	U	1.1	2.2	6
7421-93-4	Endrin aldehyde	2.9	U	1.4	2.9	6
5103-74-2	gamma-Chlordane	1.4	U	0.68	1.4	6
5103-71-9	alpha-Chlordane	1.3	U	0.64	1.3	6
53494-70-5	Endrin ketone	1.7	U	0.84	1.7	6
8001-35-2	Toxaphene	200	U	130	200	200

4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD019-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203706 Lab File ID: 37-06.D

Sample wt/vol: 33.69 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 2022

PercentSolids: 25.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	5.8	UJ	3.7	5.8	5.8
319-85-7	beta-BHC	1.2	U	0.58	1.2	5.8
319-86-8	delta-BHC	2.2	U	1.1	2.2	5.8
58-89-9	gamma-BHC (Lindane)	1.5	U	0.77	1.5	5.8
76-44-8	Heptachlor	1.5	U	0.77	1.5	5.8
309-00-2	Aldrin	1.2	U	0.58	1.2	5.8
1024-57-3	Heptachlor epoxide	1.2	U	0.58	1.2	5.8
959-98-8	Endosulfan I	1.7	U	0.85	1.7	5.8
60-57-1	Dieldrin	1.2	U	0.62	1.2	5.8
72-55-9	4,4'-DDE	2.1	U	1	2.1	5.8
72-20-8	Endrin	2	U	1	2	5.8
33213-65-9	Endosulfan II	2.2	U	1.1	2.2	5.8
72-54-8	4,4'-DDD	3.9	U	2	3.9	5.8
1031-07-8	Endosulfan sulfate	1.5	U	0.77	1.5	5.8
50-29-3	4,4'-DDT	2.9	U	1.5	2.9	5.8
72-43-5	Methoxychlor	2.1	U	1	2.1	5.8
7421-93-4	Endrin aldehyde	2.8	U	1.4	2.8	5.8
5103-74-2	gamma-Chlordane	1.3	U	0.66	1.3	5.8
5103-71-9	alpha-Chlordane	1.2	U	0.62	1.2	5.8
53494-70-5	Endrin ketone	1.6	U	0.81	1.6	5.8
8001-35-2	Toxaphene	190	U	130	190	190

JC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD019-0211RE1

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203706RE1 Lab File ID: 37-06.D

Sample wt/vol: 33.58 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/25/11

Level:(low/med) LOW Date Analyzed: 03/01/11 Time: 1143

PercentSolids: 25.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	RESULT	Q	MDL	LOD	LOQ
319-84-6	alpha-BHC	5.8	U	3.7	5.8	5.8
319-85-7	beta-BHC	1.2	U	0.58	1.2	5.8
319-86-8	delta-BHC	2.2	U	1.1	2.2	5.8
58-89-9	gamma-BHC (Lindane)	1.5	U	0.77	1.5	5.8
76-44-8	Heptachlor	1.5	U	0.77	1.5	5.8
309-00-2	Aldrin	1.2	U	0.58	1.2	5.8
1024-57-3	Heptachlor epoxide	1.2	U	0.58	1.2	5.8
959-98-8	Endosulfan I	1.7	U	0.85	1.7	5.8
60-57-1	Dieldrin	1.2	U	0.62	1.2	5.8
72-55-9	4,4'-DDE	2.1	U	1	2.1	5.8
72-20-8	Endrin	2	U	1	2	5.8
33213-65-9	Endosulfan II	2.2	U	1.1	2.2	5.8
72-54-8	4,4'-DDD	3.9	U	2	3.9	5.8
1031-07-8	Endosulfan sulfate	1.5	U	0.77	1.5	5.8
50-29-3	4,4'-DDT	2.9	U	1.5	2.9	5.8
72-43-5	Methoxychlor	2.1	U	1	2.1	5.8
7421-93-4	Endrin aldehyde	2.8	U	1.4	2.8	5.8
5103-74-2	gamma-Chlordane	1.3	U	0.66	1.3	5.8
5103-71-9	alpha-Chlordane	1.2	U	0.62	1.2	5.8
53494-70-5	Endrin ketone	1.6	U	0.81	1.6	5.8
8001-35-2	Toxaphene	190	U	130	190	190

exclude Q RE

JC 4/14/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD018-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203707 Lab File ID: 37-07.D

Sample wt/vol: 33.7 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/23/11 Time: 2039

PercentSolids: 25.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	5.8	UJ (%D)	3.7	5.8	5.8
319-85-7	beta-BHC	1.2	U	0.58	1.2	5.8
319-86-8	delta-BHC	2.2	U	1.1	2.2	5.8
58-89-9	gamma-BHC (Lindane)	1.5	U	0.77	1.5	5.8
76-44-8	Heptachlor	1.5	U	0.77	1.5	5.8
309-00-2	Aldrin	1.2	U	0.58	1.2	5.8
1024-57-3	Heptachlor epoxide	1.2	U	0.58	1.2	5.8
959-98-8	Endosulfan I	1.7	U	0.85	1.7	5.8
60-57-1	Dieldrin	1.2	U	0.62	1.2	5.8
72-55-9	4,4'-DDE	2.1	U	1	2.1	5.8
72-20-8	Endrin	2	U	1	2	5.8
33213-65-9	Endosulfan II	2.2	U	1.1	2.2	5.8
72-54-8	4,4'-DDD	3.9	U	2	3.9	5.8
1031-07-8	Endosulfan sulfate	1.5	U	0.77	1.5	5.8
50-29-3	4,4'-DDT	2.9	U	1.5	2.9	5.8
72-43-5	Methoxychlor	2.1	U	1	2.1	5.8
7421-93-4	Endrin aldehyde	2.8	U	1.4	2.8	5.8
5103-74-2	gamma-Chlordane	1.3	U	0.66	1.3	5.8
5103-71-9	alpha-Chlordane	1.2	U	0.62	1.2	5.8
53494-70-5	Endrin ketone	1.6	U	0.81	1.6	5.8
8001-35-2	Toxaphene	190	U	130	190	190

JC 4/14/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PESTICIDE ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-021011

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203710 Lab File ID: 37-01.D

Sample wt/vol: 975 Units: ML Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/15/11

Level:(low/med) LOW Date Analyzed: 02/19/11 Time: 0013

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8081

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
319-84-6	alpha-BHC	0.0062	U	0.0031	0.0062	0.051
319-85-7	beta-BHC	0.0025	U	0.0012	0.0025	0.051
319-86-8	delta-BHC	0.0062	U	0.0031	0.0062	0.051
58-89-9	gamma-BHC (Lindane)	0.0049	U	0.0025	0.0049	0.051
76-44-8	Heptachlor	0.0081	U	0.0041	0.0081	0.051
309-00-2	Aldrin	0.0033	U	0.0016	0.0033	0.051
1024-57-3	Heptachlor epoxide	0.0029	U	0.0014	0.0029	0.051
959-98-8	Endosulfan I	0.0088	U	0.0044	0.0088	0.051
60-57-1	Dieldrin	0.0055	U	0.0028	0.0055	0.051
72-55-9	4,4'-DDE	0.0078	U	0.0039	0.0078	0.051
72-20-8	Endrin	0.0037	U	0.0018	0.0037	0.051
33213-65-9	Endosulfan II	0.0033	U	0.0016	0.0033	0.051
72-54-8	4,4'-DDD	0.0053	U	0.0027	0.0053	0.051
1031-07-8	Endosulfan sulfate	0.002	U	0.001	0.002	0.051
50-29-3	4,4'-DDT	0.0022	U	0.0011	0.0022	0.051
72-43-5	Methoxychlor	0.0037	U	0.0018	0.0037	0.051
7421-93-4	Endrin aldehyde	0.0031	U	0.0015	0.0031	0.051
5103-74-2	gamma-Chlordane	0.0049	U	0.0025	0.0049	0.051
5103-71-9	alpha-Chlordane	0.0062	U	0.0031	0.0062	0.051
53494-70-5	Endrin ketone	0.012	U	0.0062	0.012	0.051
8001-35-2	Toxaphene	0.37	U	0.18	0.37	0.51

JAC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD023-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203701 Lab File ID: 37-01.D

Sample wt/vol: 33.73 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/12/11 Time: 0023

PercentSolids: 28 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	55 UJ 250	U	28	55	64
11096-82-5	Aroclor-1260	26	U	13	26	64
11104-28-2	Aroclor-1221	51	U	25	51	64
11141-16-5	Aroclor-1232	64	U	42	64	64
53469-21-9	Aroclor-1242	46	U	23	46	64
12672-29-6	Aroclor-1248	46	U	23	46	64
11097-69-1	Aroclor-1254	40	U	20	40	64

JAC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD023P-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203702 Lab File ID: 37-02.D

Sample wt/vol: 33.62 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/12/11 Time: 0038

PercentSolids: 28.8 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	54	UJ	27	54	62
11096-82-5	Aroclor-1260	25	U	13	25	62
11104-28-2	Aroclor-1221	50	U	25	50	62
11141-16-5	Aroclor-1232	62	U	41	62	62
53469-21-9	Aroclor-1242	45	U	23	45	62
12672-29-6	Aroclor-1248	45	U	23	45	62
11097-69-1	Aroclor-1254	39	U	20	39	62

UJ %Sol

4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD022-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203703 Lab File ID: 37-03.D

Sample wt/vol: 33.51 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/12/11 Time: 0053

PercentSolids: 22.2 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	70 UJ X61	U	35	70	81
11096-82-5	Aroclor-1260	33	U	16	33	81
11104-28-2	Aroclor-1221	64	U	32	64	81
11141-16-5	Aroclor-1232	81	U	54	81	81
53469-21-9	Aroclor-1242	59	U	30	59	81
12672-29-6	Aroclor-1248	59	U	30	59	81
11097-69-1	Aroclor-1254	51	U	26	51	81

JPC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD021-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203704 Lab File ID: 37-04.D

Sample wt/vol: 33.43 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/14/11 Time: 1344

PercentSolids: 24 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	65 UJ %Sol	U	32	65	75
11096-82-5	Aroclor-1260	30	U	15	30	75
11104-28-2	Aroclor-1221	60	U	30	60	75
11141-16-5	Aroclor-1232	75	U	50	75	75
53469-21-9	Aroclor-1242	55	U	27	55	75
12672-29-6	Aroclor-1248	55	U	27	55	75
11097-69-1	Aroclor-1254	47	U	24	47	75

JC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD020-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203705 Lab File ID: 37-05.D

Sample wt/vol: 33.91 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/12/11 Time: 0124

PercentSolids: 24.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	63	UJ %Sol U	31	63	72
11096-82-5	Aroclor-1260	29	U	15	29	72
11104-28-2	Aroclor-1221	58	U	29	58	72
11141-16-5	Aroclor-1232	72	U	48	72	72
53469-21-9	Aroclor-1242	53	U	26	53	72
12672-29-6	Aroclor-1248	53	U	26	53	72
11097-69-1	Aroclor-1254	46	U	23	46	72

JAC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD019-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203706 Lab File ID: 37-06.D

Sample wt/vol: 33.69 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/12/11 Time: 0139

PercentSolids: 25.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	61 UJ %Sol	U	30	61	70
11096-82-5	Aroclor-1260	28	U	14	28	70
11104-28-2	Aroclor-1221	56	U	28	56	70
11141-16-5	Aroclor-1232	70	U	47	70	70
53469-21-9	Aroclor-1242	51	U	26	51	70
12672-29-6	Aroclor-1248	51	U	26	51	70
11097-69-1	Aroclor-1254	44	U	22	44	70

JC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD018-0211

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203707 Lab File ID: 37-07.D

Sample wt/vol: 33.7 Units: G Date Received: 02/11/11

Concentrated Extract Volume: 10 Date Extracted: 02/11/11

Level:(low/med) LOW Date Analyzed: 02/12/11 Time: 0154

PercentSolids: 25.4 decanted : Dilution Factor: 1

Extraction: SONC Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/KG

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	61 UJ %Sol	U	30	61	70
11096-82-5	Aroclor-1260	28	U	14	28	70
11104-28-2	Aroclor-1221	56	U	28	56	70
11141-16-5	Aroclor-1232	70	U	47	70	70
53469-21-9	Aroclor-1242	51	U	26	51	70
12672-29-6	Aroclor-1248	51	U	26	51	70
11097-69-1	Aroclor-1254	44	U	22	44	70

JBC 4/4/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

PCB ORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-EB01-021011

Lab Name: PEL, Spectrum Analytical, Inc Contract: Vieques / SWMU6 / 404422.FI.

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203710 Lab File ID: 2037-010.D

Sample wt/vol: 975 Units: ML Date Received: 02/11/11

Concentrated Extract Volume: 2 Date Extracted: 02/14/11

Level:(low/med) LOW Date Analyzed: 02/15/11 Time: 1452

PercentSolids: 0 decanted : Dilution Factor: 1

Extraction: SEPF Station ID: Method: 8082

GPC Cleanup : (Y/N) N pH:

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

CONCENTRATION UNITS: UG/L

CAS NO.	*ANALYTE*	*RESULT*	*Q*	*MDL*	*LOD*	*LOQ*
12674-11-2	Aroclor-1016	0.02	U	0.015	0.02	0.02
11096-82-5	Aroclor-1260	0.02	U	0.01	0.02	0.02
11104-28-2	Aroclor-1221	0.02	U	0.018	0.02	0.02
11141-16-5	Aroclor-1232	0.016	U	0.0082	0.016	0.02
53469-21-9	Aroclor-1242	0.02	U	0.013	0.02	0.02
12672-29-6	Aroclor-1248	0.011	U	0.0053	0.011	0.02
11097-69-1	Aroclor-1254	0.0098	U	0.0049	0.0098	0.02

JC 4/14/11

Results reported on Primary Column, if RPD >40% results flagged accordingly.

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD023-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203701

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 28 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	16900000		J [illegible]	P	3860	7710	20300
7440-36-0	Antimony	974	B	UJ	P	487	974	2030
7440-39-3	Barium	12000		J	P	325	649	1010
7440-41-7	Beryllium	395	B	J	P	325	649	1010
7440-43-9	Cadmium	203	B	UJ	P	101	203	1010
7440-70-2	Calcium	25400000		J	P	6700	13400	20300
7440-48-4	Cobalt	5260			P	101	203	1010
7440-50-8	Copper	39600			P	325	649	1010
7439-89-6	Iron	23500000			P	1220	2440	10100
7439-92-1	Lead	6940			P	690	1380	1620
7439-95-4	Magnesium	9390000			P	5880	11800	20300
7439-96-5	Manganese	250000			P	325	649	1010
7439-97-6	Mercury	75.4			CV	7.24	14.5	39.2
7440-02-0	Nickel	7440			P	325	649	1010
7440-09-7	Potassium	3910000			P	10100	20300	101000
7440-22-4	Silver	649	B	UJ	P	325	649	1010
7440-23-5	Sodium	32200000		J	P	20300	40600	60900
7440-28-0	Thallium	1240	B		P	690	1380	2030
7440-62-2	Vanadium	33600			P	325	649	1010
7440-66-6	Zinc	51400			P	670	1340	2030

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1806

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD023P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203702

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 28.8 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	16600000		J %Sol	P	3300	6610	17400
7440-36-0	Antimony	835	+	WJ	P	418	835	1740
7440-39-3	Barium	11300		J	P	278	557	870
7440-41-7	Beryllium	339	+	J	P	278	557	870
7440-43-9	Cadmium	174	+	WJ	P	87	174	870
7440-70-2	Calcium	25400000		J	P	5740	11500	17400
7440-48-4	Cobalt	5180			P	87	174	870
7440-50-8	Copper	37400			P	278	557	870
7439-89-6	Iron	22800000			P	1040	2090	8700
7439-92-1	Lead	6350			P	591	1180	1390
7439-95-4	Magnesium	8700000			P	5040	10100	17400
7439-96-5	Manganese	248000			P	278	557	870
7439-97-6	Mercury	67.6			CV	6.51	13	35.2
7440-02-0	Nickel	7150			P	278	557	870
7440-09-7	Potassium	3490000			P	8700	17400	87000
7440-22-4	Silver	557	+	WJ	P	278	557	870
7440-23-5	Sodium	28800000		J	P	17400	34800	52200
7440-28-0	Thallium	707	+	J	P	591	1180	1740
7440-62-2	Vanadium	35200		J	P	278	557	870
7440-66-6	Zinc	49600		J	P	574	1150	1740

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

150311 1806

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD022-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203703

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 22.2 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	14000000		J%SD	P	4310	8630	22700
7440-36-0	Antimony	1090	B	UJ	P	545	1090	2270
7440-39-3	Barium	9560		J	P	363	726	1140
7440-41-7	Beryllium	380	B	J	P	363	726	1140
7440-43-9	Cadmium	227	B	UJ	P	114	227	1140
7440-70-2	Calcium	14200000		J	P	7490	15000	22700
7440-48-4	Cobalt	5080			P	114	227	1140
7440-50-8	Copper	32500			P	363	726	1140
7439-89-6	Iron	20000000			P	1360	2720	11400
7439-92-1	Lead	6060			P	772	1540	1820
7439-95-4	Magnesium	10300000			P	6580	13200	22700
7439-96-5	Manganese	191000			P	363	726	1140
7439-97-6	Mercury	61.1			CV	8.42	16.8	45.5
7440-02-0	Nickel	6790			P	363	726	1140
7440-09-7	Potassium	3750000			P	11400	22700	114000
7440-22-4	Silver	726	B	UJ	P	363	726	1140
7440-23-5	Sodium	40600000		J	P	22700	45400	68100
7440-28-0	Thallium	1540	B	UJ	P	772	1540	2270
7440-62-2	Vanadium	43700		J	P	363	726	1140
7440-66-6	Zinc	43400		J	P	749	1500	2270

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1805

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD021-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203704

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 24 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	16200000		J %Sol	P	4030	8050	21200
7440-36-0	Antimony	1020	+	UJ	P	509	1020	2120
7440-39-3	Barium	11600		J	P	339	678	1060
7440-41-7	Beryllium	678	+	UJ	P	339	678	1060
7440-43-9	Cadmium	212	+	UJ	P	106	212	1060
7440-70-2	Calcium	53000000		J	P	6990	14000	21200
7440-48-4	Cobalt	5030			P	106	212	1060
7440-50-8	Copper	32100			P	339	678	1060
7439-89-6	Iron	19600000			P	1270	2540	10600
7439-92-1	Lead	6180			P	720	1440	1700
7439-95-4	Magnesium	9550000			P	6150	12300	21200
7439-96-5	Manganese	174000			P	339	678	1060
7439-97-6	Mercury	43	+		CV	8.66	17.3	46.8
7440-02-0	Nickel	7100			P	339	678	1060
7440-09-7	Potassium	3860000			P	10600	21200	106000
7440-22-4	Silver	678	+	UJ	P	339	678	1060
7440-23-5	Sodium	37700000		J	P	21200	42400	63600
7440-28-0	Thallium	1440	+	UJ	P	720	1440	2120
7440-62-2	Vanadium	44500		J	P	339	678	1060
7440-66-6	Zinc	43100		J	P	699	1400	2120

JC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

180311 1806

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD020-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203705

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 24.4 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	29200000		J %Sol	P	4060	8130	21400
7440-36-0	Antimony	1030	U	UJ	P	513	1030	2140
7440-39-3	Barium	19800		J	P	342	684	1070
7440-41-7	Beryllium	612	U	J	P	342	684	1070
7440-43-9	Cadmium	214	U	UJ	P	107	214	1070
7440-70-2	Calcium	4750000		J	P	7060	14100	21400
7440-48-4	Cobalt	7010			P	107	214	1070
7440-50-8	Copper	47600			P	342	684	1070
7439-89-6	Iron	29400000			P	1280	2570	10700
7439-92-1	Lead	12200			P	727	1450	1710
7439-95-4	Magnesium	8880000			P	6200	12400	21400
7439-96-5	Manganese	334000			P	342	684	1070
7439-97-6	Mercury	70.7			CV	7.58	15.2	41
7440-02-0	Nickel	8600			P	342	684	1070
7440-09-7	Potassium	5290000			P	10700	21400	107000
7440-22-4	Silver	684	U	UJ	P	342	684	1070
7440-23-5	Sodium	30800000		J	P	21400	42800	64200
7440-28-0	Thallium	1450	U	UJ	P	727	1450	2140
7440-62-2	Vanadium	56300		J	P	342	684	1070
7440-66-6	Zinc	67800		J	P	706	1410	2140

JAC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

160311 1606

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD019-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203706

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 25.4 Station ID:

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	24500000		J %Sd	P	4630	9260	24400
7440-36-0	Antimony	1170	B	UJ	P	585	1170	2440
7440-39-3	Barium	14000		J	P	390	780	1220
7440-41-7	Beryllium	478	B	J	P	390	780	1220
7440-43-9	Cadmium	244	B	UJ	P	122	244	1220
7440-70-2	Calcium	8510000		J	P	8040	16100	24400
7440-48-4	Cobalt	7330			P	122	244	1220
7440-50-8	Copper	42400			P	390	780	1220
7439-89-6	Iron	34000000			P	1460	2920	12200
7439-92-1	Lead	11300			P	828	1660	1950
7439-95-4	Magnesium	9420000			P	7060	14100	24400
7439-96-5	Manganese	341000			P	390	780	1220
7439-97-6	Mercury	85.8			CV	8.3	16.6	44.8
7440-02-0	Nickel	7880			P	390	780	1220
7440-09-7	Potassium	4860000			P	12200	24400	122000
7440-22-4	Silver	780	B	UJ	P	390	780	1220
7440-23-5	Sodium	37000000		J	P	24400	48700	73100
7440-28-0	Thallium	1700	B	J	P	828	1660	2440
7440-62-2	Vanadium	46800		J	P	390	780	1220
7440-66-6	Zinc	70900		J	P	804	1610	2440

JC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1806

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD018-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FLS

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203707

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 25.4 Station ID:

CONCENTRATION UNITS: UGIKG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	27000000		J +N-SD	P	4000	8010	21100
7440-36-0	Antimony	1010	+	UJ +N-	P	506	1010	2110
7440-39-3	Barium	14800		J	P	337	674	1050
7440-41-7	Beryllium	648	+	J	P	337	674	1050
7440-43-9	Cadmium	211	+	UJ	P	105	211	1050
7440-70-2	Calcium	6260000		J	P	6960	13900	21100
7440-48-4	Cobalt	8480			P	105	211	1050
7440-50-8	Copper	44600			P	337	674	1050
7439-89-6	Iron	35300000		+	P	1260	2530	10500
7439-92-1	Lead	12600			P	716	1430	1690
7439-95-4	Magnesium	9660000			P	6110	12200	21100
7439-96-5	Manganese	359000		+	P	337	674	1050
7439-97-6	Mercury	98.5			CV	8.92	17.8	48.2
7440-02-0	Nickel	8430			P	337	674	1050
7440-09-7	Potassium	5360000			P	10500	21100	105000
7440-22-4	Silver	674	+	UJ	P	337	674	1050
7440-23-5	Sodium	36300000		J +	P	21100	42200	63200
7440-28-0	Thallium	1430	+	UJ	P	716	1430	2110
7440-62-2	Vanadium	54700		J	P	337	674	1050
7440-66-6	Zinc	76000		J	P	696	1390	2110

JMC 4/14/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1606

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-021011

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203710

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7429-90-5	Aluminum	51.8	J		P	9.3	18.6	100
7440-39-3	Barium	0.459	J		P	0.22	0.44	10
7440-41-7	Beryllium	0.24	U		P	0.12	0.24	3.65
7440-70-2	Calcium	61.2	J		P	39	78	100
7439-89-6	Iron	54.8			P	5.5	11	40
7439-95-4	Magnesium	37.6	J		P	9.8	19.6	100
7439-96-5	Manganese	0.7	U		P	0.35	0.7	10
7439-97-6	Mercury	0.074	U		CV	0.037	0.074	0.2
7440-02-0	Nickel	1.86	U		P	0.93	1.86	4.1
7440-09-7	Potassium	143	U		P	71.7	143	500
7782-49-2	Selenium	8.2	U		P	4.1	8.2	9
7440-23-5	Sodium	347			P	180	300	300
7440-28-0	Thallium	5.05	J		P	4.4	8.8	10
7440-62-2	Vanadium	0.578	J		P	0.44	0.88	9
7440-66-6	Zinc	4.05	J		P	4	8	20

JC 4/4/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

180311 1806

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SD018-0211

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): SOIL Lab Sample ID: K0225-07

Level (low/med): MED Date Received: 02/11/2011

% Solids: 24.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	5.9		J %Sol	MS	1.2	1.6	1.6
7440-47-3	Chromium	14.9		~~E~~ J ↓	MS	0.45	1.6	3.2
7782-49-2	Selenium	1.6	B	UJ MBL	MS	0.48	1.6	8.0

JAC 4/4/11

Comments:

ISM_002 FORM I - IN SW846

042

0013 540

3502037

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SD019-0211

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): SOIL Lab Sample ID: K0225-06

Level (low/med): MED Date Received: 02/11/2011

% Solids: 25.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	5.5		J %SOL	MS	0.80	1.1	1.1
7440-47-3	Chromium	13.7		~~B~~ J	MS	0.30	1.1	2.2
7782-49-2	Selenium	1.4		~~B~~ J	MS	0.32	1.1	5.4

4/14/11

Comments:

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-SD023P-0211

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): SOIL Lab Sample ID: K0225-02

Level (low/med): MED Date Received: 02/11/2011

% Solids: 29.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-38-2	Arsenic	2.8		J %Sol	MS	1.0	1.3	1.3
7440-47-3	Chromium	15.1		BJ	MS	0.38	1.3	2.7
7782-49-2	Selenium	1.5	B	J	MS	0.40	1.3	6.7

JAC 4/4/11

Comments:

ISM_002 FORM I - IN SW846

048

3502037

546

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

VWW06-EB01-021011

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): WATER Lab Sample ID: K0225-08

Level (low/med): MED Date Received: 02/11/2011

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-36-0	Antimony	0.52	~~B~~	J	MS	0.20	0.20	2.0
7440-38-2	Arsenic	0.5	U		MS	0.19	0.50	2.0
7440-43-9	Cadmium	0.2	U		MS	0.084	0.20	1.0
7440-47-3	Chromium	1	U		MS	0.16	1.0	2.0
7440-48-4	Cobalt	0.2	U		MS	0.024	0.20	1.0
7440-50-8	Copper	0.5	U		MS	0.23	0.50	5.0
7439-92-1	Lead	0.089	~~B~~	J	MS	0.068	0.20	1.0
7440-22-4	Silver	0.05	U		MS	0.022	0.050	1.0

JC 4/14/11

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD023-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203701

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 28 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	30400			SP	852	1700	3410

J, 1.5UL

04/12/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 934

050

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD023P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203702

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 28.8 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	3630			SP	811	1620	3240

J, Y. SOL

MM 04/12/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 934

051

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD022-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203703

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 22.2 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	9340			SP	1100	2200	4410

J, 1.50L

WA 041211

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 934

052

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD021-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203704

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 24 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	24600			SP	1000	2000	4000

J, J, SDL

WW 041211

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 934

053

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD020-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203705

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 24.4 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	34100			SP	1000	2000	4000

J, Y, SOL

WW 04/12/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 934

054

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD019-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203706

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 25.4 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	36800			SP	989	1980	3950

J, 1.50L

2/11/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 934

055

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD018-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502037

Matrix: SOIL Lab Sample ID: 350203707

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 25.4 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	33900			SP	980	1960	3920

J, %, SOL

WW 04/2/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 934

056

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-EB01-021011

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502037

Matrix: WATER Lab Sample ID: 350203710

Level:(low/med) LOW Date Received: 2/11/2011

PercentSolids: 0 Station ID: _____

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
18540-29-9	Hexavalent Chromium	0.004	J		SP	0.0035	0.007	0.01

J, HT

WW 04/12/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

040411 934

057

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: The following samples were analyzed out of hold: VWW06-EB01-021011. The sample was received out of hold. The sample was analyzed as soon as possible to get as close to the holding time as possible.

III. METHODS

Analyses were performed according to PEL Laboratory's Standard Operating Procedures and EPA Method 7196A.

IV. PREPARATION

There is no preparation step for this test.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

CASE NARRATIVE
HEXAVALENT CHROMIUM

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/17/2011

CompuChem
a division of Liberty Analytical Corp.

CHAIN OF CUSTODY

3502037 78

№ 02393

Page 1 of 1

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier
Airbill No.
Sampling Complete? Y or N

Client/Reporting Information	Project Information
Company Name: CH2M Hill	Project Name: SCMU 6
Address: 5700 Cleveland St, Suite101	Sampling Location
City: Virginia Beach State: VA Zip: 23462	Turnaround time: 1
Project Contact: Victoria Weber	Batch QC or Project Specific? If Specific, which Sample ID?
Phone #: 757 671-6208	Are aqueous samples field filtered for metals? Y or N
Sampler's Name: J. Crostic	Are high concentrations expected? Y or N? If yes, which ID(s)?

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	Number of Preserved Bottles: HCl	NaOH	HNO3	H2SO4	MEOH	Other	Metals	WCHEM	PEST/PCBs	pH / Sample Info (Lab Use)
-01	UWW06-SD023-0211	2/8/11	1300	SO	4							✓	✓	✓	
-02	UWW06-SD023P-0211		1320		3							✓	✓	✓	
-03	UWW06-SD022-0211		1320		4							✓	✓	✓	
-04	UWW06-SD021-0211		1330		4							✓	✓	✓	
-05	UWW06-SD020-0211		1400		4							✓	✓	✓	
-06	UWW06-SD019-0211		1415		4							✓	✓	✓	
-07-08-09	UWW06-SD018-0211	↓	1430	↓	10							✓	✓	✓	

3502037

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

temp 1.1C, 1.8C
pH 2 8260, 6010, 6020A

Sample Custody

Relinquished by:	Date/Time: 2/9/11 1200	Received by:	Date/Time: 2-11-11 0950
Relinquished by:	Date/Time:	Received by:	Date/Time:
Subcontact? Y or N If yes, where?	Custody Seal(s) intact? Y or N	On Ice? Y or N	Cooler Temp:

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for cus*

060753

PEL

A DIVISION OF SPECTRUM ANALYTICAL, INC. formerly HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3502037

Page 1 of 1

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni
5720 Cleveland St
Suite 101
Virginia Beach, VA 23462
Michael.Zamboni@chzm.com
Project Mgr.: Bill Hannah / VBO

Invoice To: _____
P.O. No.: _____ RQN: _____

Project No.: 404422.F1.SW.54
Site Name: SWMU 6
Location: Vieques State: PR
Sampler(s): D. Ballou

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9=_____ 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	VOC	Analyses: PAH	Pest/PCB	Metals	Hex Cr	
-10	VWW06-EB01-021011	2/10/11		~~SW~~	SW	3	5		3	✓	✓	✓	✓	✓	EQUIPMENT BLANK (PONAR DREDGE) FOR SAMPLES COLLECTED 2/8/11 - VWW06-SD01-0211 - VWW06-SD02-0211 - VWW06-SD023-0211 - VWW06-SD022-0211 - VWW06-SD021-0211 - VWW06-SD020-0211 - VWW06-SD019-0211 - VWW06-SD018-0211
-11	VWW06-TB01-021011	2/10/11				3				✓					

☐ E-mail to _____
EDD Format _____

Relinquished by: _____ Received by: _____ Date: 2/11/11 Time: 950

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

3502037 061 754

FedEx Express International Air Waybill

FedEx Tracking Number 8747 2112 6611 Form ID No. 0402

From

Date 02/07/11 Sender's FedEx Account Number

Sender's Name Jake Crosby Phone 757 671 6186

Company CH2M Hill

Address Camp Garcia

Address BLDG 4525

City Vieques State/Province PR

Country USA ZIP/Postal Code 00765

To

Recipient's Name John Heyman Phone 813-888-9507

Company H.E.L Labs - Sample Recieving

Address 8405 Benjamin Rd Dept/Floor

Address Suite A

City Tampa State/Province FL

Country USA ZIP/Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g., GST/PFC/VAT/AN/EIN/ABN, or as locally required.

4 Express Package Service

Packages up to 150 lbs./68 kg
For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.

1 [X] FedEx Intl. Priority 6 [ ] FedEx Intl. First* Available to select locations.

[ ] 3 [ ] FedEx Intl. Economy FedEx Envelope and FedEx Pak rate not available.

Not all services and options are availabl to all destinations. Dangerous goods c be shipped using th Air Waybill.

5 Packaging

*These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 [ ] FedEx Envelope 2 [ ] FedEx Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube

1 [X] Other cooler PW [ ] FedEx 10kg Box* PX [ ] FedEx 25kg Box*

6 Special Handling

1 [ ] HOLD at FedEx Location 3 [ ] SATURDAY Delivery Available to select locations for FedEx Intl. Priority only.

7 Payment

Complete payment options for both transportation charges and duties and taxes.

Bill transportation charges to:

Enter FedEx Acct. No. or Credit Card No. below.

1 [ ] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [X] Third Party 4 [ ] Credit Card 5 [ ] Cash/Check/Cheque Total Transportation

FedEx Acct. No. 1867 18208

Credit Card Exp. Date

Bill duties and taxes to:

Specify Currency

ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

Enter FedEx Acct. No. below.

1 [ ] Sender Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [X] Third Party 5 [ ] Cash Check/Cheque

FedEx Acct. No. 1867 18208

8 Your Internal Billing Reference

First 24 characters will appear on invoice.

404422.F1 5

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Carriage as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

568

PART 158418 Rev. Date 11/04 ©1994-2008 FedEx PRINTED IN U.S.A.

Shipment Information

[ ] For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 [X] lbs. [ ] kg DIM / / in. [ ] cm [ ]

Commodity Description	Harmonized Code	Country of Manufacture	Value for Customs
Samples			0

Is EEI been filed in AES? For U.S. Export Only: Check One

[ ] No EEI required, enter exemption number

[ ] Yes – Enter AES proof of filing citation:

[ ] No EEI required, Value $2,500 or less per Sch. B Number, or license required (NLR), not subject to ITAR.

If other than NLR, enter License Exception:

Total Declared Value for Carriage

Total Value for Customs (Specify Currency) 0

FedEx Tracking Number 8747 2112 6611 0402 Form ID No.

Origin Station ID	Country Code/Destination Station ID	URSA Routing	Handling Units
			Total Volume (cm)

Received At: 1 [ ] Reg. Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] World Service Center 5 [ ] Station

Forms Attached: [ ] CI [ ]

Base Charges ____ Declared Val. Chrg. ____ Other ____ DBA/DPA ____ Credit Card Auth. ____

FedEx Emp. # ____ Audit Emp. # ____ Date ____ Time ____ Del. Courier Emp. # ____ Date ____ Time ____

FedEx Express International Air Waybill

FedEx Tracking Number 8747 2112 6552 Form ID No. 0402

From

Date 2/10/11 Sender's FedEx Account Number

Sender's Name JAKE Crosta Phone

Company CH2M Hill

Address Camp Garrick

Address BLDG 4525

City Vieques State/Province PR

Country USA ZIP/Postal Code 00765

To

Recipient's Name John Heyman Phone 813 393 1507

Company FEL Lab - Sample Receiving

Address 3405 Benjamin Rd Dept/Floor

Address Suite A

City Tampa State/Province FL

Country USA ZIP/Postal Code 33634

Recipient's Tax ID Number for Customs Purposes
e.g., GST/RFC/VAT/IN/EIN/ABN, or as locally required.

Shipment Information ☐ For EU Only: Tick here if goods are not in free circulation and provide C.I.

Total Packages (Shipper's Load and Count/SLAC) 1 Total Weight 50 ☒ lbs ☐ kg DIM L 1 W 1 H ☐ in. ☐ cm

Commodity Description	Harmonized Code	Country of Manufacture	Value for Customs
Samples		USA	50

EEI been filed in AES? X Export Only: Check One ☐ No EEI required, value $2,500 or less per Sch. B Number, no license required (NLR), not subject to ITAR.

No EEI required, enter exemption number: If other than NLR, enter License Exception:

Yes – Enter AES proof of filing citation:

Total Declared Value for Carriage: 50

Total Value for Customs (Specify Currency): USD

4 Express Package Service — *Packages up to 150 lbs./68 kg. For packages over 150 lbs. (68 kg), use the FedEx Expanded Service Intl. Air Waybill.*

1 ☒ FedEx Intl. Priority 6 ☐ FedEx Intl. First* *Available to select locations.

☐ 3 ☐ FedEx Intl. Economy FedEx Envelope and FedEx Pak rate not available.

Not all services and options are available to all destinations. Dangerous goods can be shipped using this Air Waybill.

5 Packaging *These unique brown boxes with special pricing are provided by FedEx for FedEx Intl. Priority only.

6 ☒ FedEx Envelope 2 ☐ FedEx Pak 3 ☐ FedEx Box 4 ☐ FedEx Tube

1 ☐ Other cooler PW ☐ FedEx 10kg Box* PX ☐ FedEx 25kg Box*

6 Special Handling

1 ☐ HOLD at FedEx Location 3 ☐ SATURDAY Delivery *Available to select locations for FedEx Intl. Priority only.*

7 Payment — Complete payment options for both transportation charges and duties and taxes.

Bill transportation charges to: Enter FedEx Acct. No. or Credit Card No. below.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check/Cheque Total Transportation

FedEx Acct. No. 1[illegible]3718208

Credit Card Exp. Date Specify Currency

Bill duties and taxes to: Enter FedEx Acct. No. below. ALL shipments may be subject to Customs charges, which FedEx does not estimate prior to clearance.

1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☒ Third Party 5 ☐ Cash/Check/Cheque

FedEx Acct. No. 1[illegible]3718208

8 Your Internal Billing Reference First 24 characters will appear on invoice.

451422 F.I. SW

9 Required Signature

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not require a U.S. State Department License or contain dangerous goods. Certain international treaties, including the Warsaw Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract. WARNING: These commodities, technology, or software were exported from the United States in accordance with Export Administration Regulations. Diversion contrary to U.S. law prohibited.

Sender's Signature:

This is not authorization to deliver this shipment without a recipient signature.

Received above shipment in good order and condition. We agree to pay all charges, including Customs duties and taxes as applicable, and we agree to the Conditions of Carriage as stated on the reverse side of the Recipient's Copy.

Recipient's Signature:

568

PART 158410 Rev. Date 11/08 ©1994–2008 FedEx PRINTED IN U.S.A. RR

FedEx Tracking Number 8747 2112 6552 Form ID No. 0402

Origin Station ID	Country Code/Destination Station ID	URSA Routing	Handling Units
CNJA	VI PT	VJ TPT	Total Volume (cm)

Received At: 1 ☐ Reg. Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ World Service Center 5 ☐ Station Forms Attached: ☐ CI ☐

Base Charges FedEx Emp. # Declared Val. Chg. Audit Emp. # Other ODA/OPA Date Time Credit Card Auth. Del. Courier Emp. # Date Time

3502037

063 756

PEL, a Division of Spectrum Analytical, Inc.

pH LOG SHEET

Work Order # 3502037 By NH

Client / Project Name Cham Hill / Sieques / Swmu 6 / 404422.F1.Sw.S6 Date 2-11-11

PEL Sample Number	H_2SO_4 (pH<2)		HNO_3 (pH<2) 6010, 6010D		NaOH (pH>12)		ZnAC/NaOH (pH>9)		HCl (pH<2) 8260		Other ____ pH ____	
	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH	No. of Containers	pH
01												
02												
03												
04												
05												
06												
07												
08												
09												
10			2	<2					3	<2		
11									3	<2		
12												
13												
14												
15												
16												
17												
18												
19												
20												

3502037

W:\Login\Forms\pH LOG SHEET REV 4.doc

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	3502037	**Req:**	90619
Client:	CH2M Hill	**Project:**	CTO-083 / CTO-111 SWMU 6
Level:	1	**Date Rec'd:**	2/11/2011 9:50:00 AM
Rec'd via:	Fed-Ex	**Due Date:**	2/25/2011

Sample Verification

Samples/Cooler Secure?	Yes	**All Samples on COC accounted For?**	Yes
Temperature of Samples(Celsius)	1.1C/1.8C	**All Samples Rec'd Intact?**	Yes
pH Verified?	Yes	**Sample Vol. Sufficient For Analysis**	Yes
pH WNL?	Yes	**Samples Rec'd W/I Hold Time?**	Yes
Soil Origin (Domestic/Foreign):	Domestic	**Are All Samples to be Analyzed?**	Yes
Site Location/Project on COC?	Yes	**Correct Sample Containers?**	Yes
Client Project # on COC?	Yes	**COC Comments written on COC?**	Yes
Project Mgr. Indicated on COC?	Yes	**Samplers Initials on COC?**	Yes
COC relinquished/Dated by Client?	Yes	**Sample Date/Time Indicated?**	Yes
COC Received/Dated by PEL?	Yes	**TAT Requested:**	STD
Specific Subcontract Indicated?	No	**Client Requests Verbal Results?**	No
Samples Received By	Fed-Ex	**Client Requests Faxed Results?**	No
PEL to Conduct ALL Analyses?	No	**Specific tests noted on COC**	
Radioactivity Check?	No		
COC Present?	Yes		

PEER REVIEW _____

Client: CH2M Hill

WONo: 3502037 Profile Name: Vieques Profile #: 90619

MATRIX S

Sample #	Bottle	Parameter		Check	Received	Date
01	004	6010	Metals	In	Nicole Labus	2/11/2011 10:56:28 AM
01	004	6010	Metals	Out	Gerson Galvis	2/14/2011 6:26:35 AM
01	004	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:29 AM
01	004	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:28 AM
01	004	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:19 AM
01	004	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:57:42 PM
01	004	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:28 AM
01	004	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:15 AM
01	004	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:38 AM
01	001	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:42 AM
01	001	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:12 AM
01	001	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:31 PM
01	001	8082	PCB	In	Nicole Labus	2/11/2011 10:58:42 AM
01	001	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:13 AM
01	001	8082	PCB	In	Frank Colosi	2/11/2011 7:14:32 PM
01	004	9045	Corosivity - pH	In	Nicole Labus	2/11/2011 10:56:28 AM
01	004	9045	Corosivity - pH	Out	Gerson Galvis	2/18/2011 9:45:10 AM
01	004	9045	Corosivity - pH	In	Gerson Galvis	2/18/2011 10:46:48 AM
01	004	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:28 AM
01	004	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:07 AM
01	004	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:39 AM
02	003	6010	Metals	In	Nicole Labus	2/11/2011 10:56:25 AM
02	002	6010	Metals	Out	Gerson Galvis	2/14/2011 6:26:38 AM
02	002	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:30 AM
02	003	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:25 AM
02	002	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:22 AM
02	002	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:57:44 PM
02	003	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:25 AM

02	002	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:18 AM
02	002	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:41 AM
02	002	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:45 AM
02	002	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:15 AM
02	002	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:34 PM
02	002	8082	PCB	In	Nicole Labus	2/11/2011 10:58:45 AM
02	002	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:15 AM
02	002	8082	PCB	In	Frank Colosi	2/11/2011 7:14:34 PM
02	003	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:25 AM
02	002	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:09 AM
02	002	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:41 AM
03	002	6010	Metals	In	Nicole Labus	2/11/2011 10:56:22 AM
03	003	6010	Metals	Out	Gerson Galvis	2/14/2011 6:26:41 AM
03	003	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:32 AM
03	002	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:22 AM
03	003	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:25 AM
03	003	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:57:48 PM
03	002	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:22 AM
03	003	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:22 AM
03	003	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:43 AM
03	003	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:36 AM
03	003	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:17 AM
03	003	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:36 PM
03	003	8082	PCB	In	Nicole Labus	2/11/2011 10:58:36 AM
03	003	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:17 AM
03	003	8082	PCB	In	Frank Colosi	2/11/2011 7:14:36 PM
03	003	9045	Corosivity - pH	In	Nicole Labus	2/11/2011 10:56:22 AM
03	003	9045	Corosivity - pH	Out	Gerson Galvis	2/18/2011 9:45:12 AM
03	003	9045	Corosivity - pH	In	Gerson Galvis	2/18/2011 10:46:50 AM
03	002	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:22 AM
03	003	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:11 AM
03	003	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:43 AM

04	003	6010	Metals	In	Nicole Labus	2/11/2011 10:56:20 AM
04	003	6010	Metals	Out	Gerson Galvis	2/14/2011 6:26:45 AM
04	003	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:33 AM
04	003	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:20 AM
04	003	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:29 AM
04	003	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:57:52 PM
04	003	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:20 AM
04	003	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:28 AM
04	003	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:46 AM
04	001	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:35 AM
04	001	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:19 AM
04	001	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:37 PM
04	001	8082	PCB	In	Nicole Labus	2/11/2011 10:58:35 AM
04	001	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:19 AM
04	001	8082	PCB	In	Frank Colosi	2/11/2011 7:14:37 PM
04	003	9045	Corosivity - pH	In	Nicole Labus	2/11/2011 10:56:20 AM
04	003	9045	Corosivity - pH	Out	Gerson Galvis	2/18/2011 9:45:14 AM
04	003	9045	Corosivity - pH	In	Gerson Galvis	2/18/2011 10:46:51 AM
04	003	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:20 AM
04	003	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:12 AM
04	003	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:46 AM
05	003	6010	Metals	In	Nicole Labus	2/11/2011 10:56:29 AM
05	003	6010	Metals	Out	Gerson Galvis	2/14/2011 6:26:49 AM
05	003	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:35 AM
05	003	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:29 AM
05	003	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:32 AM
05	003	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:57:54 PM
05	003	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:29 AM
05	003	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:32 AM
05	003	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:48 AM
05	002	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:47 AM
05	002	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:21 AM

05	002	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:38 PM
05	002	8082	PCB	In	Nicole Labus	2/11/2011 10:58:47 AM
05	002	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:21 AM
05	002	8082	PCB	In	Frank Colosi	2/11/2011 7:14:38 PM
05	003	9045	Corosivity - pH	In	Nicole Labus	2/11/2011 10:56:29 AM
05	003	9045	Corosivity - pH	Out	Gerson Galvis	2/18/2011 9:45:15 AM
05	003	9045	Corosivity - pH	In	Gerson Galvis	2/18/2011 10:46:52 AM
05	003	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:29 AM
05	003	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:14 AM
05	003	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:48 AM
06	001	6010	Metals	In	Nicole Labus	2/11/2011 10:56:15 AM
06	001	6010	Metals	Out	Gerson Galvis	2/14/2011 6:26:52 AM
06	001	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:36 AM
06	001	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:15 AM
06	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:34 AM
06	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:57:56 PM
06	001	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:15 AM
06	001	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:36 AM
06	001	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:50 AM
06	003	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:39 AM
06	003	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:23 AM
06	003	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:40 PM
06	003	8082	PCB	In	Nicole Labus	2/11/2011 10:58:39 AM
06	003	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:23 AM
06	003	8082	PCB	In	Frank Colosi	2/11/2011 7:14:40 PM
06	001	9045	Corosivity - pH	In	Nicole Labus	2/11/2011 10:56:15 AM
06	001	9045	Corosivity - pH	Out	Gerson Galvis	2/18/2011 9:45:17 AM
06	001	9045	Corosivity - pH	In	Gerson Galvis	2/18/2011 10:46:53 AM
06	001	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:15 AM
06	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:16 AM
06	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:50 AM
07	001	6010	Metals	In	Nicole Labus	2/11/2011 10:56:17 AM

07	001	6010	Metals	Out	Gerson Galvis	2/14/2011 6:26:56 AM
07	001	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:38 AM
07	001	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:17 AM
07	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:36 AM
07	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:57:59 PM
07	001	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:17 AM
07	001	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:42 AM
07	001	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:51 AM
07	004	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:48 AM
07	004	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:25 AM
07	004	8081	Pesticides	In	Frank Colosi	2/11/2011 7:14:41 PM
07	004	8082	PCB	In	Nicole Labus	2/11/2011 10:58:48 AM
07	004	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:25 AM
07	004	8082	PCB	In	Frank Colosi	2/11/2011 7:14:41 PM
07	001	9045	Corosivity - pH	In	Nicole Labus	2/11/2011 10:56:17 AM
07	001	9045	Corosivity - pH	Out	Gerson Galvis	2/18/2011 9:45:19 AM
07	001	9045	Corosivity - pH	In	Gerson Galvis	2/18/2011 10:46:55 AM
07	001	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:17 AM
07	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:18 AM
07	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:51 AM
08	001	6010	Metals	In	Nicole Labus	2/11/2011 10:56:13 AM
08	001	6010	Metals	Out	Gerson Galvis	2/14/2011 6:27:00 AM
08	001	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:40 AM
08	001	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:13 AM
08	001	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:38 AM
08	001	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:58:01 PM
08	001	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:13 AM
08	001	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:47 AM
08	001	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:53 AM
08	002	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:40 AM
08	002	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:27 AM
08	002	8081	Pesticides	In	Frank Colosi	2/11/2011 7:15:28 PM

08	002	8082	PCB	In	Nicole Labus	2/11/2011 10:58:40 AM
08	002	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:27 AM
08	002	8082	PCB	In	Frank Colosi	2/11/2011 7:15:28 PM
08	001	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:13 AM
08	001	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:20 AM
08	001	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:53 AM
09	003	6010	Metals	In	Nicole Labus	2/11/2011 10:56:02 AM
09	003	6010	Metals	Out	Gerson Galvis	2/14/2011 6:27:05 AM
09	003	6010	Metals	In	Gerson Galvis	2/14/2011 10:16:41 AM
09	003	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:56:09 AM
09	003	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/15/2011 7:45:40 AM
09	003	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/15/2011 3:58:03 PM
09	003	7471	Mercury	In	Nicole Labus	2/11/2011 10:56:07 AM
09	003	7471	Mercury	Out	Gerson Galvis	2/15/2011 5:36:50 AM
09	003	7471	Mercury	In	Gerson Galvis	2/15/2011 9:09:55 AM
09	001	8081	Pesticides	In	Nicole Labus	2/11/2011 10:58:31 AM
09	001	8081	Pesticides	Out	Frank Colosi	2/11/2011 11:13:29 AM
09	001	8081	Pesticides	In	Frank Colosi	2/11/2011 7:15:31 PM
09	001	8082	PCB	In	Nicole Labus	2/11/2011 10:58:31 AM
09	001	8082	PCB	Out	Frank Colosi	2/11/2011 11:13:29 AM
09	001	8082	PCB	In	Frank Colosi	2/11/2011 7:15:31 PM
09	003	Dry Weight	Dry Weight	In	Nicole Labus	2/11/2011 10:56:10 AM
09	003	Dry Weight	Dry Weight	Out	Gerson Galvis	2/15/2011 5:38:21 AM
09	003	Dry Weight	Dry Weight	In	Gerson Galvis	2/15/2011 9:09:55 AM

WONo: 3502037 Profile Name: Vieques Profile #: 90619

MATRIX W

Sample #	Bottle	Parameter		Check	Received	Date
10	011	6010	Metals	In	Nicole Labus	2/11/2011 11:01:55 AM
10	011	6010	Metals	Out	Gerson Galvis	2/11/2011 1:03:51 PM
10	011	6010	Metals	In	Gerson Galvis	2/11/2011 2:34:08 PM
10	004	7196A	Hex Chrom	In	Nicole Labus	2/11/2011 10:49:15 AM
10	004	7196A	Hex Chrom	Out	Sylvia Lukasiewicz	2/11/2011 10:49:44 AM
10	004	7196A	Hex Chrom	In	Sylvia Lukasiewicz	2/11/2011 11:24:55 AM
10	011	7470	Mercury	In	Nicole Labus	2/11/2011 11:01:55 AM
10	011	7470	Mercury	Out	Gerson Galvis	2/14/2011 12:34:42 PM
10	011	7470	Mercury	In	Gerson Galvis	2/14/2011 2:05:28 PM
10	003	8081	Pesticides	In	Nicole Labus	2/11/2011 11:00:41 AM
10	003	8081	Pesticides	Consumed	Christelle Abadia	2/11/2011 11:00:58 AM
10	005	8081	Pesticides	Consumed	Christelle Abadia	2/15/2011 7:51:41 AM
10	005	8082L	PCB	In	Nicole Labus	2/11/2011 11:01:38 AM
10	006	8082L	PCB	In	Nicole Labus	2/11/2011 11:01:45 AM
10	006	8082L	PCB	Consumed	Christelle Abadia	2/14/2011 7:39:09 AM
10	007	8260	Volatile Organic Compounds	In	Nicole Labus	2/11/2011 11:04:25 AM
10	010	8260	Volatile Organic Compounds	In	Nicole Labus	2/11/2011 11:04:27 AM
10	002	8260	Volatile Organic Compounds	In	Nicole Labus	2/11/2011 11:04:29 AM
10	007	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:13:56 AM
10	008	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/11/2011 11:00:36 AM
10	008	8270_SIM	GCMS semivolatile SIM	Consumed	Christelle Abadia	2/11/2011 11:00:54 AM
10	001	8270_SIM	GCMS semivolatile SIM	In	Nicole Labus	2/11/2011 11:01:32 AM
11	003	8260	Volatile Organic Compounds	In	Nicole Labus	2/11/2011 11:04:20 AM
11	001	8260	Volatile Organic Compounds	In	Nicole Labus	2/11/2011 11:04:22 AM
11	002	8260	Volatile Organic Compounds	In	Nicole Labus	2/11/2011 11:04:22 AM
11	002	8260	Volatile Organic Compounds	Consumed	Marcell Stephens	2/14/2011 8:14:00 AM

Letter of Acceptance

Customer Name:	CH2M Hill
Date and Time Received:	2/11/2011 9:50:00 AM
Date to be Reported:	3/7/2011
Laboratory Submission Number/SDG:	3502037
Get Detailed Analyte List here:	www.pelab.com/webdms/Default.asp?LoaSDG=3502037
Project:	Vieques / SWMU6 / 404422.FI.SW>S6

Samples: The submission consisted of 11 samples, including QC, with sample identification shown in the attached data tables.

Tests: The Samples will be analyzed for EPA methods: 6010, 6020OL, 7196A, 7471, 8081, 8082, 8260, 9045, ORP.

Sample Custody/COC discrepancies:

None.

Notes:

None.

Distribution of Report to:

CH2M Hill
Attn: Michael Zamboni
(W): 703.376.5301

Note: Submitted material will be retained for 30 days unless otherwise requested by client or consumed in analysis. PEL letters and reports are for the exclusive use of the client to whom they are addressed. Our letters and reports apply to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar materials

1

Log-in Report

Level: 4

Total of: 84 analyses on 14 samples (including QC)

14-Feb-11

Report/SDG #: 3502037

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD023-0211	350203701		S	2/8/2011 1:00:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD023P-0211	350203702		S	2/8/2011 1:30:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
Dry Weight	Dry Weight	Dry Weight

Report/SDG #: 3502037

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD022-0211	350203703		S	2/8/2011 1:20:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD021-0211	350203704		S	2/8/2011 1:30:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

Report/SDG #: 3502037

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD020-0211	350203705		S	2/8/2011 2:00:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD019-0211	350203706		S	2/8/2011 2:15:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

Report/SDG #: 3502037

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD018-0211	350203707		S	2/8/2011 2:30:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
9045	Corosivity - pH	9045
Dry Weight	Dry Weight	Dry Weight
ORP	ORP	ORP

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD018-0211MS	350203708		S	2/8/2011 2:30:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
Dry Weight	Dry Weight	Dry Weight

Report/SDG #: 3502037

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD018-0211SD	350203709		S	2/8/2011 2:30:00 PM	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7471	Mercury	7471
8081	Pesticides	8081
8082	PCB	8082
Dry Weight	Dry Weight	Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-EB01-021011	350203710		W	2/10/2011	2/11/2011 9:50:00 AM

Method		
6010	Metals	6010
6020OL	ICP/MS Metals Outside Lab	6020
7196A	Hex Chrom	7196
7470	Mercury	7470
8081	Pesticides	8081
8082L	PCB	8082
8260	Volatile Organic Compounds	8260
8270_SIM	GCMS semivolatile SIM	8270 SIM

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-TB01-021011	350203711		W	2/10/2011	2/11/2011 9:50:00 AM

Method		
8260	Volatile Organic Compounds	8260

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Friday, February 25, 2011 7:01 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: Vieques 7196A / 3502037

Good afternoon.

Please note the following that will appear in the case narrative for method 7196 on SDG 3502037.

Please note:

A. Spikes:

1. **Laboratory Control Spikes (LCS):**

   An LCS/LCSD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met.

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
   MS - VWW06-SD018-0211MS was analyzed with the soil samples on 02/15/11. The following analyte(s) were recovered below criteria: Hexavalent Chromium at 74.8 % with criteria of (75-125).

   SD - VWW06-SD018-0211SD was analyzed with the soil samples on 02/15/11. The following analyte(s) were recovered below criteria: Hexavalent Chromium at 68 % with criteria of (75-125).

   Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material.

In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Tuesday, March 01, 2011 5:38 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3502037-8081-Vieq

Good afternoon.

Please note the following that will appear in the case narrative for method 8081 on SDG 3502037.

I. HOLDING TIMES

A. Sample Preparation: The following samples were re-prepped out of hold: VWW06-SD019-0211RE1, VWW06-SD021-0211RE1. These samples were originally extracted within holding time. Both sets of data are reported.

B. Sample Analysis: All holding times were met.

II. METHODS

EPA SW846 8081.

III. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8081 semi-volatile analysis.
Water samples were prepared by SW846 EPA 3510 for 8081 semi-volatile analysis.

IV. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met with the exception of:
Sample VWW06-SD019-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 61.5 % with criteria of (70-125). This sample was re-extracted and analyzed out of holding time and had similar results. Both sets of data are reported.

Sample VWW06-SD019-0211RE1 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 63.8 % with criteria of (70-125).

Sample VWW06-SD021-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 58.6 % with criteria of (70-125). This sample was re-extracted and re-analyzed out of holding time. The re-extract passed all criteria. Both sets of data are reported.

Samples coded accordingly.

D. Spikes:

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
SD - VWW06-SD018-0211SD was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered below criteria: 4,4'-DDT at 42 % with criteria of (45-140).

Since this was recovered slightly low and all other criteria were met, no further action was taken. Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: Vickie.Weber@ch2m.com
Sent: Wednesday, March 02, 2011 10:30 AM
To: John Heyman [PEL]
Subject: Corrections Memo
Attachments: CTF_030211_vw.pdf

Hello John,

Sorry for the delay in this correction, as I was going through the field notes from the project, I realized there were some time discrepancies. Please see the attached form for updates to sample times from the COC.

Let me know if you have questions or concerns.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 14, 2011 1:23 PM
To: Zamboni, Michael/WDC; Brynildsen, Victoria/VBO
Subject: 3502004 / Vieques / 7196A

Good morning.

Please note the following that will appear in the case narrative for method 7196 on SDG 3502004.

A. **Sample Analysis:** The following samples were analyzed out of hold: VWW06-EB01-020811, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, VWW06-SW023P-0211. The samples were received out of hold. The samples were analyzed as soon as possible to get as close to the holding time as possible. Samples were analyzed approximately 4 hours out of hold.

B. **Samples:**

Sample analysis proceeded normally.
Sample VWW06-SD015-0211 required a 10X dilution due to high concentration of the following analyte (s): Hexavalent Chromium.

Please contact me with any questions or concerns.

Thanks!

In observance of Presidents' Day, PEL, a Division of Spectrum Analytical, Inc., will be closed Monday, February 21st.

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology

Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

Corrections to COCs

TO: John Heyman
PEL

COPIES: File
EDD
Data Package

FROM: Victoria Weber
Environmental Information Specialist
CH2M HILL

DATE: March 2, 2011

This memo is to document corrections made to entries on the Chains of Custody (COC) for Vieques SWMU 6, CTO-111.

The following Sample times need to be updated.

Correct Sample ID	Date	Correct Time	Incorrect Time
VWW06-SD018-0211	2/8/2011	16:30	14:30
VWW06-SD018-0211MS	2/8/2011	16:30	14:30
VWW06-SD018-0211SD	2/8/2011	16:30	14:30
VWW06-SD019-0211	2/8/2011	16:15	14:15
VWW06-SD020-0211	2/8/2011	16:00	14:00
VWW06-SD021-0211	2/8/2011	15:30	13:30
VWW06-SD022-0211	2/8/2011	15:20	13:20
VWW06-SD023-0211	2/8/2011	15:00	13:00
VWW06-SD023P-0211	2/8/2011	15:00	13:30

COPYRIGHT 2011 BY CH2M HILL, INC. • COMPANY CONFIDENTIAL

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, March 16, 2011 4:49 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: 3502037 / Vieques / 6010

Good afternoon.

Please note the following that will appear in the case narrative for method 6010 on SDG 3502037.

1. **Calibration Blanks:**

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB949733 was analyzed on 02/14/11 15:45. The following analyte(s) were detected below RL: Aluminum at 24 UG/L, Beryllium at 0.23 UG/L, Iron at 17.4 UG/L, Manganese at -0.501 UG/L, Nickel at -1.44 UG/L, Selenium at -5.4 UG/L.
CCB949751 was analyzed on 02/14/11 17:26. The following analyte(s) were detected below RL: Aluminum at 20.9 UG/L, Antimony at 3.06 ug/L, Beryllium at 0.166 UG/L, Iron at 6.61 UG/L, Manganese at -0.761 UG/L, Nickel at -1.85 UG/L.
CCB949763 was analyzed on 02/14/11 18:20. The following analyte(s) were detected below RL: Aluminum at 24.9 UG/L, Antimony at 2.97 ug/L, Beryllium at 0.193 UG/L, Iron at 17.7 UG/L, Manganese at -0.446 UG/L, Nickel at -1.96 UG/L, Thallium at 5.38 UG/L.
CCB949764 was analyzed on 02/14/11 18:24. The following analyte(s) were detected below RL: Aluminum at 20.8 UG/L, Beryllium at 0.125 UG/L, Iron at 5.74 UG/L, Manganese at -0.627 UG/L, Nickel at -2.12 UG/L.
CCB949776 was analyzed on 02/14/11 19:19. The following analyte(s) were detected below RL: Aluminum at 23.9 UG/L, Beryllium at 0.216 UG/L, Iron at 14.8 UG/L, Manganese at -0.677 UG/L, Nickel at -2.02 UG/L.

ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Aluminum at 21.3 UG/L, Barium at 0.347 UG/L, Beryllium at 0.328 UG/L, Cadmium at 0.556 ug/L, Cobalt at 0.521 ug/L, Iron at 31.2 UG/L, Magnesium at 19.2 UG/L, Manganese at -0.401 UG/L, Potassium at 98.8 UG/L, Thallium at 4.68 UG/L.
CCB961320 was analyzed on 03/15/11 12:18. The following analyte(s) were detected below RL: Calcium at 99.6 UG/L, Manganese at -0.699 UG/L.
CCB961446 was analyzed on 03/15/11 13:34. The following analyte(s) were detected below RL: Aluminum at 15.3 UG/L, Iron at 18 UG/L, Manganese at -0.68 UG/L, Nickel at -1.45 UG/L.
CCB961465 was analyzed on 03/15/11 15:46. The following analyte(s) were detected below RL: Manganese at -0.769 UG/L, Nickel at -2.12 UG/L, Vanadium at 0.526 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Method Blanks:**

All acceptance criteria were met with the exception of:
Blank 71228MB was analyzed with the water samples on 02/14/11. The following analyte(s) were detected below RL: Aluminum at 11.2 UG/L, Iron at 8.31 UG/L. The hits in the blank are below the RL, therefore, no corrective action was taken.
Samples coded accordingly.

3. **Post Digestion Spike:**

All acceptance criteria were met with the exception of:
Post Digestion Spike 350203707A was analyzed with the soil samples on 03/15/11. The following analyte(s) were recovered below criteria: Iron at 76 % with criteria of (80-120). Since Iron only slightly exceeds limits for the PDS and since the LCS/LCSD pass all quality control

criteria, no further action was taken.

4. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

MS - VWW06-SD018-0211MS was analyzed with the soil samples on 03/15/11. The following analyte(s) were recovered below criteria: Antimony at 38.2 % with criteria of (80-120), Iron at 65.7 % with criteria of (80-120), Manganese at 72.8 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 128.4 % with criteria of (80-120).

SD - VWW06-SD018-0211SD was analyzed with the soil samples on 03/15/11. The following analyte(s) were recovered below criteria: Antimony at 39.2 % with criteria of (80-120), Iron at 71.6 % with criteria of (80-120), Manganese at 66.7 % with criteria of (80-120), Sodium at 69.6 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 148 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.
Samples coded accordingly.

B. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350202102L was analyzed with the water samples on 02/14/11. The following analyte(s) exceeded criteria: Aluminum at 11 % with criteria of (10). Since Aluminum only slightly exceeds limits for the SD and since the LCS/LCSD pass all quality control criteria, no further action was taken.
Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

John Heyman [PEL]

From: Michael.Zamboni@CH2M.com
Sent: Thursday, March 31, 2011 7:16 PM
To: John Heyman [PEL]
Cc: Clairette.Campbell@ch2m.com; Troy.Horn@ch2m.com; Michael.Zamboni@CH2M.com
Subject: RE: 7196 soil LOD issue Vieques SWMU6 3501993

John, thanks again for sending this. We still need updated Form 1s for the following samples which belong to SDGs 3502004 and 3502037. I realize that the results won't change, but the LODs will, and they're shown on the Form 1s.

VWW06-SD017-0211
VWW06-SD016-0211
VWW06-SD015-0211
VWW06-SD014-0211
VWW06-SD002-0211*
VWW06-SD001-0211*
VWW06-SD023-0211
VWW06-SD023P-0211
VWW06-SD022-0211
VWW06-SD021-0211
VWW06-SD020-0211
VWW06-SD019-0211
VWW06-SD018-0211

* The LOD might not change for these two samples. Can't tell.

Thanks,
Mike Z.

From: Zamboni, Michael/WDC
Sent: Thursday, March 31, 2011 12:32 PM
To: John Heyman [PEL]
Cc: Campbell, Clairette/VBO; Horn, Troy/VBO; Zamboni, Michael/WDC
Subject: RE: 7196 soil LOD issue Vieques SWMU6 3501993

Hi John,

Thanks for sending this. I don't know what else you've been sending other people. I suspect you sent me these replacement pages since the nondetect results for those two samples changed. However, since all the LODs are incorrect for sediment HexCr, we'll need replacement Form 1s for all the sediment HexCr samples (because the LOD is shown next to the DL and LOQ). Then, the corrected LODs can be used to update (here, on our end), the combined EDD which contains all the data for this site/project.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]

Sent: Thursday, March 31, 2011 10:05 AM
To: Zamboni, Michael/WDC
Subject: 7196 soil LOD issue Vieques SWMU6 3501993

Mike:
We have corrected the issues with the adjusted LOD for 7196 soils on 3501993. Attached are Form 1s for the 7196. The non-detect values for 7196 on samples VWW06-SD004-0211 (-04) and VWW06-SD005-0211 (-05) have been adjusted.
Let me know if you would like the report and EDD revised with these values.
Also, I checked all other SDGs for Vieques SWMU6 and there are no other non-detect samples for 7196 soils (3502004 and 3502037).
Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

PEL, a Division of Spectrum Analytical, Inc.
8405 Benjamin Rd., Suite A
Tampa, FL 33634
(P) 813-888-9507 (F) 813-889-7128

CHAIN-OF-CUSTODY RECORD

Friday, February 11, 2011 5:27:41 PM

WorkOrder: 3502037

Send to:
Mitkem
175 Metro Center Blvd.
Warwick, RI 02886
Phone: 401-732-3400 FAX:

Project: Vieques
Project Name Vieques / SWMU6 / 404422.FI.SW>S6

Report To: John Heyman, Ext 2
Report Level: 1
Report RLU or MDLU: RL U
J Code results between MDL and RL

	Sample ID	LabID	Collection Date	Date Needed	Mtx	Cont	Requested Tests: 6020	Requested Tests: ORP	Comments
1	VWW06-SD023-0211	350203701	2/8/2011 1:00:00 PM	2/24/2011	S	1	X		foreign samples
2	VWW06-SD023P-0211	350203702	2/8/2011 1:30:00 PM	2/24/2011	S	1	X		
3	VWW06-SD022-0211	350203703	2/8/2011 1:20:00 PM	2/24/2011	S	1	X		
4	VWW06-SD021-0211	350203704	2/8/2011 1:30:00 PM	2/24/2011	S	1	X		
5	VWW06-SD020-0211	350203705	2/8/2011 2:00:00 PM	2/24/2011	S	1	X		
6	VWW06-SD019-0211	350203706	2/8/2011 2:15:00 PM	2/24/2011	S	1	X		
7	VWW06-SD018-0211	350203707	2/8/2011 2:30:00 PM	2/24/2011	S	1	X		
J J	VWW06-SD018-0211MS	350203708	2/8/2011 2:30:00 PM	2/24/2011	S	1	X		
	VWW06-SD018-0211SD	350203709	2/8/2011 2:30:00 PM	2/24/2011	S	1	X		
8	VWW06-EB01-021011	350203710	~~2-8-11~~ 2-10-11 GOS NB 2-14-11	2/24/2011	W	1	X		

3502037

Comments:

	Date/Time		Date/Time
Relinquished by:	2-14-11 1720	**Received by:**	~~2/11/2011 5:27:41 PM~~ 2/15/11 8:52
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	

3°C

533

MITKEM LABORATORIES
Sample Condition Form

Received By: CAW | Reviewed By: SM | Date: 2/15/11 | Mitkem Work Order #: K0225

Client Project: Chain Vieques | Client: Pel

1) Cooler Sealed — ~~Yes~~ / No

2) Custody Seal(s) — ~~Present~~ / Absent; ~~Coolers~~ / Bottles; ~~Intact~~ / Broken

3) Custody Seal Number(s) — NA

4) Chain-of-Custody — ~~Present~~ / Absent

5) Cooler Temperature — 3° oc

IR Temp Gun ID — MT-1

Coolant Condition — Ice

6) Airbill(s) — ~~Present~~ / Absent

Airbill Number(s) — FedEx 4640 6770 0820

7) Samples Bottles — ~~Intact~~ / Broken / Leaking

8) Date Received — 2/15/11

9) Time Received — 8:52

Preservative Name/Lot No.:

Lab Sample ID		Preservation (pH) HNO_3	H_2SO_4	HCl	NaOH	H_3PO_4	VOA Matrix	Soil Headspace or Air Bubble ≥ 1/4"
K0225	01							
	02							
	03							
	04							
	05							
	06							
	07							
K0225	08	<2						

VOA Matrix Key:

US = Unpreserved Soil	A = Air
UA = Unpreserved Aqueous	H = HCl
M = MeOH	E = Encore
N = NaHSO4	F = Freeze

See Sample Condition Notification/Corrective Action Form yes / ~~no~~

Form ID: QAF.0006

Rad OK ~~yes~~ / no

\\Bernoulli\qa_safety\Controlled Forms\QAF.0006 sample condition form

MEMORANDUM **CH2MHILL**

Corrections to COCs

TO: John Heyman
PEL

COPIES: File
EDD
Data Package

FROM: Victoria Weber
Environmental Information Specialist
CH2M HILL

DATE: March 2, 2011

This memo is to document corrections made to entries on the Chains of Custody (COC) for Vieques SWMU 6, CTO-111.

The following Sample times need to be updated.

Correct Sample ID	Date	Correct Time	Incorrect Time
VWW06-SD018-0211	2/8/2011	16:30	14:30
VWW06-SD018-0211MS	2/8/2011	16:30	14:30
VWW06-SD018-0211SD	2/8/2011	16:30	14:30
VWW06-SD019-0211	2/8/2011	16:15	14:15
VWW06-SD020-0211	2/8/2011	16:00	14:00
VWW06-SD021-0211	2/8/2011	15:30	13:30
VWW06-SD022-0211	2/8/2011	15:20	13:20
VWW06-SD023-0211	2/8/2011	15:00	13:00
VWW06-SD023P-0211	2/8/2011	15:00	13:30

K0225
-07
-06
-05
-04
-03
-01
-02

COPYRIGHT 2011 BY CH2M HILL, INC. • COMPANY CONFIDENTIAL

Edward Lawler [Mitkem]

From: John Heyman [PEL]
Sent: Wednesday, March 02, 2011 10:40 AM
To: Edward Lawler [Mitkem]; Shirley Ng [Mitkem]; Yihai Ding [Mitkem]
Cc: Project Managers [PEL]
Subject: FW: Corrections Memo
Attachments: CTF_030211_vw.pdf

Please correct collecting times on the final reporting of 3502037(6020).
Thanks!
John

From: Vickie.Weber@ch2m.com [mailto:Vickie.Weber@ch2m.com]
Sent: Wednesday, March 02, 2011 10:30 AM
To: John Heyman [PEL]
Subject: Corrections Memo

Hello John,

Sorry for the delay in this correction, as I was going through the field notes from the project, I realized there were some time discrepancies. Please see the attached form for updates to sample times from the COC.

Let me know if you have questions or concerns.

Thanks!

Vickie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Monday, February 14, 2011 1:23 PM
To: Zamboni, Michael/WDC; Brynildsen, Victoria/VBO
Subject: 3502004 / Vieques / 7196A

Good morning.

Please note the following that will appear in the case narrative for method 7196 on SDG 3502004.

A. **Sample Analysis:** The following samples were analyzed out of hold: VWW06-EB01-020811, VWW06-SW019-0211, VWW06-SW020-0211, VWW06-SW021-0211, VWW06-SW022-0211, VWW06-SW023-0211, VWW06-SW023P-0211. The samples were received out of hold. The samples were analyzed as soon as possible to get as close to the holding time as possible. Samples were analyzed approximately 4 hours out of hold.

B. **Samples:**

Sample analysis proceeded normally.
Sample VWW06-SD015-0211 required a 10X dilution due to high concentration of the following analyte(s): Hexavalent Chromium.

093

YES NO N/A

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3502037 LAB: PEL

SITE NAME: SWMU 6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? ☑ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. VOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? ☑ ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? ☑ ___ ___

1.3 Sample Conditions/Problems

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ ☑ ___

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R".

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ".

sampled 2/10/11 analy 2/14/11
recd 2/11/11 temp 1.1°C

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? ___ ☑ ___

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

095

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	> 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	> 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	> 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water [✓] ___ ___

b. Soil [ ] ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water [✓] ___ ___

b. Soil [ ] ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, section 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. lab [✓] ___ ___

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? [ ] ___ [✓]

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2. [ ] [✓] ___

If yes, were samples reanalyzed? [ ] ___ [✓]

Were method blanks reanalyzed? [ ] ___ [✓]

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] ✓ ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Sample(Form III/Equivalent)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. [✓] ___ ___

098

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

A. Water [✓] ___ ___

B. Soil [ ] ___ ___

C. Med Soil [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ [✓]

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits. [ ] [✓] ___

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	**Non-Detected Spiked Compounds**
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

5.0 Matrix Spikes(Form III or equivalent)

no MS/MSD

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [ ] ___ ✓

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? [ ] ___ ✓

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

100

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

a. Water [ ] ___ ✓

b. Waste [ ] ___ ✓

c. Soil/Solid [ ] ___ ✓

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7)for each matrix. [ ] ___ ✓

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [ ] ___ ✓

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD results in conjunction with other QC criteria to determine the need for some qualification.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as well as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determine that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

YES NO N/A

6.0 Blank (CLP Form IV Equivalent)

6.1 Is the Method Blank Summary form present? ☑ ___ ___

6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ☑ ___ ___

6.3 Has a method blank been analyzed for each GC/MS system used ? ☑ ___ ___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject ® all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds? ☑ ___ ___

7.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. ☑ ___ ___

no qualifications required as only QC blks were in this data pkg.

YES NO N/A

7.2 Do any field/rinse blanks have positive volatile organic compound results? ✓ [ ] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

YES NO N/A

7.3 Are there field/rinse/equipment blanks associated with every sample? [ ] ___ ✓

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

only QC blks in this data pkg

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. [✓] ___ ___

NOTE: For the analysis of volatiles, the method requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? [✓] ___ ___

9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? [✓] ___ ___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) ☑ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? ☑ ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? ☑ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ ☑ ___

9.7 Have the appropriate number of significant figures (two) been reported? ☑ ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. ☑ ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

YES NO N/A

10.0 Target Analytes (CLP Form I Equivalent)

10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate ☑ ___ ___

b. Matrix spikes and matrix spike duplicates ☐ ___ ☑

c. Blanks ☑ ___ ___

d. Laboratory Control Samples ☑ ___ ___

10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate ☑ ___ ___

b. Matrix spikes and matrix spike duplicates (Mass spectra not required) ☐ ___ ☑

c. Blanks ☑ ___ ___

d. Laboratory Control Samples ☑ ___ ___

ACTION: If any data are missing, take action specified in 3.2 above.

10.3 Is chromatographic performance acceptable with respect to:

Baseline stability? ☑ ___ ___

	YES	NO	N/A
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		

Other:_____

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? ✓

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab for missing spectra.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? ✓

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? ✓

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? ✓

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

no TICs

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ✓

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ✓

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ✓ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? ✓ ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC accedence dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? ✓ ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? ✓ ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39) qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? ✓ ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. ✓ ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? [IV] ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] [✓] ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 GC/MS Calibration Verification (CLP Form VII Equivalent)

YES NO N/A

15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest? [✓] ___ ___

15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2). [ ] ✓ ___

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? ✓ ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? ✓ ___ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit

(Attach additional sheets if necessary.)

ACTION:
1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.
2. Do not qualify non-detects when the associated IS are counts area > + 100%.
3. If the IS area is below the lower limit (< -50%), qualify all associated non-detects (U-values) "J".
4. If extremely low area counts are reported (< -25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? Y ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? [ ] [✓] [ ]

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

Initial Calibration Date: 2/8/2011

RRF and %RSD Calculations:

Compound Name: vinyl chloride

Lab Value: 0.386

Area of Compound	788859
Area of Internal STD	1277822
Conc. of Internal STD	50
Conc. of Compound	80
Calculated RRF	0.386

Compound Name: ethylbenzene

Lab Value: 10.50

RRF of STD 1	0.470
RRF of STD 2	0.606
RRF of STD 3	0.533
RRF of STD 4	0.477
RRF of STD 5	0.429
RRF of STD 6	0.548
RRF of STD 7	0.539
RRF of STD 8	0.544
RRF of STD 9	0.570
Calculated % RSD	10.51

Continuing Calibration File ID: 2/14/2011

RRF and %D Calculations:

Compound Name: 4-methy-2-pentanone

Lab Value: 0.087

Area of Compound	195956
Area of Internal STD	1128191
Conc. of Internal STD	50
Conc. of Compound	100
Calculated RRF	0.087

Compound Name: ethylbenzene

Lab Value: 0.7

Average RRF	0.524
Calibration Check RRF	0.528
Calculated % D	-0.7

SAMPLE CALCULATION

Sample ID: VWW06-TB01-021011
Standard ID: 2/14/2011
Compound: acetone
Concnetration: 3.9J ug/L

	Water (ug/L)	Soil (ug/Kg)	Soil ug/Kg)
Area of Compound	6664		
Area of Internal STD	11240004		
Conc. of Internal (ng)	250		
RRF of Compound	0.07589		
Dilution Factor	1		
Weight of Sample	NA	25	
Volume of Sample	5	NA	
% Moisture	NA	0.79	
Aliquot of sample	NA	NA	
Concentration	0.39	#DIV/0!	#DIV/0!

	RT of Internal STD	RT of Compound	RRT
Sample	6.733	2.809	0.417
Standard	6.733	2.804	0.416

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA 8260B/SW846

IV. PREPARATION

Water samples were prepared by SW846/5030 for EPA8260B volatiles analysis. All aspects of sample preparation proceeded without exception.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met. Please note that:

Blank 021411BLKA32 was analyzed with the water samples on 02/14/11. The following analyte(s) were detected below RL: 1,2,4-Trichlorobenzene at 0.13 UG/L, Acetone at 3.7 UG/L.

No further action was necessary, since the detected hits are below the RL. Samples coded accordingly.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed. All percent recovery and relative percent difference (RPD) criteria were met.

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

2. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)**

No spikes requested by client.

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Lisa Pelo Title: VOA Manager

SIGNED: **DATE:** 03/02/2011

YES NO N/A

E - The concentration of this analyte exceeds the calibration range of the instrument.

A - Indicates a Tentatively Identified Compound (TIC) is a suspected adol-condensation product.

X,Y,Z- Laboratory defined flags. The data reviewer must change these qualifiers during validation so that the data user may understand their impact on the data.

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 3502037 LAB: PEL

SITE NAME: SWMU 6 CTO-111

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format? ✓ ___ ___

ACTION: If not, note the effect on review of the data in the data assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? ✓ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ✓ ___ ___

YES NO N/A

II. SEMIVOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? ✓ ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ ✓ ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, all non-detects data are qualified as unusable (R), and detects are flagged "J".

ACTION: If samples were not iced, or if the ice was melted upon arrival at the laboratory and the cooler temperature was elevated (10°C), flag all positive results "J" and all non-detects "UJ".

temp 1.1 °C

sampled 2/10/11 extr. 2/11/11
recd 2/11/11 analy 2/18/11

2.0 Holding Times

2.1 Have any semivolatile technical holding times, determined from date of collection to date of extraction, been exceeded? ___ ✓ ___

Continuous extraction of water samples for semivolatile analysis must be started within **7** days of the date of collection. Soil/sediment samples must be extracted within **14** days of collection. Extracts must be analyzed within

YES NO N/A

40 days of the date of extraction.

Table of Holding Time Violations

Sample ID	Sample Matrix	Date Sampled	Date Lab Received (See Traffic Report)	Date Extracted	Date Analyzed

ACTION: If technical holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

	YES	NO	N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Have the semi volatile surrogate recoveries been listed on CLP Surrogate Recovery forms (Form II) for each of the following matrices:

a. Low Water [✓] ___ ___

b. Low/Med Soil [ ] ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery Summary forms for each matrix:

a. Low Water [✓] ___ ___

b. Low/Med Soil [ ] ___ ___

ACTION: If CLP deliverables are unavailable, document the effect(s) in data assessments. In some cases the lab may have to be contacted to obtain the data necessary to complete the validation.

3.3 Were outliers marked correctly with an asterisk? [ ] ___ [✓]

ACTION: Circle all outliers in red.

3.4 Were two or more base neutral OR acid surrogate recoveries out of specification for any sample or method blank (Reviewer should use lab in house recovery limits. Use surrogate recovery limits from USEPA National Functional Guidlines January 2005 page 130, if in house limits are not available. See Method 8000B-43 or 80000C-24). [ ] [✓] ___

Note: Examine lab in house limits for reasonableness.

If yes, were samples re-analyzed? [ ] ___ [✓]

126

	YES	NO	N/A
Were method blanks re-analyzed?	[ ]	___	✓

ACTION: If all surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet method specifications, <u>for the affected fraction only (i.e. either base-neutral or acid compounds):</u>

1. Flag all positive results as estimated ("J").

2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.

3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any base-neutral <u>or</u> acid surrogate has a recovery of < 10%:

1. Positive results for the fraction with < 10% surrogate recovery are qualified with "J".

2. Non-detects for that fraction should be qualified as unusable (R) .

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

3.5 Are there any transcription/calculation errors between raw data and Form II?	___	✓	___

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and document

YES NO N/A

effect in data assessments.

no MS/MSD

4.0 Matrix Spikes (Form III/Equivalent)

4.1 Have the semivolatile Matrix Spike and Matrix Spike Duplicate/or duplicate unspiked Sample recoveries been listed on the Recovery Form (Form III)? [ ] ___ ✓

NOTE: Method 3500B/page 4 states the spiking compounds:

Base/neutrals	Acids
1,2,4-Trichlorobenzene	Pentachlorophenol
Acenaphthene	Phenol
2,4-Dinitrotoluene	2-Chlorophenol
Pyrene	4-Chloro-3-methylphenol
N-Nitroso-di-n-propylamine	4-Nitrophenol
1,4-Dichlorobenzene	

Note: Some projects may require the spiking of specific compounds of interest.

Note: See Method 8270D-sec 8.4.2 for deciding on whether to prepare and analyze duplicate samples or a martix spike/matrix spike duplicate. If samples are expected to contain target analytes, then laboratory may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, laboratory should use a matrix spike and matrix spike duplicate pair.

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [ ] ___ ✓

b. Low Solid [ ] ___ ✓

c. Med Solid [ ] ___ ✓

YES NO N/A

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above. It may be necessary to contact the lab to obtain the required data.

NOTE: If the data has not been reported on CLP equivalent form, then the laboratory must provide the information necessary to evaluate the spike recoveries in the MS and MSD. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

4.3 Were matrix spikes performed at concentration equal to 100ug/L for acid compounds, and 200ug/l for base compounds (Method 3500B-4), or those specified in project plan. [ ] ___ ✓

4.4 How many semivolatile spike recoveries are outside Laboratory in house MS/MSD recovery limits (use recovery limits values in Method 8270D-43&44 Table 6 if in house values not available).

Water

____ out of ____

Solids

____ out of ____

YES NO N/A

4.5 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Solids
____ out of ____	____ out of ____

ACTION: Circle all outliers with red pencil.

ACTION: No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the matrix spike and matrix spike duplicate results in conjunction with other QC criteria to determine the need for some qualification of the data.

4.6 Was a Laboratory Control Sample (LCS) analyzed with each analytical batch? IV ___ ___

NOTE: When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

5.0 Blanks (Form IV/Equivalent)

5.1 Is the Method Blank Summary (Form IV) present? IV ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported per 20 samples of similar matrix, or concentration level, and for each extraction batch? ✓ ___ ___

5.3 Has a method blank been analyzed either after

YES NO N/A

the calibration standard or at any other time during the analytical shift for each GC/MS system used ? [ ] ___ ✓

ACTION: If any method blank data are missing, call lab for explanation/resubmittal. If not available, use professional judgement to determine if the associated sample data should be qualified.

5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra.

Is the chromatographic performance (baseline stability) for each instrument acceptable for the semivolatiles? [✓] ___ ___

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. no qual - only QC blk in data pkg ___ [ ] ___

6.2 Do any field/rinse/ blanks have positive results for target analytes and/or TICs (if required, see section 10 below)? ___ [✓] ___

YES NO N/A

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks. If gross contamination exists, all data in the associated samples should be qualified as unusable (R).

YES NO N/A

Blank Action for Semivolatile Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification required
	< CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	= CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report concentration of sample with a U
		≥ CRQL and ≥ blank contamination	No qualification required

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: If the laboratory did not report TIC analyses, check the project plans to verify whether or not it was required.

6.3 Are there field/rinse/equipment blanks associated with every sample? [ ] ___ ✓

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

only QC blk in data pkg

6.4 Was a instrument blank analyzed after each sample/dilution which contained a target compound

	YES	NO	N/A
that exceeded the initial calibration range.	[ ]	___	✓
6.5 Does the instrument blank have positive results for target analytes and/or TICs?	___	[ ]	✓

Note: Use professional judgement to determine if carryover occurred and qualify analytes accordingly.

7.0 GC/MS Apparatus and Materials

7.1 Did the lab use the proper gas chromatographic column for analysis of semivolatiles by Method 8270D? Check raw data, instrument logs or contact the lab to determine what type of column was used. The method requires the use of 30 m x 0.25 mm ID (or 0.32 mm ID), silicone-coated, fused silica, capillary column.	[ ]	___	___

ACTION: If the specified column, or equivalent, was not used, document the effects in the data assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (Form V/Equivalent)

8.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for decafluorotriphenylphosphine (DFTPP)?	[✓]	___	___

NOTE: The performance solution should also contain 4,4-DDT, pentachlorophenol, and benzidine to verify injection port inertness and column performance. The degradation of DDT to DDE and DDD must be less than 20% total and the response of pentachlorophenol and benzidine should be within normal ranges for these compounds (based upon lab experience) and show no peak degradation or tailing before samples are analyzed. (see section 5.5

	YES	NO	N/A

page 8270D-12).

8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? ✓ ___ ___

8.3 Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument? ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable (R).

8.4 Have the ion abundances been normalized to m/z 198? ✓ ___ ___

8.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

	YES	NO	N/A

ACTION: If ion abundance criteria are not met, take action specified in section 3.2

8.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.) — ☑ —

8.7 Have the appropriate number of significant figures (two) been reported? ☑ — —

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document effect in data assessments.

8.8 Are the spectra of the mass calibration compound acceptable? ☑ — —

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

9.0 Target Analytes

9.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate ☑ — —

b. Matrix spikes and matrix spike duplicates ☐ — ☑

c. Blanks ☑ — —

9.2 Has any special cleanup, such as GPC, been performed on all soil/sediment sample extracts (see section 7.2, page 8270D-14)? ☐ — ☑

	YES	NO	N/A

ACTION: If data suggests that extract cleanup was not performed, use professional judgement. Make note in the data assessment narrative.

9.3 Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)			✓
c. Blanks	✓		

ACTION: If any data are missing, take action specified in 3.2 above.

9.4 Are the response factors shown in the Quant Report?	✓		
9.5 Is chromatographic performance acceptable with respect to:			
Baseline stability?	✓		
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		
Other:_____			

ACTION: Use professional judgement to determine the acceptability of the data.

9.6 Are the lab-generated standard mass spectra of identified semivolatile compounds present for

	YES	NO	N/A
each sample?	✓		

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the data assessment narrative. If spectra are missing, reject all positive data.

9.7 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	✓		
9.8 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?	✓		
9.9 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum?	✓		

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R), flagged "N" (Presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 9.7, 9.8, and 9.9.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

YES NO N/A

10.0 Tentatively Identified Compounds (TIC)

10.1 If Tentatively Identified Compounds were required for this project, are all Form Is, Part B present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier? NO TICs

NOTE: Review sampling reports to determine if the lab was required to identify non target analytes (refer to section 7.6.2,page 8270D-21).

10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following: [ ] ___ ✓

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by CAS #.

10.3 Are any target compounds from one fraction listed as TIC compounds in another (e.g., an acid compound listed as a base neutral TIC)? ___ [ ] ✓

ACTION: i. Flag with "R" any target compound listed as a TIC.

ii. Make sure all rejected compounds are properly reported in the other fraction.

10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the

	YES	NO	N/A
sample mass spectrum?	[ ]	___	✓
10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%?	[ ]	___	✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate and remove "JN". Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R."

11.0 Compound Quantitation and Reported Detection Limits

11.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	✓	___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

11.2 Are the method detection limits adjusted to reflect sample dilutions and, for soils, sample moisture?	✓	___	___

YES NO N/A

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original Form I (if present) and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red " X" across the entire page of all Form I's that should not be used, including any in the summary package.

12.0 Standards Data (GC/MS)

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant, Reports) present for initial and continuing calibration? ✓ ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

13.0 GC/MS Initial Calibration (Form VI/Equivalent)

13.1 Is the Initial Calibration Form (Form VI/ Equivalent) present and complete for the semivolatile fraction? ✓ ___ ___

ACTION: If any calibration forms or standard row data are missing, take action specified in 3.2 above.

13.2 Are all base neutral or acid RRFs > 0.050? ✓ ___ ___

YES NO N/A

Check the **average RRFs** of the four System Performance Check Compounds (SPCCs): N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and 4-nitrophenol. These compounds must have **average RRFs** greater than or equal to 0.05 before running samples and should not show any peak tailing.

ACTION: Circle all outliers in red.

ACTION: For any target analyte with **average RRF <0.05**

1. "R" all non-detects;

2. "J" all positive results.

13.3 Are response factors for base neutral or acid target analytes stable over the concentration range of the calibration (% Relative standard deviation [%RSD] < 20.0%)? ✓ ___ ___

NOTE: The % RSD for each individual Calibration Check Compound (CCC, Method 8270D-40 see Table 4) must be less than 30% before analysis can begin. If grater 30%, the lab must clean and recalibrate the instrument.

CALIBRATION CHECK COMPOUNDS

Base/Neutral Fraction	Acid Fraction
Acenaphthene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2,4-Dichlorophenol
Hexachlorobutadiene	2-Nitrophenol
Diphenylamine	Phenol
Di-n-octyl phthalate	Pentachlorophenol
Fluoranthene	2,4,6-Trichlorophenol

YES NO N/A

Benzo(a)pyrene

ACTION: If the %RSD for any CCC >30% and no corrective action taken, then "J" qualify all positive hits and "UJ" qualify all non-detects.

ACTION: Circle all outliers in red.

ACTION: If the % RSD is ≥ 20.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, flag all non- detect results for that analyte "R," unusable. Alternatively, the lab should calculate first or second order regression fit of the calibration curve and select the fit which introduces the least amount of error.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

13.4 Did the laboratory calculate the calibration curve by the least squares regression fit? ___ ✓ ___

13.5 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or % RSD? (Check at least two values but if errors are found, check more.) ___ ✓ ___

ACTION: Circle Errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in data assessments.

13.5 Do the target compounds for this SDG include Pesticides? [ ] ✓ ___

YES NO N/A

13.6 If the pesticide compounds include DDT, was the percent breakdown of DDT to DDD and DDE greater than 20%? ___ [ ] ✓

ACTION: If DDT percent breakdown exceeds 20%:

i. Qualify all positive results for DDT with "J". If DDT was not detected, but DDD and DDE results are positive, qualify the quantitation limit for DDT as unusable, "R".

ii. Qualify all positive results for DDD and DDE as presumptively present at an approximate concentration "JN".

14.0 GC/MS Calibration Verification (Form VII/Equivalent)

14.1 Are the Calibration Verification Forms (Form VII) present and complete for all compounds of interest? [✓] ___ ___

14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

_____

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed within twelve hours of every sample analysis,

144

	YES	NO	N/A
call lab for explanation/resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").			
14.3 Do any of the SPCCs have an RRF <0.05?	___	☑	___
If YES, make a note in data assessment if the lab did not take corrective action specified in section 7.4.4, page 8270D-18.	☐	☑	___
14.4 Do any of the CCCs have a %D between the initial and continuing RRF which exceeds 20.0%?			
ACTION: If yes, make a note in data assessment.			
14.5 Do any semivolatile compounds have a % Difference (% D) between the initial and continuing RRF which exceeds 20.0%?	___	☑	___
ACTION: Circle all outliers in red.			
ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated (J). When %D is above 90%, qualify all non-detects for that analyte as "R", unusable.			
14.6 Do any semivolatile compounds have a RRF < 0.05?	___	☑	___
ACTION: Circle all outliers in red.			
ACTION: If RRF < 0.05, qualify as unusable ("R") associated non-detects and "J" associated positive values.			
14.7 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or percent difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more).	___	☑	___

145

YES NO N/A

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect(s) in the data assessments.

15.0 Internal Standards (Form VIII)

15.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to + 100%) for each continuing calibration? ✓ ___ ___

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area	LowerLimit	Upper Limit

(Attach additional sheets if necessary.)

Note: Check Table 5, 8270D-41 for associated analytes.

ACTION: i. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard.

ii. Non-detects associated with IS > 100% should not be qualified.

YES NO N/A

iii. If the IS area is below the lower limit (<50%), qualify all associated non-detects (U-values) "J". If extremely low area counts are reported (<25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable (R).

15.2 Are the retention times of all internal standards within 30 seconds of the associated calibration standard? [✓] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Laboratory Control Samples (LCS)

16.1 Were any LCS samples run in order to verify analytes which failed criteria for spike recovery? [ ] ___ [✓]

16.2 Did the lab spike LCS sample spiked with the same analytes and the same concentrations as the matrix spike? [ ] ___ [✓] NO MS/MSD

16.3 Were the mean and standard deviation of all analytes within the QC acceptance ranges as shown in Table 6, 8270D-43? [✓] ___ ___

ACTION: If the recovery of any analyte falls out of the designated range, the analytical results for that compound is suspect and should be qualified "J" in the unspiked samples.

17.0 Field Duplicates

17.1 Were any field duplicates submitted for semivolatile analysis? [ ] [✓] 040611

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

Initial Calibration Date: 2/16/2011

RRF and %RSD Calculations:

Compound Name: napthalene
Lab Value: 1.067

Area of Compound	549958
Area of Internal STD	41245
Conc. of Internal STD	0.8
Conc. of Compound	10
Calculated RRF	1.067

Compound Name: benzo(g,h,i)perylene
Lab Value: 7.10

RRF of STD 1	1.571
RRF of STD 2	1.378
RRF of STD 3	1.222
RRF of STD 4	1.361
RRF of STD 5	1.268
RRF of STD 6	1.460
RRF of STD 7	1.375
RRF of STD 8	1.420
RRF of STD 9	1.432
RRF of STD 10	1.450
Calculated % RSD	7.10

Continuing Calibration File ID: 2/18/2011

RRF and %D Calculations:

Compound Name: benzo(k)fluroanthene
Lab Value: 1.816

Area of Compound	84195
Area of Internal STD	40380
Conc. of Internal STD	0.8
Conc. of Compound	1
Calculated RRF	1.668

Compound Name: phenanthrene
Lab Value: 1.6

Average RRF	1.12104
Calibration Check RRF	1.139
Calculated % D	-1.6

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8270D.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8270 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met with the exception of:
Blank 71154MB was analyzed with the water samples extracted on 02/11/11. The following analyte(s) were detected below RL: Phenanthrene at 0.022 UG/L.
Samples coded accordingly. Since this compound was only detected below the RL, no further action was taken.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

E. Internal Standards:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:

Name: Brian C. Spann **Title:** Lab Director

SIGNED: **DATE:**
03/04/2011

USEPA Region II
SW846 Method 8081B Pesticides

Date: October 2006
SOP HW-44, Rev.1.0

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 350302037
LAB: PEL SITE: Vieques SWMU 6

	YES	NO	N/A
1.0 Data Completeness and Deliverables			
1.1 Has all the data been submitted in CLP deliverable format?	[✓]		
1.2 Have any missing deliverables been received and added to the data package? Resubs/corrections rcd.	[ ]		✓

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative			
2.1 Is a laboratory narrative or cover letter present?	[✓]		
2.2 Are the case number and/or SDG number contained in the narrative or cover letter?	[✓]		
3.0 Data Validation Checklist			
3.1 Does this data package contain:			
Water data? (1 Rinse blk)	[✓]		
Waste data?	[ ]		✓
Soil/solid data?	[✓]		

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Tuesday, April 19, 2011 6:07 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs
Attachments: P1598.pdf; P1469.pdf; P4026.pdf; P3933.pdf; P3316.pdf; P2995.pdf; P1385.pdf; P1193.pdf; P2427.pdf; P2727.pdf; P2850.pdf; P1275.pdf; P1518.pdf; P1612.pdf

Jackie:
Good afternoon.
I have attached revised 8081/8082 prep logs. The Clean up used (if any) can be found in the 2nd to the last column on the Extraction Logs.
Please contact me with any questions or concerns.
These pages have been paginated with the SDG number at the bottom of each page for reference.
Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Friday, April 15, 2011 9:52 AM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Hi John,

Please tell me where I would find this information in the prep. logs. I see a list of solvents, etc. at the end of the extraction page but don't know if that indicates that something was done. For example – on the pesticides for SDG 3501993 p 2996 florisil is mentioned with a number. However, the statement below suggests that there was no florisil clean-up performed. I need to be able to see what you have done as Region II questions are very specific on their DV check-lists. If clean-ups are performed, exactly where would they be listed in the logs? Thanks for further clarification!

Jackie

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Friday, April 15, 2011 8:14 AM
To: John Heyman [PEL]; Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com; Mark Gudnason [PEL]
Subject: RE: Question RE- Pesticides & PCBs

Jackie:
Per our Lab Manager:

If we perform clean ups then:

Only copper clean ups performed on the 8081. If we perform any clean ups then all the samples and QC would go through the same clean up steps.
PCBs get copper and acid treated, again all QC receive the same treatment.

153

This should have been noted in the prep logs if performed.

Let me know if you need any additional information.

Thanks!
John

From: Mark Gudnason [PEL] **On Behalf Of** John Heyman [PEL]
Sent: Thursday, April 14, 2011 4:49 PM
To: Jacqueline Cleveland; John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: Question RE- Pesticides & PCBs

Jackie,

John has left for the day but will address this asap tomorrow.

Mark

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, April 14, 2011 4:07 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: FW: Question RE- Pesticides & PCBs
Importance: High

Hi John,

I am just verifying that you received the question noted below! Thank you.

Jackie

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Wednesday, April 13, 2011 8:04 PM
To: 'John Heyman [PEL]'
Cc: 'DataQual Environmental Services, LLC'; 'Michael.Zamboni@CH2M.com'; 'Vickie.Weber@ch2m.com'
Subject: Question RE- Pesticides & PCBs

Good Morning John,

Quick question on the extraction procedures for the Pesticides and PCBs. I need to know what clean-up procedures were used on the sample extracts and whether or not any QC checks were performed to verify the procedures. If there were clean-up checks (for example – florisil cartridge checks) please include results of those checks in your response. Thanks for your help!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: The following samples were re-prepped out of hold: VWW06-SD019-0211RE1, VWW06-SD021-0211RE1. These samples were originally extracted within holding time. Both sets of data are reported.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8081.

IV. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8081 semi-volatile analysis.
Water samples were prepared by SW846 EPA 3510 for 8081 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met with the exception of:
Sample VWW06-SD019-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 61.5 % with criteria of (70-125). This sample was re-extracted and analyzed out of holding time and had similar results. Both sets of data are reported.

Sample VWW06-SD019-0211RE1 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 63.8 % with criteria of (70-125).

Sample VWW06-SD021-0211 was recovered below criteria for the following surrogate(s): 2,4,5,6-tetrachloro-m-xylene at 58.6 % with criteria of (70-125). This sample was re-extracted and re-analyzed out of holding time. The re-extract passed all criteria. Both sets of data are reported.

Samples coded accordingly.

CASE NARRATIVE
GC/ECD SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

D. Spikes:

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
SD - VWW06-SD018-0211SD was analyzed with the soil samples extracted on 02/11/11. The following analyte(s) were recovered below criteria: 4,4'-DDT at 42 % with criteria of (45-140).

Since this was recovered slightly low and all other criteria were met, no further action was taken. Samples coded accordingly.

E. Internal Standards:

This method does not require the use of internal standards.

F. Samples:

Sample analysis proceeded normally.

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:
Name: Brian C. Spaan **Title:** Lab Director

SIGNED: **DATE:**
03/01/2011

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

MANUAL INTEGRATION SUMMARY

The following analytes were manually integrated by the chemist.

Sample: 71063LCSD Analyte: 2,4,5,6-tetrachloro-m-xylene Reason: Target peak was not integrated automatically by software generator
Sample: 71063LCSD Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71063LCSD Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71063LCSD Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71063LCSD Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71063LCSD Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71393LCSD Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71393LCSD Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71393LCSD Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71393LCSD Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71393LCSD Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: VWW06-SD018-0211SD Analyte: 2,4,5,6-tetrachloro-m-xylene Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: alpha-BHC Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: beta-BHC Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: delta-BHC Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Sample: VWW06-SD018-0211SD Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: gamma-BHC (Lindane) Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: Heptachlor Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD018-0211SD Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD019-0211RE1 Analyte: 2,4,5,6-tetrachloro-m-xylene Reason: Target peak was not integrated automatically by software generator
Sample: VWW06-SD021-0211RE1 Analyte: 2,4,5,6-tetrachloro-m-xylene Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV952474 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952474 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952474 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952474 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952474 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952475 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952475 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952475 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952475 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV952475 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV952476 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV952476 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV952476 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV952476 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV952476 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953638 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: alpha-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: beta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: delta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV953638 Analyte: gamma-BHC (Lindane) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Heptachlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV953638 Analyte: Methoxychlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: CCV953656 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953656 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953656 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953656 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953656 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953657 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953657 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953657 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953657 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953657 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953658 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953658 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953658 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953658 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953658 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953659 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV953659 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953659 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953659 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953659 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953660 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953660 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953660 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953660 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953660 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV953661 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955260 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955260 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955260 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955260 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955260 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955260 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955260 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV955261 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: alpha-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: beta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: delta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Endrin ketone Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: gamma-BHC (Lindane) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Heptachlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955261 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: beta-BHC Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV955262 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: gamma-BHC (Lindane) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955262 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: alpha-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: beta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: delta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV955263 Analyte: Endrin ketone Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: gamma-BHC (Lindane) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Heptachlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955263 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: CCV955273 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955273 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955273 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955273 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955273 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955274 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955274 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955274 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955274 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955274 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955275 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955275 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955275 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955275 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955275 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV955276 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955276 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955276 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955276 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV955276 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: EVA950476 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952468 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952468 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952468 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952469 Analyte: Endrin ketone Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: EVA952470 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA952471 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA952471 Analyte: Endrin ketone Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953642 Analyte: Endrin ketone Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953646 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953646 Analyte: Endrin ketone Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953647 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953647 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953647 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953647 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953648 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: EVA953648 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953648 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953648 Analyte: Endrin ketone Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953649 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953649 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA953649 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA955268 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA955268 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA955268 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA955268 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: EVA955269 Analyte: Endrin ketone Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: delta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: SSC955270 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Heptachlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955270 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955291 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955291 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955291 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955291 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955291 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955291 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955291 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: SSC955291 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD950457 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD950457 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950457 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950458 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD950459 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950459 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950460 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD950461 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950461 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950462 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD950463 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950463 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: 4,4'-DDD Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: 4,4'-DDE Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: 4,4'-DDT Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Aldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: alpha-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Dieldrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endosulfan I Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endosulfan II Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endosulfan sulfate Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endrin Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Endrin aldehyde Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: gamma-Chlordane Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950464 Analyte: Heptachlor epoxide Reason: Baseline integration, needs re-enforced due to interference on target peak

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD950464 Analyte: Methoxychlor Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-1 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-2 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-3 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-4 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD950487 Analyte: Toxaphene-5 Reason: Baseline integration, needs re-enforced due to interference on target peak
Calibration Sample: STD955224 Analyte: 2,4,5,6-tetrachloro-m-xylene(SURR) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955224 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD955225 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: beta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: delta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: gamma-BHC (Lindane) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: Heptachlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955225 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD955226 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955226 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955227 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD955228 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955228 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955229 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955230 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955230 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955230 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955230 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD955230 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: beta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: delta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: gamma-BHC (Lindane) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Heptachlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955231 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD955232 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955232 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD955233 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955233 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: alpha-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: beta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: delta-BHC Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: gamma-BHC (Lindane) Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Heptachlor Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD955235 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955235 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Endrin ketone Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955237 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: 4,4'-DDD Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: 4,4'-DDE Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: 4,4'-DDT Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Aldrin Reason: Target peak was not integrated automatically by software generator

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD955239 Analyte: alpha-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Dieldrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Endosulfan I Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Endosulfan II Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Endosulfan sulfate Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Endrin Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Endrin aldehyde Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: gamma-Chlordane Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Heptachlor epoxide Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955239 Analyte: Methoxychlor Reason: Target peak was not integrated automatically by software generator
Calibration Sample: STD955271 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955271 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955271 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955271 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955271 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955272 Analyte: Toxaphene-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955272 Analyte: Toxaphene-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955272 Analyte: Toxaphene-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955272 Analyte: Toxaphene-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD955272 Analyte: Toxaphene-5 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

These manual integrations have been reviewed and meet all criteria in accordance with PEL's SOP regarding manual integration.

Priscilla Conklin
Chemist

CHEMIST: **DATE:** 03/01/2011

Signature:
Name: Brian C. Spann **Title:** Lab Director

SECTION LEADER:
DATE: 03/01/2011

ORGANOCHLORINE PESTICIDE

	YES	NO	N/A
1.0 Traffic Reports and Laboratory Narrative			
1.1 Are ~~traffic report~~ and chain-of-custody forms present for all samples?	☑		
ACTION: If no, contact lab for replacement of missing or illegible copies.			
1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?		☑	
ACTION: If any sample analyzed as a soil, other than than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, all non detects are qualified as unusable, "R", and positive results flagged "J".			
ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".			
2.0 Holding Times			
2.1 Have any organochlorine pesticide technical holding times, determined from date of collection to date of extraction, been exceeded?	☑		
Water and waste samples for organochlorine pesticide analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.			

samples flagged for high % moisture — 750%

2 RE samples excluded for original

182

ACTION: Qualify sample results according to Table 1.

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J*	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

YES NO N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [✓] ___ ___

b. Soil/Solid [ ] ___ ___

3.2 Are all the pesticide samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ [✓]

c. Soil/Solid [✓] ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ lab limits for all samples, including MS and MSDs, LCSs and all blanks? [ ] [✓] ___

Note: Reviewer shall use lab in-house recover limits if available. In-house criteria should be examined for reasonableness.

TCMX & in 2

ACTION: Circle all outliers in red. Follow surrogate action Table 2.

3.5 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate action, Table 2 below.

2A

SOIL PESTICIDE ORGANIC SURROGATE RECOVERY

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI

Lab Code : PEL Case No. SAS No: SDG NO.: 3502037

Column(1): STX-CLP1 ID: 0.32 (mm) Column(2): STX-CLP2 ID: 0.32 (mm)

EPA Sample NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	TOT OUT	
71061MB	88.0	102.0					0	
71062LCS	76.7	106.0					0	
71063LCSD	87.6	110.0					0	
73006MB	81.8	101.0					0	
73007LCS	76.1	96.7					0	
73008LCSD	75.5	91.9					0	
VWW06-SD018-0211	79.8	72.0					0	
VWW06-SD018-0211MS	81.0	78.8					0	
VWW06-SD018-0211SD	75.9	76.5					0	
VWW06-SD019-0211	61.5 *	60.8					1	JMJ
VWW06-SD019-0211RE1	63.8 *	64.0					1	excluded
VWW06-SD020-0211	76.9	79.5					0	
VWW06-SD021-0211	58.6 *	80.0					1	JMJ
VWW06-SD021-0211RE1	71.9	77.0					0	
VWW06-SD022-0211	72.5	74.6					0	
VWW06-SD023-0211	81.5	90.2					0	
VWW06-SD023P-0211	80.4	84.9					0	

Control Limits

S1	= 2,4,5,6-tetrachloro-m-xylene	70 -	125
S2	= Decachlorobiphenyl	55 -	130

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

Control limit source: (lab/method) METHOD

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Form II

180311 1805

YES NO N/A

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample(LCS)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples. ✓ ___ ___

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

186

YES NO N/A

4.2 Were Laboratory Control Samples analyzed at the required concentration for all analytes of interest ~~as specified in Table 3 below.~~ ☑ ___ ___

per lab SOP & client SAP

Note: Use lab in-house criteria, if available.

Table 3. LCS Spiking Criteria

LCS Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml	Recovery Limits (%)
gamma-BHC	0.05	1	50-120
Heptachor epoxide	0.05	1	50-120
Dieldrin	0.01	1	30-130
4,4'-DDE	0.01	1	50-150
Endrin	0.01	1	50-120
Endosulfan sulfate	0.01	1	50-120
gamma-Chloradane	0.05	1	30-130
Tetrachloro-m-xylene(surrogate)	0.20	3	30-150
Decachlorobiphenyl (surrogate)	0.40	3	30-150

Note: The LCS might be spiked with the same analytes at the same concentration as the matrix spike.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed ~~in table above?~~ ☑ ___ ___

per lab SOP & client SAP

187

YES NO N/A

ACTION: For LCS % recovery not meeting the required recovery, follow the required action in Table 4 below.

Table 4. LCS Recovery Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Upper Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? ✓ ___ ___

NOTE: For soil and waste samples showing detectable amounts of organics, the lab may substitute replicate samples in place of the matrix spike (see page 8000B-40, section 8.5.3).

5.2 Have MS/MD or MS/MSD results been summarized on Form III/Equivalent? ✓ ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000B-39, section 8.5.])

		YES	NO	N/A
a.	Water	[ ]	___	✓
b.	Waste	[ ]	___	✓
c.	Soil/Solid	[✓]	___	___

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 We Were Matrix Spike Samples analyzed at the required concentration for all analytes of interest as specified ~~in Table 5 below.~~ per lab SOP & client SAP [✓] ___ ___

Note: Spiking analytes may differ from those in Table 5. Check QA project plan or task order.

Table 5. Matrix Spiking Criteria

Matrix Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml
gamma-BHC	0.05	1
Heptachor	0.05	1
Aldrin	0.05	1
Dieldrin	1.0	1
Endrin	1.0	1
4,4'-DDT	1.0	1

Note: For aqueous organic extractable, the spike concentration should be:

1) <u>For regulatory compliance monitoring</u> - the regulatory concentration limit or 1 to 5 times the expected background concentration, whichever is higher;

2) <u>For all other aqueous samples</u> - the larger of either 1 to 5 x times the expected background

YES NO N/A

concentration, or the same as the QC check sample concentration (see section 4 above);

3) For soil/solid and waste samples - the recommended concentration is 20 times the estimated quantitation limit (EQL).

No action is taken based on MS or replicate data alone. However, using informed professional judgement, the data reviewer may use the matrix spike or laboratory replicate results in conjunction with other QC criteria and determine the need for some qualification of the data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples.

5.5 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed ~~in Table 6 below~~. Per Lab SOP & client SAP [ ] ✓ ___ ___
DDT slightly ↓ in SD - NQ

Note: Use lab in-house criteria, if available.

Table 6. Matrix Spike Recovery Criteria

Compound	% Recovery Water	RPD Water	% Recovery Soil	RPD Soil
gamma-BHC	56-123	0-15	46-127	0-50
Heptachor	40-13	0-20	35-130	0-31
Aldrin	40-120	0-22	34-132	0-43
Dieldrin	52-126	0-18	31-134	0-38
Endrin	56-121	0-21	42-139	0-45
4,4'-DDT	38-127	0-27	23-134	0-50

NOTE: The actual number of MS analytes depends on the number analytes being measured (e.g., total number of MS plus MSD compounds). If only chlordane or toxaphene are the analytes of

3

PESTICIDE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.

VWW06-SD018-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques / SWMU6 / 404

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC.
alpha-BHC	60	0	51	85.2	60 - 125
beta-BHC	60	0	55	92.4	60 - 125
delta-BHC	60	0	58	98.0	55 - 130
gamma-BHC (Lindane)	60	0	51	85.2	60 - 125
Heptachlor	60	0	57	96.3	50 - 140
Aldrin	60	0	53	89.4	45 - 140
Heptachlor epoxide	60	0	48	80.7	65 - 130
Endosulfan I	60	0	50	84.2	15 - 135
Dieldrin	60	0	48	80.2	65 - 125
4,4'-DDE	60	0	49	82.7	70 - 125
Endrin	60	0	43	72.8	60 - 135
Endosulfan II	60	0	46	77.0	35 - 140
4,4'-DDD	60	0	53	89.4	30 - 135
Endosulfan sulfate	60	0	51	85.4	60 - 135
4,4'-DDT	60	0	27	45.6	45 - 140
Methoxychlor	60	0	47	79.5	55 - 145
Endrin aldehyde	60	0	33	55.5	35 - 145
gamma-Chlordane	60	0	55	93.0	65 - 125
alpha-Chlordane	60	0	49	81.5	65 - 120
Endrin ketone	60	0	44	74.0	65 - 135

Spike Recovery: 0 out of 20 outside limits

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

_____

Form III

180311 1805

PESTICIDE ORGANIC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

EPA Sample No.: VWW06-SD018-0211SD

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 /

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
alpha-BHC	59	49	82.6	4.0	30	60 - 125
beta-BHC	59	55	92.6	0.7	30	60 - 125
delta-BHC	59	61	103.0	4.5	30	55 - 130
gamma-BHC (Lindane)	59	50	83.9	2.4	30	60 - 125
Heptachlor	59	60	102.0	4.8	30	50 - 140
Aldrin	59	53	90.2	0.0	30	45 - 140
Heptachlor epoxide	59	46	78.0	4.2	30	65 - 130
Endosulfan I	59	49	82.7	2.6	30	15 - 135
Dieldrin	59	46	78.5	3.0	30	65 - 125
4,4'-DDE	59	48	81.0	2.9	30	70 - 125
Endrin	59	38	64.5	13.0	30	60 - 135
Endosulfan II	59	44	75.1	3.3	30	35 - 140
4,4'-DDD	59	52	88.3	2.1	30	30 - 135
Endosulfan sulfate	59	52	88.0	2.1	30	60 - 135
4,4'-DDT	59	25	42.0 *	9.2	30	45 - 140
Methoxychlor	59	47	79.2	1.3	30	55 - 145
Endrin aldehyde	59	32	54.1	3.4	30	35 - 145
gamma-Chlordane	59	52	88.5	5.8	30	65 - 125
alpha-Chlordane	59	47	79.9	2.9	30	65 - 120
Endrin ketone	59	43	72.3	3.2	30	65 - 135

NQ - MS OK

RPD: 0 out of 20 outside limits

Spike Recovery: 1 out of 20 outside limits

Results reported on Primary Column, if RPD >40% results flagged accordingly.

Column to be used to flag recovery values with an asterisk

* Values outside QC limits

Control limit source: (lab/method) METHOD

COMMENTS: _____

Form III

160311 1805

YES NO N/A

interest, the spiked sample should contain the most representative multi-component analyte.

ACTION: Follow the matrix spike actions (Table 7) for pesticide analyses.

Table 7. Matrix Spike Qualifying Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% R ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limit	No qualifications	

Note: When the results of the matrix spike analyses indicates a potential problem due to the sample matrix itself, the LCS results are used to verify the laboratory can perform analyses in a clean matrix.

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on Method Blank Summary form(s) (Form IV)? Yes

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ☑ ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any other time during the analytical shift.

YES NO N/A

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for pesticides? ✓ ___ ___

ACTION: Use professional judgement to determine the effect on the data.

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for organochlorine pesticides? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ ✓ ___

7.2 Do any field/rinse blanks have positive organochlorine pesticide results? ___ ✓ ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in

YES NO N/A

another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 8 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 8. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying the calibration criteria.

Note: When applied as described in Table 8 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams", "junk peaks"), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference.

YES NO N/A

Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic column used for the analysis of organochlorine pesticides? Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (See Method 8081B-8, section 4.2) ✓ ___ ___

8.2 If capillary columns were used, were they both wide bore (.53 mm ID) fused silica GC columns, such as DB-608 and DB-1701 or equivalent. Indicate the specific type of column used for:

column 1: STX-CLP1

column 2: STX-CLP2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. DDT/endrin breakdown check ✓ ___ ___

		YES	NO	N/A
b.	toxaphene	[ ]	___	___
c.	technical chlordane	[ ]	___	___
d.	5 pt. initial calibration standards	[ ]	___	___
e.	calibration verification standards	[ ]	___	___
f.	LCS	[ ]	___	___
g.	Method blanks	[ ]	___	___

ACTION: If no, take action specified in 3.2 above.

9.2 Has a DDT/endrin breakdown check standard (at the mid-concentration level) been analyzed at the beginning of each analytical sequence on both columns (page 8081B-24, section 8.2.3)? [ ] ___ ___

ACTION: If no, take action as specified in 3.2 above.

9.3 Has the individual % breakdown exceeded 20.0% on either column for:

- 4,4' - DDT? >15% in 1 std - NQ ___ [ ] ___
- endrin? ___ [ ] ___

ACTION: If any % breakdown has failed the QC criteria in the breakdown check standard, qualify all sample analyses in the entire analytical sequence as described below.

a. If 4,4'-DDT breakdown is greater than 20.%:

i. Qualify all positive results for DDT with 'J". If DDT was not detected, but DDD and DDE are positive, then qualify the quantitation limit for DDT as unusable ("R").

ii. Qualify positive results for DDD and DDE as presumptively present at an approximated quantity ("NJ").

PESTICIDE ORGANIC CALIBRATION VERIFICATION SUMMARY

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

GC Column: STX-CLP2 ID: 0.32 (mm) Init. Calib. Date: 02/15/11

EPA Sample No. (EVA): EVA953649 Date Analyzed: 02/23/11

Lab File ID (EVA): PEM3.D Time Analyzed: 2150

PEM COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	% BREAK-DOWN
endrin keton	9.00	8.91	9.11	
endrin	6.77	6.68	6.88	6.67
4,4'-DDT	7.35	7.26	7.46	17.85
4,4'-DDE	6.09	6.00	6.20	
4,4'-DDD	6.88	6.79	6.99	
			Combined % breakdown:	24.52

<- NQ

QC LIMITS:

4,4'-DDT breakdown must be less than or equal to 15.0%

Endrin breakdown must be less than or equal to 15.0%

Combined breakdown must be less than or equal to 30.0%

assoc with all soils — all results quanted from CLP 1 - CLP used for confirmation only - No Quals

YES NO N/A

b. If endrin breakdown is greater than 20.0%:

i. Qualify all positive results for endrin with "J". If endrin was not detected, but endrin aldehyde and endrin ketone are positive, then qualify the quantitation limit for endrin as unusable ("R").

ii. Qualify positive results for endrin ketone and endrin aldehyde as presumptively present at an approximated quantity ("NJ").

9.4 Are data summary forms (containing calibration factors or response factors) for the initial 5 pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? ✓ ___ ___

NOTE: If internal standard calibration procedure is used (page 8000B-16, section 7.4.2.2), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (page 8000B-16, section 7.4.2.1), then calibration factors must be used.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.5 Are there any transcription/calculation errors between raw data and data summary forms. ___ ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.6 Are standard retention time (RT) windows for each analyte of interest presented on modified CLP summary forms? ✓ ___ ___

YES NO N/A

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all pesticides are established using retention times from three calibration standards analyzed during the entire analytical sequence (page 8081B-15, section 7.4.6).

A 72 hr. sequence is not required with this method, however, the method states that best results are obtained using retention times which span the entire sequence; i.e., using the mid level from the 5 pt. calibration, one of the mid-concentration standards analyzed during mid-sequence and one analyzed at the end.

9.7 Were RT windows on the confirmation column established ~~using three standards as described above?~~ per lab SOP & AAP ✓ IM

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.6 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.8 Do all standard retention times in each level of the initial 5 pt. calibrations for pesticides fall within the windows established during the initial calibration sequence? ✓ IM ___ ___

ACTION: i. If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standards, spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows

206

YES NO N/A

may be too tight. If so, RT windows should be recalculated as per page 8081B-15, section 7.4.6.2

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

ACTION: For toxaphene and chlordane, the RT may be outside the RT window, but these analytes may still be identified from their individual patterns.

9.9 Has the linearity criteria for the initial calibration standards been satisfied for both columns? (% RSD must be < allowable limits* for all analytes). ✓ ___ ___

ACTION: If no, follow the actions in Table 9 below.

Table 9. Initial Calibration Linearity Criteria

Criteria	Criteria	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD exceeds allowable limits*	J	No qualification
% RSD within allowable limits*	NO qualifications	

* %RSD ≤ 20% for single component compounds except alpha-BHC and delta-BHC.
%RSD ≤ 25% for alpha-BHC and delta-BHC
%RSD ≤ 30% for Toxaphene peaks
%RSD ≤ 30% for surrogates(tetrachloro-m-xylene and decachlorobiphenyl).

9.10 Has a calibration verification standard containing all analytes of interest been analyzed on each

YES NO N/A

working day, prior to sample analyses (pages 8081B-15, sections 7.5.2)? [Y] ___ ___

9.11 Has a calibration verification standard also been analyzed after every 10 samples and at the end of each analytical sequence (page 8081B-15, section 7.5.2)? method says every 20 - satisfied [ ] ___ ✓

ACTION: If no, take action as specified in section 3.2 above.

9.12 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence (closing CCV). Has no more than 72 hours elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene CCV? [Y] ___ ___

ACTION: See Table 10 below.

9.13 Has the percent difference (%D) exceeded ± 20% for any organochlorine pesticide analyte in any calibration verification standard? ✓ [ ] ___ NQ - not assoc. with reported results

9.14 Has a new 5 pt. calibration curve been generated for those analytes which failed in the calibration verification standard (page 8081B-16, section 7.5.2.2), and all samples which followed the out-of-control standard (page 8081B-16, section 7.5.2.3) reinjected? [ ] ___ ✓

ACTION: If the %D for any analyte exceeded the ± 20% criterion and the instrument was not recalibrated for those analytes, see table below.

9.15 Have <u>daily</u> retention time windows been properly calculated for each analyte of interest (page 8081B-16, section 7.5.3)), using RTs from the associated mid concentration standard and standard deviation from the initial calibration)? [Y] ___ ___

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Instrument ID: SECD03 CalibrationDate: 02/23/11 Time: 0918

CCV ID: CCV953634 Lab File ID: PCCV1.D Init. Calib. Date Begin: 02/15/11 End: 02/15/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type	
alpha-BHC	20212.06	19251.175	4.8	AVRG	
beta-BHC	7753.3706	7283.075	6.1	AVRG	
delta-BHC	17810.738	16774.925	5.8	AVRG	
gamma-BHC (Lindane)	17589.736	16840.25	4.3	AVRG	
Heptachlor	17321.291	17037.15	1.6	AVRG	
Aldrin	16134.245	16009.775	0.8	AVRG	
Heptachlor epoxide	15607.071	14748.175	5.5	AVRG	
Endosulfan I	15369.842	14797.25	3.7	AVRG	
Dieldrin	15647.272	14941	4.5	AVRG	
4,4'-DDE	15767.434	14515.2	7.9	AVRG	
Endrin	13792.269	12653.7	8.3	AVRG	
Endosulfan II	13556.138	12584.9	7.2	AVRG	
4,4'-DDD	12724.532	11639.975	8.5	AVRG	
Endosulfan sulfate	12049.956	10741.25	10.9	AVRG	
4,4'-DDT	13475.465	12571.825	6.7	AVRG	
Methoxychlor	5990.5629	5691.6	5.0	AVRG	
Endrin aldehyde	11404.307	10259.95	10.0	AVRG	
gamma-Chlordane	12444.4	15438.85	24.1	AVRG	<- NQ
alpha-Chlordane	15211.453	14779.925	2.8	AVRG	
Endrin ketone	15637.093	14624.375	6.5	AVRG	
==========					
2,4,5,6-tetrachloro-m-xylene(SURR)	11253.768	12600.075	12.0	AVRG	
Decachlorobiphenyl(SURR)	13076.925	12770.7	2.3	AVRG	

Average Used: 6.8

No samples associated

7

PESTICIDE ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Instrument ID: SECD03 CalibrationDate: 03/01/11 Time: 1416

CCV ID: CCV955262 Lab File ID: PCCV3.D Init. Calib. Date Begin: 02/28/11 End: 02/28/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type	
alpha-BHC	26663.36	29178.35	9.4	AVRG	
beta-BHC	10811.872	10590.075	2.1	AVRG	
delta-BHC	24072.17	26720.3	11.0	AVRG	
gamma-BHC (Lindane)	23616.36	25549.925	8.2	AVRG	
Heptachlor	23381.881	26358.475	12.7	AVRG	
Aldrin	21955.49	24688.4	12.4	AVRG	
Heptachlor epoxide	20434.801	22150.05	8.4	AVRG	
Endosulfan I	19194.854	20986.275	9.3	AVRG	
Dieldrin	20281.624	21759.6	7.3	AVRG	
4,4'-DDE	19568.068	21799.75	11.4	AVRG	
Endrin	17859.469	17240.15	3.5	AVRG	
Endosulfan II	15206.897	17613.7	15.8	AVRG	
4,4'-DDD	14769.398	20142.975	36.4	AVRG	<- NQ
Endosulfan sulfate	15497.903	15505.65	0.0	AVRG	
4,4'-DDT	16913.945	18509.15	9.4	AVRG	
Methoxychlor	8149.391	9445.375	15.9	AVRG	
Endrin aldehyde	14161.456	13978.225	1.3	AVRG	
gamma-Chlordane	14330.089	18412.15	28.5	AVRG	<- NQ
alpha-Chlordane	19254.073	21233.6	10.3	AVRG	
Endrin ketone	19561.792	19650.4	0.5	AVRG	
==========					
2,4,5,6-tetrachloro-m-xylene(SURR)	13920.098	12886.95	7.4	AVRG	
Decachlorobiphenyl(SURR)	15768.447	18689.775	18.5	AVRG	

Average Used: 10.9

closing Std - a220c with RE samples which are not reported (excluded for originals)

180311 1805

FORM VII

Initial Calibration Date: 2/15/11, Instrument SECD03 - Column 1

RRF and %RSD Calculations:

Compound Name: alpha-BHC in level 3
Lab Value: 19045.7000

Area of Compound	190457
Conc. of Compound	10
Calculated CF	19045.700

Compound Name: alpha-BHC
Lab Value: 8.3

CF of STD 1	17263.000
CF of STD 2	18994.200
CF of STD 3	19045.700
CF of STD 4	20705.325
CF of STD 5	20526.900
CF of STD 6	22417.375
CF of STD 7	21183.580
CF of STD 8	21560.400
Calculated % RSD	8.26

Continuing Calibration File ID: 2/23/2011 @ 1800, file ID PCCV2.D

RRF and %D Calculations:

Compound Name: methoxychlor
Lab Value: 5124.5750

Area of Compound	204983
Conc. of Compound	40
Calculated CF	5124.575

Compound Name: methoxychlor
Lab Value: 14.5

Average CF	5990.563
CF of CCV	5124.575
Calculated % D	14.5

YES NO N/A

ACTION: If no, take action specified in section 3.2 above or recalculate RT windows using the procedure outlined in method 8081B-16, section 7.5.3.

9.16 Do all standard retention times for each mid concentration standard fall within the windows established during the initial calibration sequence?

[ ] ___ ✓

fall within daily

9.17 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows (page 8081B-16, section 7.5.3)?

✓ [ ] ___ ___

ACTION: If the answer to either 9.15 or 9.16 above is no, check the chromatograms of all samples which followed the last in-control standard. All samples analyzed after the last in-control standard must be re-injected, if initial analysis indicated the presence of the specific analyte that exceeded the retention time criteria (page 8081B-18, section 7.5.7.). If samples were not re-analyzed, document under Contract Non-compliance in the Data Assessment.

Reviewer has two options to determine how to qualify questionable sample data. First option is to determine if possible peaks are present within daily retention time window. If no possible peaks are found, non-detects are valid. If possible peaks are found (or interference), qualify positive hits as presumptively present "NJ" and non-detects are rejected "R". Second option is to use the ratio of the retention time of the analyte over the retention time of either surrogate. The passing criteria is ± 0.06 RRT units of the RRT of the standard component. Reject "R" all questionable analytes exceeding criteria, and "NJ" all other positive hits.

For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use option 2 specified in paragraph above.

206

YES NO N/A

See Table 10 below.

Table 10. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RT out of RT window	Use professional judgement	
%D not within +/- 20%	J	UJ
Time elapsed greater than section 9.12 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.18 Are there any transcription/calculation errors between raw data and data summary forms? ___ ✓ ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? ✓ ___ ___

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? ✓ ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it

YES NO N/A

accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

11.0 Extraction Method Cleanup Efficiency Verification (Form IX/Equivalent)

11.1 Method 8081B permits a variety of extraction techniques to be used for sample preparation. Which extraction procedure was used?

1. Aqueous samples:

1. Separatory funnel (Method 3510) ✓

2. Continuous liquid-liquid extraction (Method 3520) _____

3. Solid phase extraction (Method 3535) _____

4. Other _____

2. Solid samples:

1. Soxhlet (Method 3540) _____

2. Automated Soxhlet (Method 3541) _____

3. Pressurized fluid (Method 3545) _____

4. Microwave extraction (Method 3546) _____

5. Ultrasonic extraction (Method 3550) ✓

6. Supercritical fluid (Method 3562) _____

7. Other _____

11.2 Is Form IX - Pest-1/Equivalent present and complete for each lot of Florisil/Cartridges used? (Florisil Cleanup, Method 3620A, is required for all organochlorine pesticide extracts.) [ ] ___ ✓

YES NO N/A

ACTION: If no, take action specified in 3.2 above. If data suggests that florisil cleanup was not performed, make note in the reviewer narrative.

NOTE: Method 3620A uses Florisil, while the SOW/CLP allows for Florisil cartridges. Method 3620A does not list which pesticides and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct pesticide list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.3 Are all samples listed on modified CLP Pesticide Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.4 If GPC Cleanup was performed, is Form IX - Pest-2/ Equivalent present? [ ] ___ ___ ✓

ACTION: If GPC was not performed and sample results indicate significant sulfur interference, make note in the data assessment.

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.5 Were the same compounds on Form IX used to check the efficiency of the cleanup procedures? [ ] ___ ___ ✓

11.6 Are percent recoveries (% R) of the pesticide and surrogate compounds used to check the efficiency of the cleanup procedures within QC limits listed on Form IX:

80-120% for florisil cartridge check? [ ] ___ ___ ✓

80-110% for GPC calibration? [ ] ___ ___ ✓

YES NO N/A

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 80%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for pesticide compounds. Qualify positive results "J" (estimated).

NOTE: If 2,4,5-trichlorophenol was used to measure the efficiency of the Florisil cleanup and the recovery was > 5%, sample data should be evaluated for potential interferences.

12.0 Pesticide Identification

12.1 Has CLP Form X, showing retention time data for positive results on the two GC columns, been completed for every sample in which a pesticide was detected? ✓ ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and Florisil cleanup verification forms)? ___ ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both analyses? ✓ ___ ___

Note: Confirmation can be supported by other qualitative techniques such as GC/MS (Method 8270), or GC/AED (Method 8085) if sensitivity permits.

YES NO N/A

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently (see section 9.7 above). Also check for false negatives among the multiple peak compounds toxaphene and chlordane. Were there any false negatives? ✓ __ [ ] __

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation used as the second column Confirmation? (This is not required). [ ] __ ✓ __

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%?~~ <40% per method [✓] X __ X1 Corr JAC 41411

NOTE: The method 8081B requires quantitation from one column. The second column is to confirm the presence of an analyte. Calibration for the Confirmation column is a one point calibration. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

211

YES NO N/A

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier
0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected) "NJ"	
>50% (Pesticide vale is <CRQL)	"U"
>201%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that the higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ N ___

NOTE: Single-peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

212

SAMPLE CALCULATION

Sample ID: VWW6-SD018-0211MS
Standard ID: ICAL 2/15/11
Compound: 4,4'-DDD
Concentration: 53 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		568722
CF of Compound		12724.5325
Final Volume		10
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	33.01
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.254
Concentration	#DIV/0!	53.30635

YES NO N/A

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? ✓ ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? ✓ ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ ✓ ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for organochlorine pesticide analysis? ✓ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

214

DataQual **Pesticides**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD023-0211
Duplicate Sample ID: VWW06-SD023P-0211

Water: RPD>20%
Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
4,4'-DDE			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample.

Sample ID:
Duplicate Sample ID:

Water: RPD>20%
Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
4,4'-DDE			#DIV/0!
4,4'-DDD			#DIV/0!
4,4'-DDT			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: No qualifications were required.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made to determine the proper identification of field duplicates.

Yes NO N/A

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# 3502037

LAB: PEL SITE: Vieques SWMU 6

1.0 Data Completeness and Deliverables

1.1 Has all the data been submitted in CLP deliverable format? ☑ ___ ___

1.2 Have any missing deliverables been received and added to the data package? / ___ ___ ✓

Resubs / corrections ncd.

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? ☑ ___ ___

2.2 Are the case number and/or SDG number contained in the narrative or cover letter? ☑ ___ ___

3.0 Data Validation Checklist

3.1 Does this data package contain:

Water data? ✓ Rinse blk ___ ___

Waste data? ___ ✓

Soil/solid data? ✓ ___

POLYCHLORINATED BIPHENYLS

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? ☑ ___ ___

217

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8082 for Aroclor analysis.

IV. PREPARATION

Water samples were prepared by SW846 EPA 3510 for 8082 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

PCB 1016 and PCB 1260 were used as the spiking solution for all QC spikes.

1. Laboratory Control Spikes (LCS)

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

No spikes requested by client.

E. Internal Standards:

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

This method does not require the use of internal standards.

F. Samples:

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:

Name: Brian C. Spaniol Title: Lab Director

SIGNED: **DATE:** 03/03/2011

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

MANUAL INTEGRATION SUMMARY

The following analytes were manually integrated by the chemist.

Calibration Sample: CCV950344 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950344 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV950345 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950345 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV950346 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV951198 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951198 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951199 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV951206 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951206 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949188 Analyte: 1232-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949188 Analyte: 1232-2 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949188 Analyte: 1232-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1221-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1221-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1221-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949197 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949199 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949200 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-3 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949243 Analyte: 1254-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949263 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949267 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change

These manual integrations have been reviewed and meet all criteria in accordance with PEL's SOP regarding manual integration.

Signature:
Name: Brian C. Spaan **Title:** Lab Director

CHEMIST: **DATE:**
02/23/2011

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Signature: _____

Name: Brian C. Spaan **Title:** Lab Director

SECTION LEADER:
DATE: 02/23/2011

CASE NARRATIVE
POLYCHLORINATED BIPHENYLS (PCB) SEMIVOLATILE ORGANIC

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

EPA SW846 8082 for Aroclor analysis.

IV. PREPARATION

Soil samples were prepared by SW846 EPA 3545 for 8082 semi-volatile analysis.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Surrogates:

All acceptance criteria were met.

D. Spikes:

PCB 1016 and PCB 1260 were used as the spiking solution for all QC spikes.

1. Laboratory Control Spikes (LCS)

All acceptance criteria were met

2. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD)

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

E. Internal Standards:

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

This method does not require the use of internal standards.

F. Samples:

Data was collected using dual column analysis. Results reported from the primary column if the %D between the two columns is >40%, data is coded.

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:
Name: Brian C. Spann Title: Lab Director

SIGNED: **DATE:**
03/03/2011

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

MANUAL INTEGRATION SUMMARY

The following analytes were manually integrated by the chemist.

Sample: 71042LCS Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Sample: 71042LCS Analyte: Decachlorobiphenyl Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV951190 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951190 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951191 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951191 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951191 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951191 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951191 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951191 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951192 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951192 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951192 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951193 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951193 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951193 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951193 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951193 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951193 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951194 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951194 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951195 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV951195 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951195 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951195 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951195 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951195 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951196 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951197 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951197 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951197 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV951200 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951200 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951201 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951201 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951201 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: CCV951202 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951202 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: CCV951203 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949206 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: SSC949279 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: SSC949279 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949188 Analyte: 1232-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949188 Analyte: 1232-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949188 Analyte: 1232-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1221-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1221-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1221-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949193 Analyte: 1254-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949197 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949198 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949198 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949199 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949200 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949200 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949201 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949238 Analyte: 1232-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-2 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949240 Analyte: 1248-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949240 Analyte: 1248-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1221-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949243 Analyte: 1254-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949262 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949263 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949263 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949264 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

Calibration Sample: STD949264 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949266 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1016-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-1 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-2 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-3 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-4 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: 1260-5 Reason: Range method-surrogates were not properly identified denoting a manual change
Calibration Sample: STD949267 Analyte: Decachlorobiphenyl(SURR) Reason: Range method-surrogates were not properly identified denoting a manual change

CASE NARRATIVE

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

These manual integrations have been reviewed and meet all criteria in accordance with PEL's SOP regarding manual integration.

CHEMIST: **DATE:**
02/23/2011

SECTION LEADER:
DATE: 02/23/2011

Yes NO N/A

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ___ ✓ ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, non detects shall be qualified as unusable, "R."

all SD > 50% moisture - J/UJ

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any PCB technical holding times, determined from date of collection to date of extraction, been exceeded? ___ ✓ ___

Water and waste samples for PCB analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction. Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

ACTION: If technical holding times are exceeded, flag all positive results as estimated, "J," and sample quantitation limits "UJ" and document in the narrative that holding times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all the data should at least be

245

Yes NO N/A

qualified "J", but the reviewer may determine that non-detects are unusable, "R." (Table 1)

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste

246

Yes NO N/A

b. Soil/Solid [✓] ___ ___

3.2 Are all the PCB samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ [✓]

c. Soil/Solid [✓] ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ per SOP or SAP for all samples, including MS and MSDs, LCSs and all blanks? [✓] ___ ___

Note: Reviewer shall use lab in-house recovery limits, if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate criteria, Table 2.

Note: DCB is used when PCBs are determined as Aroclors. DCB is the internal standard when determining PCB congeners and TCMX the surrogate.

3.4 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate criteria, Table 2.

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement

		Yes NO N/A
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample (LCS)

4.1 Are raw data and percent recoveries present for all Laboratory Control samples as required by Method 8000B (section 8.5) and Method 8082A (section 8.4.2)? [✓] ___ ___

Verify that QC check samples were extracted and analyzed by the same procedures used for the actual samples.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation/ resubmittals. Make note in the data assessment.

NOTE: For aqueous samples, an additional QC check sample must be prepared and analyzed when any analyte in a matrix spike fails the required acceptance criteria (see section 5.3 below).

Yes NO N/A

The additional QC check sample must contain each analyte that failed in the MS analysis.

Note: When the results for matrix spike analysis indicates a problem due to sample matrix effects, the LCS results are used to verify the laboratory can perform the analysis in a clean sample.

4.2 Were Laboratory Control Samples analyzed at the required concentration as specified ~~in Method 8000B(sec 8.5)~~ for all analytes as specified in Table 3. lab SOP & client SAP [✓] ___ ___

Note: Use lab in-house criteria, if available.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Were the LCS recoveries within the percent recoveries as specified ~~in Table 3.~~ lab SOP & client SAP [✓] ___ ___

Table 3. LCS Criteria

Compound	% Recovery
Aroclor 1016	50-150
Aroclor 1260	50-150
Tetrachloro-m-xylene (surrogate)	30-150
decachlorobiphenyl (surrogate)	30-150

4.4 If no, were Laboratory Control Samples re-analyzed? [ ] ___ ___ ✓

ACTION: If QC check samples were not re-analyzed, or a general system problem is indicated by repeated failure to meet the QC acceptance criteria specified in the method, make note in the data assessment and use Table 4 recovery actions criteria.

Yes NO N/A

Table 4. LCS Recovery Actions

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Lower Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for one matrix spike and matrix duplicate (unspiked) pair (MS/Dup) or matrix spike/matric spike duplicate (MS/MSD)present and complete for each matrix (Method 8082A Section 8.4.1)? ☑ ___ ___

NOTE: For soil and waste samples showing detectable amounts of target analytes, the lab may substitute replicate samples in place of the matrix spike (see Method 8000B-40, section 8.5.3).

5.2 Have MS/Dup or MS/MSD results been summarized on modified CLP Form III? ☑ ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/Dup, MS/MSD must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month (Method 8000B-39 (section 8.5)).

X1 Corr JAC 4/14/11

a. Water ☑ ___ ☑

Yes NO N/A

b. Waste [ ] ___ ___

c. Soil/Solid [✓] ___ ___

ACTION: If any MS/Dup or MS/MSD data are missing, take the action specified in 3.2 above.

5.4 Were ~~Laboratory Control Samples~~ MS/MSD analyzed for all analytes as specified in Table 5, or did the lab use the optional QC acceptance criteria i.e., ~~in-house criteria~~? [✓] ___ ___

List the criteria used and make note in data assessment.

Criteria used 1016 40-140
1260 60-130

Table 5. MS/MSD Criteria

Compound	Percent Recovery QC Limits	RPD
Aroclor 1016	29-135	0-15
Aroclor 1260	29-135	0-20

5.5 Was the matrix spike prepared at the proper spike concentration? (Method 8000B, section 8.5.1-8.5.2) [ ] ___ ___

For aqueous organic extractable, the spike concentration should be prepared according options in: Method 8000B-40, (section 8.5.1 and 8.5.2). lab SOP / client SAP used

5.6 Were the matrix spike and matrix spike duplicate recovery and RPD limits met as specified in ~~Table 5.~~ Note: No qualification of the data is necessary on MS and MSD data alone. Use professional judgement to use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If any MS and MSD, percent recovery, or RPD results in the Arcolor fraction is out of specification (Table 5), qualify data to include the consideration of the existence interference in the raw data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples. Use professional judgement to determine the need for qualifications of detects of non-spiked compounds.

Yes NO N/A

Table 6. MS/MSD Actions for Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on CLP equivalent Method Blank Summary form(s) (Form IV)?

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch?

Note: Method blank should be analyzed, either after the calibration standard or at any time during the analytical shift.

ACTION: If any blank data are missing, take action as specified above (section 3.2) . If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system

Yes NO N/A

printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for PCBs? ✓ ___ ___

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ ✓ ___

7.2 Do any field/rinse blanks have positive PCB results? ___ ✓ ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 7 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 7. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples

Yes NO N/A

Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying for calibration criteria.

Note: When applied as described in Table 7 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

Yes NO N/A

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic capillary column used for the analysis of PCBs? ☑ ___ ___

Action: Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (Method 8082, section 4.2)

8.2 Indicate the specific type of narrow bore or wide bore (.53 mm ID, fused silica GC columns, such as DB-608 and DB-1701 or equivalent).

column 1: STX CLP1

column 2: STX CLP 2

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. Samples ☑ ___ ___

b. All blanks ☑ ___ ___

c. Matrix spike samples ☑ ___ ___

d. 5 pt. initial calibration standards ☑ ___ ___

e. calibration verification standards ☑ ___ ___

f. Laboratory Control samples (LCS) ☑ ___ ___

ACTION: If no, take action specified in 3.2 above.

9.2 Are data summary forms (containing calibration factors or response factors) for the initial 5

Yes NO N/A

pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? ✓ — —

Note: Calibration Aroclor mixtures other than 1016/1260 may be used (as per approved project QA plan)

NOTE: If internal standard calibration procedure is used (Method 8000B-15(section 7.4.2.2)), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (Method 8000B-16 (section 7.4.2.1)), then calibration factors must be used. The internal standard approach is highly recommended for PCB congener analysis.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.3 Are there any transcription/calculation errors between raw data and data summary forms? — ✓ —

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.4 Are standard retention time (RT) windows for each PCB peak of interest presented on modified CLP summary forms? ✓ — —

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all PCBs are established using retention times from three calibration standards analyzed during the entire analytical sequence (Method 8000B, section 7.6). Best results are obtained

Yes NO N/A

using retention times which span the entire sequence; i.e., using the calibration verification/continuing calibration standards analyzed every 12 hours.

9.5 Were RT windows on the confirmation column established ~~using three standards as described~~ above? per lab SOP ✓ — —

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.4 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.6 Do all standard retention times in each level of the initial 5 pt. calibrations for PCBs fall within the windows established during the initial calibration sequence? ✓ — —

ACTION i: If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standard spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows may be too tight. If so, RT windows should be recalculated as per Method 8081B-15 (section 7.4.6).

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

9.7 Has the linearity criteria for the initial calibration standards been satisfied for both

Yes NO N/A

columns? (% RSD for the calibration factors (CFs) for the three to five major peaks of each of the Aroclor compounds must be < 20.0%). [✓] ___ ___

ACTION: If no, follow Table 8 criteria.

Table 8. Initial Calibration CF Action for Aroclor Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD > 20%	J	UJ
% RSD within allowable limits	No qualifications	

9.8 Does the calibration verification/continuing calibration standard contain the PCB peaks of interest, analyzed on each working day, prior to sample analyses (Method 8082, sections 7.6.2)? [✓] ___ ___

9.9 Has a calibration verification/continuing calibration standard been analyzed after every ~~10~~ 20 samples per method and at the end of each analytical sequence (Method 8082A, section 7.6.2). [✓] ___ ___

ACTION: If no, take action as specified in section 3.2 above.

9.10 Has the percent difference (%D) between the Calibration Factor (CF) of each of the three to five peaks used to identify the Aroclor in the CCV and the CF from these peaks in the initial calibration exceeded ~~± 15%~~ 20% per method. AVG used [✓] ___ ___

9.11 Has a new 5 pt. initial calibration curve been generated for those PCB analytes which failed in the calibration verification/continuing calibration standard (8000B, section 7.7.3), and all samples which followed the out-of-control

Initial Calibration Date: 2/10/11-2/13/11, on STX-CLP1

RRF and %RSD Calculations:

Compound Name: AR1260 peak 2 in level 2

Lab Value: 8834600.0000

Area of Compound	176692
Conc. of Compound	0.02
Calculated CF	8834600.000

Compound Name: AR1260 Peak 2

Lab Value: 10.2

CF of STD 1	9755833.333
CF of STD 2	8834600.000
CF of STD 3	8231710.000
CF of STD 4	7482520.000
CF of STD 5	7794005.000
CF of STD 6	7773178.000
CF of STD 7	
CF of STD 8	
Calculated % RSD	10.22

Continuing Calibration File ID: 2/12/11, 0324, STX-CLP1

RRF and %D Calculations:

Compound Name: AR1260, peak 1

Lab Value: 5422270.0000

Area of Compound	542227
Conc. of Compound	0.1
Calculated CF	5422270.000

Compound Name: AR1260, peak 1

Lab Value: 13.1

Average CF	4793066.100
CF of CCV	5422270
Calculated % D	-13.1

7

PCB ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Instrument ID: SECD04 CalibrationDate: 02/11/11 Time: 2022

CCV ID: CCV951190 Lab File ID: ACCV1.D Init. Calib. Date Begin: 02/10/11 End: 02/10/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
1260-1	4793066.1	5241300	9.4	AVRG
1260-2	8311974.4	9025190	8.6	AVRG
1260-3	7567924.6	8597390	13.6	AVRG
1260-5	10214508	11305880	10.7	AVRG
1016-1	3401564.7	3389880	0.3	AVRG
1016-2	7053800.3	7792280	10.5	AVRG
1016-3	3007245.3	3580160	19.1	AVRG
1016-4	2893564	3402720	17.6	AVRG
1016-5	1719521.1	2072810	20.5	AVRG
1260-4	20944279	23821030	13.7	AVRG
==========	==========	==========	==========	==========
Decachlorobiphenyl(SURR)	26377561	31465600	19.3	AVRG

Average Used: 13

<- NQ - Avg OK

180311 1806

FORM VII

7

PCB ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Instrument ID: SECD04 CalibrationDate: 02/12/11 Time: 0324

CCV ID: CCV951196 Lab File ID: ACCV4.D Init. Calib. Date Begin: 02/10/11 End: 02/10/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
1260-1	4793066.1	5422270	13.1	AVRG
1260-2	8311974.4	9186590	10.5	AVRG
1260-3	7567924.6	8858360	17.1	AVRG
1260-5	10214508	11876570	16.3	AVRG
1016-1	3401564.7	3488980	2.6	AVRG
1016-2	7053800.3	7759460	10.0	AVRG
1016-3	3007245.3	3689590	22.7	AVRG
1016-4	2893564	2890200	0.1	AVRG
1016-5	1719521.1	2094710	21.8	AVRG
1260-4	20944279	24645110	17.7	AVRG
==========	==========	==========	==========	==========
Decachlorobiphenyl(SURR)	26377561	29886280	13.3	AVRG

Average Used: 13.2

<- NQ - avg OK

<- NQ avg OK

7

PCB ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Instrument ID: SECD04 CalibrationDate: 02/12/11 Time: 0324

CCV ID: CCV951197 Lab File ID: ACCV4.D Init. Calib. Date Begin: 02/10/11 End: 02/10/11

GC Column: STX-CLP2 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
1260-1	2394455.9	2889900	20.7	AVRG
1260-2	3368529.1	3951010	17.3	AVRG
1260-3	2173314.4	2355490	8.4	AVRG
1260-5	3160339.4	3500540	10.8	AVRG
1016-1	1919043.5	2231220	16.3	AVRG
1016-2	4506721.6	5107520	13.3	AVRG
1016-3	1712205.6	1928660	12.6	AVRG
1016-4	1346229	1518090	12.8	AVRG
1016-5	1750640.6	1491200	14.8	AVRG
1260-4	3159876.1	3758980	19.0	AVRG
==========	==========	==========	==========	==========
Decachlorobiphenyl(SURR)	13493929	15797980	17.1	AVRG

Average Used: 14.8

<- NQ - Avg OK

7

PCB ORGANIC CONTINUING CALIBRATION DATA

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Instrument ID: SECD04 CalibrationDate: 02/14/11 Time: 1559

CCV ID: CCV951202 Lab File ID: ACCV2.D Init. Calib. Date Begin: 02/10/11 End: 02/10/11

GC Column: STX-CLP1 ID: 0.32 (mm)

COMPOUND	Expected	Found	%D / %Drift	Curve Type
1260-1	4793066.1	4802620	0.2	AVRG
1260-2	8311974.4	7919930	4.7	AVRG
1260-3	7567924.6	8091240	6.9	AVRG
1260-5	10214508	9998430	2.1	AVRG
1016-1	3401564.7	3897010	14.6	AVRG
1016-2	7053800.3	8700120	23.3	AVRG
1016-3	3007245.3	3353890	11.5	AVRG
1016-4	2893564	3166300	9.4	AVRG
1016-5	1719521.1	1893590	10.1	AVRG
1260-4	20944279	21427900	2.3	AVRG
Decachlorobiphenyl(SURR)	26377561	26206920	0.6	AVRG

Average Used: 7.8

<- NQ - Avg OK

180311 1806

FORM VII

Yes NO N/A

calibration verification/standard continuing calibration Standard? [ ] __ ✓

ACTION: If the %D for any analyte exceeded the ± 15% criterion and the instrument was not recalibrated for those analytes, qualify positive results for all associated samples (those which followed the out-of-control standard) "J" and sample quantitation limits "UJ". (see Table 9)

9.12 Have retention time (RT) windows been properly calculated for each analyte of interest (Method 8000B, section 7.6), using RTs from the associated calibration verification/continuing standard? per lab SOP [✓] __ __

ACTION: If no, take action specified in section 3.2 above

9.13 Do all standard retention times for each calibration verification/continuing calibration standard fall within the windows established during the initial calibration sequence? [ ] __ ✓

9.14 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows. per updated window A [✓] __ __

ACTION: For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use paragraph B below. If the answer to either 9.13 or 9.14 above is no, check the chromatograms of all samples which followed the last in-control standard. If samples were not re-analyzed, all samples analyzed after the last in-control standard must be evaluated using professional judgement.

(A) For non-detected target compounds, check to see if the sample chromatograms contain any peaks that are close to the expected RT window of the Arcolor of interest. If no peaks are present, no qualification of data is necessary. If peaks are present close th RT window of the Aroclor of interest, qualify the non-detected values as presumptively present "N".

Yes NO N/A

(B) For detected compounds in the affected samples, if peaks within the RT window, no qualification necessary. If peaks are close to the expected RT window of the Aroclor of interest, the reviewer can examine the data package for the presence of three or more standards the Aroclor of interest that were run within the analytical sequence during which the sample was analyzed. If three or more such standards are present, the RT window can be reevaluated using the Mean Retention Times of the standards. If the peaks in the affectd sample fall within the revised window, qualify the detected target compounds "NJ". If the reviewer cannot do anything with the data to resolve the problem of concern, qualify all non-detects as unusable "R". (Table 9)

9.15 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence sequence (closing CCV). (Table 9) [Y] ___ ___

Table 9. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	**Non-Detected Associated Compounds**
RT out of RT window	Use professional judgement (Sec 9.14)	
%D not within +/- 15%	J	UJ
Time elapsed greater than section 9.15 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.16 Are there any transcription/calculation errors between raw data and data summary forms? ___ [N] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [Y] ___ ___

Yes NO N/A

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

10.3 Were the TCMX/DCB surrogate RTs for the samples within the mean surrogate RT from the initial calibration? [✓] ___ ___

Action: If no, see "Action" in section 9.14 above

11.0 Extraction Techniques for Sample Preparation

Method 8082A permits a variety of extraction techniques to be used for sample preparation. Check which extraction procedure was used?

1. Aqueous samples:

    1. Separatory funnel (Method 3510) [✓] ___ ___
    2. Continuous liquid-liquid extraction (Method 3520) [ ] ___ ___
    3. Solid phase extraction (Method 3535) [ ] ___ ___
    4. Other [ ] ___ ___

2. Solid samples:

    1. Soxhlet (Method 3540) [ ] ___ ___
    2. Automated Soxhlet (Method 3541) [ ] ___ ___
    3. Pressurized fluid (Method 3545) [ ] ___ ___
    4. Microwave extraction (Method 3546) [ ] ___ ___
    5. Ultrasonic extraction (Method 3550) [✓] ___ ___

Yes NO N/A

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently.
Were there any false negatives? ___ [✓] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation provided when sample concentration was sufficient (> 10 ug/ml) in the final extract? [ ] ___ [✓]

ACTION: Indicate with red pencil which Form I results were confirmed by GC/MS and also note in data assessment. GC/MS confirmation is an option, see section 7.10 of Method 8082A-20. If GC/MS confirmation is not available, follow action in section 3.2.

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~≤25.0%?~~ <40% (per method) [✓] ___ ___

NOTE: The method requires quantitation from one column. The second column is to confirm the presence of an analyte. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier

Yes NO N/A

0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected)	"NJ"
>50% (PCBs value is <CRQL)	"U"
>200%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that he higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ ☑ ___

NOTE: Single-peak PCBs results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? ☑ ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

Yes NO N/A

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? ☑ ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ ☑ ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for PCB analysis? ☑ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made

Yes NO N/A

to determine the proper identification of field duplicates.

SD023 / SB023P NO + results

	YES	NO	N/A
A.I.1 **Contract Compliance Screening Report** Present? (not CLP)	[ ]	___	✓
ACTION: If no, contact RSCC/PO.			
A.I.2 **Record of Communication (from RSCC)** Present?	[ ]	___	✓
ACTION: If no, request from the RSCC.			
A.1.3 **Sampling Trip Report** Present and complete?	[ ]	___	✓
ACTION: If no, contact RSCC/PO.			
A.I.4 **Chain of Custody/Sample Traffic Report** Present?	[✓]	___	___
Legible?	[✓]	___	___
Signature of sample custodian present?	[✓]	___	___
ACTION: If no, contact RSCC/WAM/PO.			
A.I.5 **Cover Page** Present?	[✓]	___	___
Is the Cover Page properly filled in and the verbatim signed by the lab manager or the manager's designee?	[✓]	___	___
Do the sample identification numbers on the Cover Page agree with sample Identification numbers on:			
(a) Traffic Report Sheet?	[ ]	___	✓

274

	YES	NO	N/A
(b) Form I's?	☑		
Is the number of samples on the Cover Page the same as the number of samples on the Traffic Report sheet and the Regional Record of Communication (ROC) for the data Case?		☑	not CLP

ACTION:
If no for any of the above, prepare Telephone Record Log and contact RSCC/PO for re-submittal of the corrected Cover Page from the laboratory.

A.1.6 **SDG Narrative, DC-1 & DC-2 Form**

Is the SDG Narrative present?	☑		
Is Sample Log-In Sheet(Form DC-1) present and complete?		☑	not CLP
Is Complete SDG Inventory Sheet(Form DC-2) present and complete?		☑	

ACTION:
If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.

A.1.7 **Form I to XV**

A.1.7.1 Are all the Form I through Form XV labeled with:

Laboratory Name?	☑		
Laboratory Code?		☑	
RAS/Non-RAS Case No.?		☑	
SDG No.?	☑		

275

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Soil samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3050B.
Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Aluminum at 21.3 UG/L, Barium at 0.347 UG/L, Beryllium at 0.328 UG/L, Cadmium at 0.556 ug/L, Cobalt at 0.521 ug/L, Iron at 31.2 UG/L, Magnesium at 19.2 UG/L, Manganese at -0.401 UG/L, Potassium at 98.8 UG/L, Thallium at 4.68 UG/L.
CCB961320 was analyzed on 03/15/11 12:18. The following analyte(s) were detected below RL: Calcium at 99.6 UG/L, Manganese at -0.699 UG/L.
CCB961446 was analyzed on 03/15/11 13:34. The following analyte(s) were detected below RL: Aluminum at 15.3 UG/L, Iron at 18 UG/L, Manganese at -0.68 UG/L, Nickel at -1.45 UG/L.

276

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

CCB961465 was analyzed on 03/15/11 15:46. The following analyte(s) were detected below RL: Manganese at -0.769 UG/L, Nickel at -2.12 UG/L, Vanadium at 0.526 UG/L.

ICB962007 was analyzed on 03/17/11 06:55. The following analyte(s) were detected below RL: Beryllium at 0.168 UG/L, Iron at 9.5 UG/L, Manganese at -0.939 UG/L.
CCB962018 was analyzed on 03/17/11 11:20. The following analyte(s) were detected below RL: Manganese at -1.07 UG/L, Nickel at -0.987 UG/L, Thallium at 4.46 UG/L.
CCB962030 was analyzed on 03/17/11 12:31. The following analyte(s) were detected below RL: Manganese at -1.1 UG/L, Nickel at -1.32 UG/L, Selenium at -6.62 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met with the exception of:
Post Digestion Spike 350203707A was analyzed with the soil samples on 03/15/11. The following analyte(s) were recovered below criteria: Iron at 76 % with criteria of (80-120). The most probable cause for the PDS exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.

3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

MS - VWW06-SD018-0211MS was analyzed with the soil samples on 03/15/11. The following analyte(s) were recovered below criteria: Antimony at 38.2 % with criteria of (80-120), Iron at 65.7 % with criteria of (80-120), Manganese at 72.8 % with criteria of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 128.4 % with criteria of (80-120).

SD - VWW06-SD018-0211SD was analyzed with the soil samples on 03/15/11. The following analyte(s) were recovered below criteria: Antimony at 39.2 % with criteria of (80-120), Iron at 71.6 % with criteria of (80-120), Manganese at 66.7 % with criteria of (80-120), Sodium at 69.6 % with criteria

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

of (80-120) and the following analyte(s) were recovered above criteria: Aluminum at 148 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met with the exception of:
Serial Dilution 350202102L was analyzed with the water samples on 03/17/11. The following analyte(s) exceeded criteria: Manganese at 16 % with criteria of (10). The most probable cause for the SD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.
Samples coded accordingly.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/17/2011

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. **Sample Preparation:** All holding times were met.

B. **Sample Analysis:** All holding times were met.

III. METHODS

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7470A.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7470A.

V. ANALYSIS

A. **Calibration:**

All acceptance criteria were met.

B. **Blanks:**

1. **Calibration Blanks:**

All acceptance criteria were met.

2. **Method Blanks:**

All acceptance criteria were met.

C. **Spikes:**

1. **Laboratory Control Spikes (LCS):**

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. **Post Digestion Spike:**

All acceptance criteria were met.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

No spikes requested by client.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____

Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Samples were analyzed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 7471A.

IV. PREPARATION

Soil samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 7471A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met.

3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):

CASE NARRATIVE
MERCURY

PEL Lab Reference No./SDG: 3502037

Client: CH2M Hill

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 03/16/2011

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : PEL Laboratories Inc.

Project: Vieques

Laboratory Workorder / SDG #: K0225

SW846 6020A

I. SAMPLE RECEIPT

No exceptions or unusual conditions were encountered unless a Sample Condition Notification Form, or other record of communication is included with the Sample Receipt Documentation.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

III. METHODS

Samples were analyzed following procedures in laboratory test code: SW846 6020A

IV. PREPARATION

Aqueous Samples were prepared following procedures in laboratory test code: ICP_MS_W_PR(3005A)
Soil Samples were prepared following procedures in laboratory test code: ICP_MS_S_PR(3050B)

V. INSTRUMENTATION

The following instrumentation was used to perform
Instrument Code: X1
Instrument Type: ICPMS
Description: X1
Manufacturer: ThermoFisher
Model: X-Series 2

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

All method blanks were within the acceptance criteria.

C. Spikes:

1. Laboratory Control Spikes (LCS):

Percent recoveries for lab control samples were within the QC limits.

2. Matrix spike (MS):

Matrix spike was performed on sample: VWW06-SD018-0211 (K0225-07AMS).
Percent recoveries were within the QC limits.

D. Post Digestion/Distillation Spike (PDS):

No client-requested PDS analyses were included in this SDG.

E. Duplicate sample:

Duplicate analysis was performed on sample: VWW06-SD018-0211 (K0225-07ADUP).
Relative percent differences were witin the QC limits.

F. Serial Dilution (SD):

Serial Dilution analysis was performed on sample: VWW06-SD018-0211 (K0225-07ASD).

Percent differences were within the QC limits with the exception of Chromium.

G. Samples:

All soil samples and associated QC samples were diluted five fold prior to analysis. This is expressed as a 500mL final volume for reporting purposes.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed: _____

Date: 3/3/11

	YES	NO	N/A
Contract No.?	☑		

ACTION:
If no for any of the above, note under Contract Problem/Non-Compliance Section of the "Data Review Narrative" and contact PO for corrected Form(s) from the laboratory.

A.1.7.2 After comparing values on Forms I-IX against the raw data, do any computation/ transcription errors exceed 10% of the reported values on the Forms for:

(a) all analytes analyzed by ICP-AES?		☑	
(b) all analytes analyzed by ICP-MS?		☑	
(c) Mercury?		☑	
(d) Cyanide?			☑

ACTION:
If yes, prepare Telephone Record Log and contact CLP PO/TOPO for the corrected data from the laboratory.

A.1.8 Raw Data

Data shall not be validated without the hard/electronic copies of the associated raw data for samples and QC samples.

A.1.8.1 Digestion/Distillation Log

Digestion Log for ICP-AES (Form XII)present?	☑		
Digestion Log for ICP-MS (Form XII) present?	☑		
Digestion Log for mercury (Form XII) present?	☑		
Distillation Log for cyanide (Form XII) present?			☑

Are pH values for metals and

286

	YES	NO	N/A	
cyanide reported for each aqueous sample?	☑	_	_	
Are percent solids calculations present for soils/sediments?	☑	_	_	not validated
Are preparation dates present on the sample preparation logs/bench sheets?	☑	_	_	

NOTE:
Digestion/Distillation log must include weights, volumes, and dilutions used to obtain the reported results.

A.1.8.2 Is the analytical instrument real-time printouts present for:

ICP-AES?	☑	_	_
ICP-MS?	☑	_	_
Mercury?	☑	_	_
Cyanide?	☐	_	☑

Are all laboratory bench sheets and instrument raw data printouts necessary to support all sample analyses and QC operations:

Legible?	☑	_	_
Properly labeled?	☑	_	_

Are all field samples, QC samples and field QC samples present on:

Digestion/Distillation log?	☑	_	_
Instrument Printouts?	☑	_	_

ACTION:
If no for any of the above questions in Section A.1.8.1 and Section A.1.8.2, write Telephone Record Log and contact TOPO/PO for re-submittal from the laboratory.

287

		YES	NO	N/A
A.1.9	**Technical Holding Times**: (Aqueous and soil samples) (Examine sample Traffic Reports and digestion/distillation logs to determine the holding time from the sample collection date to the sample preparation date.)			
A.1.9.1	Cyanide distillation(14 days)exceeded?	_	☐	✓
	Mercury analysis(28 days) exceeded?	_	✓	_
	Other Metals analysis(180 days)exceeded?	_	☑	_

ACTION:
If yes, reject (R) and red-line non-detects and flag as estimated (J)results ≥ MDL even if sample(s) was preserved properly.

NOTE:
In addition to qualifying the data, a list of all samples and analytes which exceeded the holding times must be prepared. Report for each sample the number of days that were exceeded. (Subtract the sample collection date from the sample preparation date). Attach this list to the data review narrative.

A.1.9.2	Is pH of aqueous samples for:			
	Metals Analysis ≤ 2?	✓	_	_
	Cyanide Analysis ≥ 12?	☐	_	✓

ACTION:
If no for any of the above, flag non-detects as "R" and detects as "J".

A.1.9.3	Is the cooler temperature ≤ 10 C°?	☑	_	_

ACTION:
If cooler temperature is >10°C , flag non-detects as "UJ" and detects as "J".

within +/- 2°C of 4°C - no quals

A.1.10 **Final Data Correctness - Form I**

A.1.10.1 Are Form I's for all samples

288

	YES	NO	N/A
present and complete?	[✓]	___	___

ACTION:
If no, prepare Telephone Record Log and contact CLP PO/TOPO for submittal from the laboratory.

A.1.10.2 Verify there are no calculation and transcription errors in the results reported on Form I's. Circle on each Form I all results that are incorrect.

Is the calculation error less than 10% of the correct result?	[✓]	_	_
Are results on Form I's reported in correct units (ug/L for aqueous and ~~MG/KG~~ for soils)? ug/kg for this project	[✓]	___	___
Are results on Form I'S reported by correct significant figures?	[✓]	___	___
Are soil sample results on Form I's corrected for percent solids?	[✓]	___	___
Are all "less than MDL" values reported by the ~~CRQLs~~ LOD per project SAP and coded with "U"?	[✓]	___	___
Are values less than the ~~CRQLs~~ LOQ per project SAP but greater than or equal to the MDLs flagged with "J"?	[✓]	___	___
Are appropriate contractual quality control and Method qualifiers used?	[✓]	___	___

ACTION:
If no for any of the above questions, prepare Telephone Record Log, and contact CLP PO/TOPO for corrected data.

A.1.10.3 Do EPA sample identification numbers and the corresponding laboratory sample identification numbers match on the Cover Page, Form I's and in the raw data? [✓] ___ ___

Was a brief physical description

ICP - AES	
SAMPLE ID	VWW06-SD023-0211
ANALYTE	aluminum
Lab Value CONCENTRATION (ug/Kg)	16900000
AMOUNT FROM RAW DATA (ug/L)	83300
SAMPLE SIZE (g)	0.88
FINAL VOLUME (L)	0.05
DILUTION FACTOR	10
DRYNESS FACTOR	0.28
CONVERSION FACTOR (g TO Kg)	1000
CALCULATED CONCENTRATION (ug/Kg)	169034091

FIMS	
SAMPLE ID	VWW06-SD018-0211
ANALYTE	mercury
Lab Value CONCENTRATION (ug/Kg)	98.5
AMOUNT FROM RAW DATA (ug/L)	0.408
SAMPLE SIZE (g)	0.408
FINAL VOLUME (L)	0.025
DILUTION FACTOR	1
DRYNESS FACTOR	0.254
CONVERSION FACTOR (g TO Kg)	1000
CALCULATED CONCENTRATION (ug/Kg)	98.4

ICP-MS	
SAMPLE ID	VWW06-SD023P-0211
ANALYTE	chromium
Lab Value CONCENTRATION (mg/Kg)	15.1
AMOUNT FROM RAW DATA (ug/L)	11.18
SAMPLE SIZE (g)	1.28
FINAL VOLUME (L)	0.1
DILUTION FACTOR	5
DRYNESS FACTOR	0.29
CONVERSION FACTOR (ug/g to mg/Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	15.1

	YES	NO	N/A
of the samples before and after digestion given on the Form I's?	[ ]	✓	
Was any sample result outside the mercury/cyanide calibration range or the ICP-AES/ICP-MS linear range diluted ~~and noted on the Form I?~~ some DL may have been performed - noted on Form 14 and raw data	[✓]		

ACTION:
If no for any of the above, note under the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.11 **Initial Calibration**

A.1.11.1	Is a record of at least 2 point (A blank and a standard)calibration present for ICP-AES analysis?	[✓]		
	Is a record of at least 2 point (a blank and a standard)calibration present for ICP-MS analysis?	[✓]		
	Is a record of at least 5 point calibration (a blank & 4 standards)present for Hg analysis?	[✓]		
	Is a record of at least 4 point calibration (a blank & 4 standards)present for cyanide?	[ ]		✓

ACTION:
If incomplete or no initial calibration was performed, reject (R) and red-line the associated data (detects & non-detects).

	Is one initial calibration standard at the CRQL level for cyanide and mercury?	[✓]		

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the Data Review Narrative.

A.1.11.2	Is the curve correlation coefficient $\geq$ 0.995 for:			

291

		YES	NO	N/A
	Mercury Analysis?	[✓]	___	___
	Cyanide Analysis?	[___]	___	✓
	ICP-AES (more than 2 point Calib.)?	[___]	___	✓
	ICP-MS (more than 2 point calib.)?	[✓]	___	___

ACTION:
If no, qualify the associated sample results ≥ MDL as estimated "J" and non-detects as "UJ".

NOTE:
The correlation coefficient shall be calculated by the data validator using standard concentrations and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.12 Initial and Continuing Calibration Verification- Form IIA

A.1.12.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for ICP-AES and ICP-MS when both these methods were used for the same analyte?	[___]	___	✓

ACTION:
If no for any of the above, prepare a Telephone Record Log and contact PO/TOPO for re-submittal from the laboratory.

A.1.12.2	Was a Continuing Calibration Verification performed every 10 samples or every 2 hours whichever is more frequent?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.12.3	Was an ICV or a mid-range standard distilled and analyzed with each batch of cyanide samples?	[___]	___	✓

	YES	NO	N/A

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative and qualify results ≥ MDL as estimated (J).

A.1.12.2 Circle on each Form IIA all percent recoveries that are outside the contract windows.

Are ICV/CCVs within control limits for:

Metals - 90-110%R?	[✓]	___	___
Hg - 80-120%R?	[✓]	___	___
Cyanide - 85-115%R?	[___]	___	✓

ACTION:
If no, qualify all samples between a previous technically acceptable CCV standard and a subsequent technically acceptable CCV standard as follows as follows:

Qualify as estimated (J) all detects and non-detects, if the ICV/CCV %R is between 75-89%(65-79% for Hg; 70-84% for CN). Qualify only positive results(≥ MDL) as "J" if the ICV/CCV %R is between 111-125%(121-135% for Hg;116-130% for CN). Reject (R) and red-line only
detects if the recovery is greater than 125% (135% for Hg; 130% for CN). Reject (R) and red-line all associated results (hits and non-detects)if the recovery is less than 75%(65% for Hg;70% for CN).

NOTE:
For ICV that does not fall within the acceptance limits, qualify all samples reported from the analytical run.

A.1.12.3 Was the distilled ICV or mid-range standard for cyanide within acceptance limits (85-115%)? [___] ___ ✓

ACTION:
If no, Qualify all cyanide results ≥ MDL as "J".

A.1.13 **CRQL Standard Analysis - Form IIB**

A.1.13.1 For each ICP-AES run, was a CRI

	YES	NO	N/A
(CRQL or MDL when MDL > CRQL) standard analyzed? (Note:CRI is not required for Al, Ba, Ca, Fe, Mg, Na and K.)	[✓]	___	___
For each ICP-MS run, was a CRI (CRQL or MDL when MDL > CRQL) standard analyzed for each mass/isotope used for the analysis? Resub tabulating recoveries requested & received.	[✓]	___	___ ___
For each mercury run, was a CRQL standard analyzed? * lab runs a digested ICAL std at the RL - met +/-30% criteria	[___]	* ___ ✓	___
For each cyanide run, was a CRQL standard analyzed?	[___]	___	✓

Sample required by SW-846 at beginning of runs only

ACTION:
If no for any of the above, write this deficiency in the Contract Problems/ Non-Compliance Section of the Data Review Narrative, inform CLP PO and flag results in the affected ranges (detects <2xCRQL)as J and non-detects UJ.

The affected ranges are:
ICP-AES Analysis - *True Value ± CRQL
ICP-MS Analysis - *True Value ± CRQL
Mercury Analysis - *True Value ± CRQL
Cyanide Analysis - *True Value ± CRQL
* True value of the CRQL Standard

A.1.13.2	Was a CRQL standard analyzed after the ICV/ICB, before the final CCV/CCB and once every 20 analytical samples in the analytical run for each analysis?	[___]	___	✓

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the "Data Review Narrative".

A.1.13.3 Circle on each Form IIB all percent recoveries that are outside the acceptance windows.

Jacqueline Cleveland

From: Edward Lawler [Mitkem] [elawler@mitkem.com]
Sent: Wednesday, April 13, 2011 1:28 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020
Attachments: PEL_VIEQUES-LLICV.metals.xls

Jackie—

Attached is an Excel file containing all the Low Level ICVs (LLICVs) for the Vieques SDGs for Method 6020.

This is right out of our database. There is a separate section of the spreadsheet for each ICP/MS run, also identifying which Mitkem SDGs were analyzed in that run.

These data probably include extra elements, which were included for other samples analyzed in the same run.

Please let me know if you have any questions, or need any additional information.

--Ed

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 6:27 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Thanks Ed,

I will wait for the summary pages!

Jackie

From: Edward Lawler [Mitkem] [mailto:elawler@mitkem.com]
Sent: Tuesday, April 12, 2011 4:03 PM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 6020

Hi Jackie—

That check standard is included in all of the SDGs. We call it the Low Level ICV (or LLICV). Our CLP-type inorganics data reporting software doesn't have a form to report these on, so they are included in the raw data for each SDG, but not on the reporting forms.

For example, in Mitkem SDG K0204, the LLICV is listed as the 10th run on page 0064, and the raw data for this run are on page 0092—but this data is somewhat difficult to follow…..

We are working on something to get you the summaries of %recoveries, which I will hopefully have to you tomorrow.

--Ed

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:25 PM
To: Edward Lawler [Mitkem]
Cc: 'DataQual Environmental Services, LLC'; John Heyman [PEL]; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU 6 Metals by 6020

Good Afternoon Ed,

I am doing data validation for CH2M HILL for the Vieques SWMU 6 data for which you were subcontracted to perform the 6020 metals analyses. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects Work Order #s K0204, K0225, K0205, K0201 & K0215. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

K0204 X1_110223A

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Arsenic	2.30064728	2	2.30064728	2.3	2	0.19	0.5	2	115.03%		70	130
A	Y	Chromium	2.01545733	2	2.01545733	2	2	0.16	0.5	2	100.77%		70	130
A	Y	Selenium	5.66130075	5	5.66130075	5.7	5	0.15	0.5	5	113.23%		70	130

K0201 X1_110216B

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Aluminum	21.0027562	20	21.0027562	21	20	2.9	5	20	105.01%		70	130
A	Y	Antimony	2.12426401	2	2.12426401	2.1	2	0.2	0.2	2	106.21%		70	130
A	Y	Arsenic	2.00593914	2	2.00593914	2	2	0.19	0.5	2	100.30%		70	130
A	Y	Barium	10.0122643	10	10.0122643	10	10	1.3	3	10	100.12%		70	130
A	Y	Beryllium	1.00140666	1	1.00140666	1	1	0.072	0.2	1	100.14%		70	130
A	Y	Cadmium	1.00829914	1	1.00829914	1	1	0.084	0.2	1	100.83%		70	130
A	Y	Calcium	472.76306	500	472.76306	470	500	24	38	500	94.55%	J	70	130
A	Y	Chromium	2.03706028	2	2.03706028	2	2	0.16	0.5	2	101.85%		70	130
A	Y	Cobalt	1.06535199	1	1.06535199	1.1	1	0.024	0.1	1	106.54%		70	130
A	Y	Copper	2.15205123	2	2.15205123	2.2	2	0.23	0.6	5	107.60%	J	70	130
A	Y	Iron	192.148667	200	192.148667	190	200	14	40	200	96.07%	J	70	130
A	Y	Lead	0.97907404	1	0.97907404	0.98	1	0.068	0.2	1	97.91%	J	70	130
A	Y	Magnesium	527.600786	500	527.600786	530	500	7.8	12	500	105.52%		70	130
A	Y	Manganese	5.4470818	5	5.4470818	5.4	5	0.83	1	5	108.94%		70	130
A	Y	Nickel	1.0502218	1	1.0502218	1.1	1	0.17	0.25	1	105.02%		70	130
A	Y	Potassium	484.529478	500	484.529478	480	500	14	40	500	96.91%	J	70	130
A	Y	Selenium	5.36275801	5	5.36275801	5.4	5	0.15	0.5	5	107.26%		70	130
A	Y	Silver	1.01190753	1	1.01190753	1	1	0.022	0.05	1	101.19%		70	130
A	Y	Sodium	487.672118	500	487.672118	490	500	33	50	500	97.53%	J	70	130
A	Y	Thallium	0.9840832	1	0.9840832	0.98	1	0.048	0.1	1	98.41%	J	70	130
A	Y	Vanadium	5.4149342	5	5.4149342	5.4	5	0.61	1	5	108.30%		70	130
A	Y	Zinc	5.54426374	5	5.54426374	5.5	5	0.73	1	5	110.89%		70	130

K0201, K0205 X1_110217B

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	2.07949727	2	2.07949727	2.1	2	0.2	0.2	2	103.97%		70	130
A	Y	Arsenic	2.00792532	2	2.00792532	2	2	0.19	0.5	2	100.40%		70	130
A	Y	Cadmium	0.9580971	1	0.9580971	0.96	1	0.084	0.2	1	95.81%	J	70	130
A	Y	Chromium	1.84630224	2	1.84630224	1.8	2	0.16	0.5	2	92.32%	J	70	130
A	Y	Cobalt	0.98179571	1	0.98179571	0.98	1	0.024	0.1	1	98.18%	J	70	130
A	Y	Copper	1.81974453	2	1.81974453	1.8	2	0.23	0.6	5	90.99%	J	70	130
A	Y	Lead	0.95434051	1	0.95434051	0.95	1	0.068	0.2	1	95.43%	J	70	130
A	Y	Silver	0.97534637	1	0.97534637	0.98	1	0.022	0.05	1	97.53%	J	70	130

K0215,
K0225 **X1_110222A**

AT	&T	Analyte	Ra&w Val	RawSpk	Calc Val	Final V&al	Spike	&MDL	LOD	PQL	%Rec	Qual	LowLimit	HighLimit
A	Y	Antimony	1.8964567	2	1.8964567	1.9	2	0.2	0.2	2	94.82%	J	70	130
A	Y	Arsenic	2.13301722	2	2.13301722	2.1	2	0.19	0.5	2	106.65%		70	130
A	Y	Barium	10.7561986	10	10.7561986	11	10	1.3	3	10	107.56%		70	130
A	Y	Beryllium	1.03423982	1	1.03423982	1	1	0.072	0.2	1	103.42%		70	130
A	Y	Cadmium	1.04382134	1	1.04382134	1	1	0.084	0.2	1	104.38%		70	130
A	Y	Chromium	1.87146555	2	1.87146555	1.9	2	0.16	0.5	2	93.57%	J	70	130
A	Y	Cobalt	1.06305979	1	1.06305979	1.1	1	0.024	0.1	1	106.31%		70	130
A	Y	Copper	2.20898143	2	2.20898143	2.2	2	0.23	0.6	5	110.45%	J	70	130
A	Y	Iron	195.167776	200	195.167776	200	200	14	40	200	97.58%	J	70	130
A	Y	Lead	1.0698727	1	1.0698727	1.1	1	0.068	0.2	1	106.99%		70	130
A	Y	Nickel	1.01332509	1	1.01332509	1	1	0.17	0.25	1	101.33%		70	130
A	Y	Selenium	5.56241436	5	5.56241436	5.6	5	0.15	0.5	5	111.25%		70	130
A	Y	Silver	1.00087559	1	1.00087559	1	1	0.022	0.05	1	100.09%		70	130
A	Y	Thallium	1.07403596	1	1.07403596	1.1	1	0.048	0.1	1	107.40%		70	130
A	Y	Vanadium	5.44821072	5	5.44821072	5.4	5	0.61	1	5	108.96%		70	130
A	Y	Zinc	5.63784043	5	5.63784043	5.6	5	0.73	1	5	112.76%		70	130

Jacqueline Cleveland

From: John Heyman [PEL] [jheyman@pelab.com]
Sent: Wednesday, April 13, 2011 11:08 AM
To: Jacqueline Cleveland
Cc: DataQual Environmental Services, LLC; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: RE: CH2M HILL Vieques SWMU6

Jackie:

Good afternoon.

Per our QAO:
The mercury procedures were reviewed. The calibration curve is digested with every batch analyzed. The low cal standard is at 0.2ug/L which is the Reporting Limit.
PEL does not check an LLQC sample regularly at this time but as the low cal standard is at the RL and carried through the entire process any raw data from a cal curve could be used to verify an LLQC.
Using the Raw Data from the regular Hg analysis for SDG 3501977 the recovery for the low cal standard, 0.2ug/L, yielded a 78.3% recovery, meeting the +/-30% criteria.

For example on SDG 3501977, CS1 data can be found in the metals raw data section on page 4531.

Please let me know if you have any questions or concerns.

Thanks!
John

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 12, 2011 2:35 PM
To: John Heyman [PEL]
Cc: 'DataQual Environmental Services, LLC'; Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: CH2M HILL Vieques SWMU6

Good Afternoon John,

I have a request regarding the mercury analysis. There is no lower limit of quantitation check (LLQC) standard included in the quality control results for the data packages. This standard is required by the method. This affects all 5 SDGs. Please let me know if these standards were analyzed and if so, please provide the QC results for them for all five SDGs. If the standards are there and I am just missing them let me know! Don't hesitate to contact me if you have any questions. Thank you!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

	YES	NO	N/A
Is the CRQL standard within control limits for:			
Metals(ICP-AES/ICP-MS)- 70 - 130%?	[✓]	—	—
Mercury- 70 - 130%? see note at * on previous page	[✓]	—	—
Cyanide - 70 - 130%?	[ ]	—	✓

ACTION:
If no, flag detects <2xCRQL as "J" and non-detects as "UJ" if the CRQL standard recovery is between 50-69%. Flag(J) only detects <2xCRQL if the recovery is between 131% and ≤180%. If the recovery is less than 150%, reject(R) and red-line non-detects and detects < 2xCRQL, and flag (J) detects between 2xCRQL and ICV/CCV. Reject and red-line only detects <2xCRQL and flag (J)detects ≥ 2xCRQL but < ICV/CCV if the recovery is > 180%.

NOTE:
1. Qualify all field samples analyzed between a previous technically acceptable analysis of the CRQL standard and a subsequent acceptable analysis of the CRQL standard
2. Flag (J) or reject (R) only the final sample results on Form I's when Sample raw data are within the affected ranges and the CRQL standard is outside the acceptance windows.
3. The samples and the CRQL standard must be analyzed in the same analytical run.

A.1.14 Initial and Continuing Calibration Blanks - Form III

A.1.14.1 Present and complete for all the instruments used for the metals and cyanide analyses?	[✓]	—	—
Was an initial Calibration Blank analyzed after ICV?	[✓]	—	—
Was a continuing Calibration Blank analyzed after every CCV and every 10 samples or every 2 hours, whichever is more frequent?	[✓]	—	—

Were the ICB & CCB values ≥ MDL but < CRQL reported on Form III and flagged "J" by

300

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Preparation Blank Matrix (water/soil): SOIL

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/KG

Analyte	Initial Calib Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	21.3	J	22.3	J	100	U	100	U	3800	U	P
Antimony	10	U	10	U	10	U	10	U	480	U	P
Barium	0.347	J	10	U	10	U	10	U	320	U	P
Beryllium	0.328	J	3.65	U	0.127	J	3.65	U	320	U	P
Cadmium	0.556	J	5	U	5	U	0.555	J	100	U	P
Calcium	100	U	100	U	100	U	100	U	6600	U	P
Cobalt	0.521	J	5	U	5	U	5	U	100	U	P
Copper	5	U	5	U	5	U	5	U	320	U	P
Iron	31.2	J	21.9	J	40	U	40	U	1200	U	P
Lead	8	U	8	U	8	U	8	U	680	U	P
Magnesium	19.2	J	21.6	J	100	U	100	U	5800	U	P
Manganese	-0.401	J	-0.808	J	-0.848	J	-0.802	J	320	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	7.4	U	CV
Nickel	4.1	U	-1.33	J	-1.54	J	-1.02	J	320	U	P
Potassium	98.8	J	500	U	500	U	500	U	10000	U	P
Selenium											P
Silver	5	U	5	U	5	U	5	U	320	U	P
Sodium	300	U	300	U	300	U	300	U	20000	U	P
Thallium	4.68	J	10	U	6.22	J	10	U	680	U	P
Vanadium	9	U	9	U	9	U	9	U	320	U	P
Zinc	20	U	20	U	20	U	20	U	660	U	P

none assoc

all assoc

all soils associated

ICB IDs: CV= ICB949652, P= ICB961289

CCB1 IDs: CV= CCB949654, P= CCB961294

CCB2 IDs: CV= CCB949666, P= CCB961296

CCB3 IDs: CV= CCB949678, P= CCB961297

Be

SD023
SD023P
SD022
SD020
SD019
SD018

all > LOD - NQ

Tl

SD023
SD023P
SD019

all > LOD - NQ

180311 1806

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C	5	C	3/15 6/12/18	C	Prepa-ration Blank	C	M
Aluminum			100	U	100	U	100	U	18.6	U	P
Antimony			10	U	10	U	10	U			P
Barium			10	U	10	U	10	U	0.44	U	P
Beryllium			3.65	U	3.65	U	3.65	U	0.24	U	P
Cadmium			5	U	5	U	5	U			P
Calcium			122	=	119	=	99.6	J NQ	78	U	P
Cobalt			5	U	5	U	5	U			P
Copper			5	U	5	U	5	U			P
Iron			40	U	40	U	40	U	11	U	P
Lead			8	U	8	U	8	U			P
Magnesium			100	U	100	U	100	U	19.6	U	P
Manganese			-0.673	J	-0.706	J	-0.699	J NQ	0.7	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.074	U	CV
Nickel			4.1	U	4.1	U	4.1	U	1.86	U	P
Potassium			500	U	500	U	500	U	143	U	P
Selenium									8.2	U	P
Silver			5	U	5	U	5	U			P
Sodium			300	U	300	U	300	U	300	U	P
Thallium			10	U	10	U	10	U	8.8	U	P
Vanadium			9	U	9	U	9	U	0.88	U	P
Zinc			20	U	20	U	20	U	8	U	P

None associated

SD018 SD023 SD023P

↑ water blk - no impact

ICB IDs: CV= ICB950355

CCB1 IDs: CV= CCB949686, P= CCB961309

CCB2 IDs: CV= CCB950357, P= CCB961310

CCB3 IDs: CV= CCB950369, P= CCB961320

180311 1806

302

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	8	C		C	Prepa-ration Blank	C	M
Aluminum			15.3	J NQ	100	U					P
Antimony			~~10~~	U	10	U					P
Barium			10	U	10	U					P
Beryllium			3.65	U	3.65	U					P
Cadmium			5	U	5	U					P
Calcium			100	U	100	U					P
Cobalt			5	U	5	U					P
Copper			5	U	5	U					P
Iron			18	J NQ	40	U					P
Lead			~~8~~	U	8	U					P
Magnesium			100	U	100	U					P
Manganese			-0.68	J	-0.769	J	NQ				P
Mercury			~~0.2~~	U	0.2	U	0.2	U			CV
Nickel			-1.45	J	-2.12	J	NQ				P
Potassium			500	U	500	U					P
Selenium											P
Silver			5	U	5	U					P
Sodium			300	U	300	U					P
Thallium			10	U	10	U					P
Vanadium			9	U	0.526	J	NQ				P
Zinc			20	U	20	U					P

SD018
SD023
SD023P

SD022
21
20
19

ICB IDs:

CCB1 IDs: CV= CCB950381, P= CCB961446

CCB2 IDs: CV= CCB950393, P= CCB961465

CCB3 IDs: CV= CCB950404

160311 1806

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	100	U	27.4	J	100	U	100	U			P
Antimony											P
Barium	10	U	10	U	10	U	10	U			P
Beryllium	0.168	J	3.65	U	3.65	U	3.65	U			P
Cadmium											P
Calcium	100	U	100	U	100	U	100	U			P
Cobalt											P
Copper											P
Iron	9.5	J	28.8	J	40	U	40	U			P
Lead											P
Magnesium	100	U	27.6	J	100	U	100	U			P
Manganese	-0.939	J	-1.05	J	10	U	-1.07	J			P
Mercury			0.2	U							CV
Nickel	4.1	U	-1.08	J	4.1	U	-0.987	J			P
Potassium	500	U	500	U	500	U	500	U			P
Selenium	9	U	-5.06	J	9	U	9	U			P
Silver											P
Sodium	300	U	300	U	300	U	300	U			P
Thallium	10	U	4.63	J	10	U	4.46	J			P
Vanadium	9	U	9	U	9	U	9	U			P
Zinc	20	U	20	U	20	U	20	U			P

EB01-021011

No Quals - rinse blank only

ICB IDs: P= ICB962007

CCB1 IDs: CV= CCB950408, P= CCB962012

CCB2 IDs: P= CCB962014

CCB3 IDs: P= CCB962018

180311 1806

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques / SWMU6 / 404422.FI.SW>S6

Lab Code : PEL Case No. SAS No: SDG No.: 3502037

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) 4	C		C		C	Prepa-ration Blank	C	M
Aluminum			100	U							P
Antimony											P
Barium			10	U							P
Beryllium			3.65	U							P
Cadmium											P
Calcium			100	U							P
Cobalt											P
Copper											P
Iron			40	U							P
Lead											P
Magnesium			100	U							P
Manganese			-1.1	J							P
Mercury											CV
Nickel			-1.32	J							P
Potassium			500	U							P
Selenium			-6.62	J							P
Silver											P
Sodium			300	U							P
Thallium			10	U							P
Vanadium			9	U							P
Zinc			20	U							P

EPB01-021011

No Quals - use blk only

ICB IDs:

CCB1 IDs: P= CCB962030

CCB2 IDs:

CCB3 IDs:

180311 1606

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Preparation Blank Matrix (soil/water): WATER Method Blank ID: MB-57513

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

X1_110222A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	0.429	B	0.200	U	0.200	U			0.200	U	MS
Arsenic	0.292	B	0.190	U	0.190	U			0.500	U	MS
Cadmium	0.084	U	0.084	U	0.084	U			0.200	U	MS
Chromium	0.160	U	-0.208	B	-0.248	B			1.000	U	MS
Cobalt	0.173	B	0.024	U	0.024	U			0.200	U	MS
Copper	0.230	U	0.230	U	0.230	U			0.500	U	MS
Lead	0.217	B	0.069	B	0.068	U			0.200	U	MS
Silver	0.044	B	0.160	B	0.022	U			0.050	U	MS

NQ

NQ - associated sample was only a rinse blk. No action required.

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Preparation Blank Matrix (soil/water): SOIL Method Blank ID: MB-57564

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

X1_110223A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Arsenic	0.291	B	0.190	U	0.190	U	0.190	U	0.500	U	MS
Chromium	0.160	U	0.160	U	0.160	U	0.160	U	0.500	U	MS
Selenium	0.172	B	-0.186	B	0.150	U	0.150	U	0.500	U	MS

SD018 - Flag U at LOD all other results were greater than LOD (client reporting NDs results to LOD)

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: _____ SAS No.: _____ SDG No.: SK0225

Preparation Blank Matrix (soil/water): _____ Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg): _____

X1_110223A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 4	C	Continuing Calibration Blank (ug/L) 5	C	Continuing Calibration Blank (ug/L) 6	C	Preparation Blank	C	M
Arsenic			0.190	U	0.190	U	0.190	U			MS
Chromium			0.160	U	0.160	U	0.160	U			MS
Selenium			0.150	U	0.150	U	0.203	B	see ICB		MS

		YES	NO	N/A
	using MDLs from direct analysis(Preparation Method "NP1")? (Check Form III against the raw data)	[✓]	___	___

ACTION:
If no, inform CLP PO/TOPO and make a note in the Contract-Problems/Non-Compliance Section of the "Data Review Narrative".

A.1.14.2 Circle with red pencil on each Form III all Calib. Blank values that are: LOD per project SAP

≥ MDL but ≤ ~~CRQL~~

> ~~CRQL~~ LOD

A.1.14.2.1 When MDL < LOD ~~CRQL~~, is any Calib. Blank value ≥ MDL but ≤ ~~CRQL~~ LOD? ✓ [___] ___

ACTION:
If yes, change sample results ≥ MDL but ≤ CRQL to the CRQL with a "U". Do not qualify non-detects.

See Form 3 for Single qual reg

A.1.14.2.2 When MDL < CRQL, is any Calib. Blank value > CRQL? ✓ [___] ___

ACTION:
If yes, reject (R) and red line the associated sample results > CRQL but <ICB/CCB Blank Result. Flag as "J" detects > ICB/CCB blank value but < 10xICB/CCB value. Change the sample results ≥ MDL but ≤ the CRQL to CRQL with a "U".

blk not assoc. with any samples

A.1.14.2.3 Is any Calibration Blank value below the negative CRQL? ___ [✓] ___

ACTION:
If yes, flag (J) as estimated all associated sample results ≥ CRQL but <10xCRQL.

NOTE:

1. For ICB that does not meet the technical QC Criteria, apply the action to all samples

	YES	NO	N/A

reported from the analytical run.
2. For CCBs that do not meet the technical QC criteria, apply the action to all samples analyzed between a previous technically acceptable analysis of CCB and a subsequent technically acceptable analysis of the CCB in the analytical run.,

A.1.15 **Preparation Blank - FORM III**

NOTE: The Preparation Blank for mercury is the same as the calibration blank.

A.1.15.1 Was one Preparation Blank prepared with and analyzed for:

Each Sample Delivery Group (SDG)?	[✓]	___	___
Each batch of the SDG samples digested/distilled?	[✓]	___	___
Each matrix type?	[✓]	___	___
All instruments used for metals and cyanide analyses?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the associated positive data <10xMDL for which the Preparation Blank was not analyzed.

NOTE:
If only one blank was analyzed for more than 20 samples, then the first 20 samples analyzed are not estimated(J),but all additional samples must be qualified (J).

A.1.15.2 Circle with red pencil on each Form III all Prep. Blank values that are:

Per project SAP

≥ MDL but ≤ ~~CRQL~~ LOQ, and

> ~~CRQL~~ LOQ LOQ

A.1.15.2.1 When MDL < ~~CRQL~~, is any preparation blank value ≥ MDL but ≤ ~~CRQL~~ LOQ? ___ [✓] ___

all clear

ACTION:
If yes, change sample result ≥ MDL

		YES	NO	N/A
	but ≤ CRQL to CRQL with a "U".			
A.1.15.2.2	When the MDL ≤ CRQL, is any Preparation Blank value greater than its CRQL?	___	[✓]	___
	If yes, is the Prep. Blank value greater than the value of the associated Field Blank collected and analyzed with the SDG samples?	___	[___]	✓
	If yes, is the lowest concentration of that analyte in the associated samples less than 10 times the Preparation Blank value?	___	[___]	✓

ACTION:
If yes, reject (R) and red-line all associated sample results greater than the CRQL but less than the Prep.Blank value. Flag as "J" detects > Prep. Blank value but <10xPrep.Blank. If the sample result ≥ MDL but ≤ ~~CRQL~~ LOD, replace it with ~~CRQL~~ LOD-U.

If the Prep. Blank value is less than the same analyte value in the Field Blank, do not qualify the sample results due to the Prep. Blank criteria.

NOTE:
Convert soil sample result to mg/Kg on wet weight basis to compare with the soil Prep. Blank result on Form III.

A.1.15.2.3	Is the Prep. Blank concentration below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) all associated sample results less than 10xCRQL. Qualify non-detects as estimated (UJ).

A.1.15.2.4	When the MDL is greater than the CRQL, is the preparation blank concentration on Form III greater than two times the MDL?	___	[___]	✓

ACTION:

		YES	NO	N/A
	If yes, reject (R) and red-line all positive sample results with sample raw data less than 10 times the Preparation Blank value.			
A.1.16	**ICP-AES/ICP-MS Interference Check Sample (ICS) - Form IV** **NOTE:** Not required for CN, Hg, Al, Ca, Fe and Mg.			
A.1.16.1	Present and complete?	[✓]	___	___
	Was ICS analyzed at the beginning and end of each analytical run, and once for every 20 analytical samples?	[✓]	___	___ at beginning only -
	Was ICS analyzed at the beginning of the ICP-MS analytical run?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all sample results.	sequences less than 12 hours long		
A.1.16.2	**ICP-AES Method**			
A.1.16.2.1	**ICSA Solution:** For ICP-AES, are the ICSA "Found" analyte values within the control limits ± of CRQL of the true/established mean value?	[✓]	___	___
	If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSA Solution on Form IV?	[___]	___	✓
	ACTION: If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run: Flag (J) as estimated only sample results ≥MDL			

	YES	NO	N/A

for which the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag non-detects as "UJ" and detects as "J".

A.1.16.2.3 **ICSAB Solution**

For ICP-AES, are all analyte results in ICSAB within the control limits of 80-120 of the true/established mean value? [✓] ___ ___

If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSAB Solution on Form IV? [___] ___ ✓

ACTION:
If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79%, qualify sample results ≥ MDL as "J" and non-detects as "UJ". Reject (R) and red-line all sample results (detects & non-detects) for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only positive results.

A.1.16.3 **ICP-MS Method**

A.1.16.3.1 **ICSA Solution:**

For ICP-MS, are the ICSA "Found" analyte values within the control limits of ±CRQL of the true/established mean value? [✓] ___ ___

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated only sample results ≥ MDL if the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag the associated sample detects as "J" and non-detects as "UJ".

		YES	NO	N/A
A.1.16.3.3	**ICSAB Solution** For ICP-MS, are all analyte results in ICSAB within the control limits of 80-120% of the true/established mean value, whichever is greater?	[✓]	___	___

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79% flag (J) as estimated the associated sample results ≥ MDL. Reject (R) and red-line those all sample detects and non-detects for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only detects (≥ MDL).

A.1.17 Spiked Sample Recovery: Pre-Digestion/Pre-Distillation)-Form V A
Note: Not required for Ca, Mg, K, and Na (both matrices); Al and Fe (soil only)

A.1.17.1	Was Matrix Spike analysis performed:			
	For each matrix type?	[✓]	___	___
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[✓]	___	___
	For each concentration range (i.e., low, med., high)?	[✓]	___	___
	For each analytical Method (ICP-AES, ICP-MS, Hg, CN) used?	[✓]	___	___
	Was a spiked sample prepared and analyzed with the SDG samples?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the positive data for which a spiked sample was not analyzed.

SD018-0211

NOTE:
If more than one spiked sample were analyzed for one SDG, then qualify the associated data based on the worst spiked sample analysis.

		YES	NO	N/A
A.1.17.2	Was a field blank or PE sample used for the spiked sample analysis?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated positive data of the associated SDG samples for which field blank or PE sample was used for the spiked sample analysis.

A.1.17.3 Circle on each Form VA all spike recoveries that are outside the control limits (~~75-125%~~) that have sample concentrations less than four times the added spike concentrations.

used lab QC limits

Are all recoveries within the control limits when sample concentrations are less than or equal to four times the spike concentrations?	[___]	✓	___

NOTE:
Disregard the out of control spike recoveries for analytes whose concentrations are greater than or equal to four times the spike added.

see Form 5s for flags

Are results outside the control limits (~~75-125%~~) flagged with Lab Qualifier "N" on Form I's and Form VA?	[✓]	___	___

used lab QC limits

ACTION:
If no for any of the above, write in the Contract - Problems/Non-Compliance Section of the Data Review Narrative.

A.1.17.4 Aqueous

Are any spike recoveries:

(a) less than 30%?	___	[___]	✓
(b) between 30-74%?	___	[___]	✓
(c) between 126-150%?	___	[___]	✓
(d) greater than 150%?	___	[___]	✓

ACTION:
If the matrix spike recovery is less than 30%, reject (R) and red-line all associated aqueous data (detects & non-detects). If between 30-74%, qualify all associated aqueous data ≥ MDL as "J" and non-detects

		YES	NO	N/A
	as "UJ". If between 126-150%, flag (J) all data ≥ MDL as "J". If greater than 150%, reject (R) and red-line all associated data ≥ MDL. (NOTE:Replace "N" with "J", "R" as appropriate.)			
A.1.17.5	**Soil/Sediment**			
	Are any spike recoveries:			
	(a) less than 10%?	—	[✓]	—
	(b) between 10-74%?	✓	[—]	—
	(c) between 126-200%?	✓	[—]	—
	(d) greater than 200%?	—	[✓]	—
	ACTION: If yes for any of the above, proceed as follows:			
	If the matrix spike recovery is less than 10%, reject (R) and red-line all associated data (detects & non-detects); if between 10-74%, qualify all associated data ≥ MDL as "J" and non-detects as "UJ"; if between 126-200%, flag (J) all associated data ≥ MDL as "J" If greater than 200%, reject (R) and red-line all associated data ≥ MDL. (NOTE:Replace "N" with "J" or "R" as appropriate.)	Flagged accordingly		
A.1.18	**Lab Duplicates) - Form VI**			
A.1.18.1	Was the lab duplicate analysis performed:			
	For each SDG?	[✓]	—	—
	On one of the SDG samples?	[✓]	—	—
	For each matrix type?	[✓]	—	—
	For each concentration range (low or med.)?	[✓]	—	—
	For each analytical Method (ICP-AES/ICP-MS, Hg, CN) Used?	[✓]	—	—
	Was a lab duplicate prepared and analyzed with the SDG samples?	[✓]	—	—

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SD018-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques / SWMU6 / 404422.

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 25.4

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M	
Aluminum	80 - 120	39700000		27000000		9890000	128.4	N	P	J+
Antimony	80 - 120	37800		1010	U	98900	38.2	N	P	J UJ
Barium	80 - 120	302000		14800		297000	96.7		P	
Beryllium	80 - 120	100000		648	J	98900	100.5		P	
Cadmium	80 - 120	91500		211	U	98900	92.5		P	
Calcium	80 - 120	15200000		6260000		9890000	90.4		P	
Cobalt	80 - 120	102000		8480		98900	94.6		P	
Copper	80 - 120	144000		44600		98900	100.5		P	
Iron	80 - 120	41800000		35300000		9890000	65.7	N	P	J UJ
Lead	80 - 120	107000		12600		98900	95.4		P	
Magnesium	80 - 120	18200000		9660000		9890000	86.3		P	
Manganese	80 - 120	431000		359000		98900	72.8	N	P	J UJ
Mercury	80 - 120	743		98.5		636	101.3		CV	
Nickel	80 - 120	105000		8430		98900	97.6		P	
Potassium	80 - 120	14600000		5360000		9890000	93.4		P	
Selenium	-								NR	
Silver	75 - 120	39600		674	U	39600	100		P	
Sodium	80 - 120	46800000		36300000		9890000	106.2		P	
Thallium	80 - 120	93000		1430	U	98900	94		P	
Vanadium	80 - 120	149000		54700		98900	95.3		P	
Zinc	80 - 120	165000		76000		98900	90		P	

Comments:

160311 1806

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SD018-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques / SWMU6 / 404422.

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 25.4

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M	
Aluminum	80 - 120	42100000		27000000		10200000	148	N	P	J+
Antimony	80 - 120	40000		1010	U	102000	39.2	N	P	J/UJ
Barium	80 - 120	312000		14800		305000	97.4		P	
Beryllium	80 - 120	103000		648	J	102000	100.3		P	
Cadmium	80 - 120	94500		211	U	102000	92.6		P	
Calcium	80 - 120	15800000		6260000		10200000	93.5		P	
Cobalt	80 - 120	104000		8480		102000	93.6		P	
Copper	80 - 120	148000		44600		102000	101.4		P	
Iron	80 - 120	42600000		35300000		10200000	71.6	N	P	J/UJ
Lead	80 - 120	109000		12600		102000	94.5		P	
Magnesium	80 - 120	18300000		9660000		10200000	84.7		P	
Manganese	80 - 120	427000		359000		102000	66.7	N	P	J/UJ
Mercury	80 - 120	803		98.5		736	95.7		CV	
Nickel	80 - 120	108000		8430		102000	97.6		P	
Potassium	80 - 120	14700000		5360000		10200000	91.6		P	
Selenium	-								NR	
Silver	75 - 120	40800		674	U	40700	100.2		P	
Sodium	80 - 120	43400000		36300000		10200000	69.6	N	P	NQ MS 01
Thallium	80 - 120	96600		1430	U	102000	94.7		P	
Vanadium	80 - 120	152000		54700		102000	95.4		P	
Zinc	80 - 120	169000		76000		102000	91.2		P	

Comments:

180311 1806

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA Sample No.

350203707A

Lab Name: PEL, Spectrum Analytical, In Contract: Vieques / SWMU6 / 404422.

Lab Code : PEL Case No.: SAS No: SDG No.: 3502037

Matrix: Soil Level:(low/med) LOW

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	80 - 120	173000.00		127934.81		50000	90.1		P
Antimony	80 - 120	495.00			U	500	99.0		P
Barium	80 - 120	1530.00		70.11		1500	97.6		P
Beryllium	80 - 120	513.00		3.08	J	500	102.0		P
Cadmium	80 - 120	471.00			U	500	94.1		P
Calcium	80 - 120	76500.00		29720.59		50000	93.6		P
Cobalt	80 - 120	522.00		40.25		500	96.4		P
Copper	80 - 120	731.00		211.82		500	103.9		P
Iron	80 - 120	205000.00		167332.63		50000	76.0		P
Lead	80 - 120	545.00		59.56		500	97.1		P
Magnesium	80 - 120	91100.00		45839.79		50000	90.6		P
Manganese	80 - 120	2120.00		1703.19		500	82.8		P
Mercury	-	7.40	U	0.41		3	113.3		CV
Nickel	80 - 120	539.00		39.99		500	99.8		P
Potassium	80 - 120	74700.00		25410.18		50000	98.7		P
Silver	80 - 120	212.00			U	200	106.2		P
Sodium	80 - 120	214000.00		172214.06		50000	84.3		P
Thallium	80 - 120	495.00			U	500	99.1		P
Vanadium	80 - 120	745.00		259.74		500	97.0		P
Zinc	80 - 120	830.00		360.86		500	93.8		P

NQ

Comments:

180311 1806

		YES	NO	N/A
	ACTION: If no for any of the above, flag (J) as estimated all the SDG sample results (detects & non-detects) for which the lab duplicate analysis was not performed.			
	NOTE: If more than one lab duplicate sample were analyzed for an SDG, then qualify the associated samples based on the worst lab duplicate analysis.			
A.1.18.2	Was a Field Blank or PE sample used for the Lab Duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) all SDG sample results (hits & non-detects) for which Field Blank or PE sample was used for duplicate analysis.			
A.1.18.3	Circle on each Form VI all values that are:			
	RPD > 20%, or			
	Absolute Difference > CRQL			
	Are all values within control limits (RPD ≤ 20% or absolute difference ≤ ±CRQL)?	[✓]	___	___
	If no, are all results outside the control limits flagged with an "*" (Lab Qualifier) on Form VI and on all Form I's?	[___]	___	✓
	ACTION: If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.			
	NOTE: The laboratory is not required to report on Form VI the RPD when both values are non-detects.			
A.1.18.4	**Aqueous**			
A.1.18.4.1	When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			

	YES	NO	N/A
is any RPD > 20% but < 100%?	___	[✓]	___
is any RPD ≥ 100%?	___	[✓]	___

ACTION:
If the RPD is > 20% but < 100%, flag (J) as estimated the associated sample data ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line the associated sample data ≥ CRQL.

(NOTE:Replace "*" with "J" or "R" as appropriate.)

x4 correction JJC 9/4/11

A.1.18.4.2 When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate values:

> ± CRQL?	___	[✓]	___
> ± 2xCRQL?	___	[✓]	___

ACTION:
If the absolute difference is > CRQL, flag as estimated all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 2xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but < 5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.18.5 **Soil/Sediment**

A.1.18.5.1 When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%?	___	[✓]	___
is any RPD ≥ 120%?	___	[✓]	___

ACTION:
If the RPD is ≥ 35% and < 120%, flag (J) as estimated the associated sample

		YES	NO	N/A
	data ≥ CRQL. If the RPD is ≥ 120%, reject (R) and red-line the associated sample data ≥ CRQL.			
A.1.18.5.2	When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and duplicate:			
	> ± 2 x CRQL?	___	[✓]	___
	> ± 4 x CRQL	___	[✓]	___

ACTION:
If the absolute difference is > 2 x CRQL, flag all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 4xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but <5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.19 Field Duplicates

Aqueous Field Duplicates

		YES	NO	N/A
A.1.19.1	Was an aqueous Field Duplicate pair collected and analyzed? (Check Sampling Trip Report)	[___]	___	✓

ACTION:
If yes, prepare a Form (Appendix A.4) for each aqueous Field Duplicate pair. Report the sample and Field Duplicate results on Appendix A.4 from their respective Form I's. Calculate and report RPD on Appendix A.4 when sample and its Field Duplicate values are both > 5xCRQL. Calculate and report the absolute difference on Appendix A.4 when at least one value (sample or duplicate) is <5xCRQL. Evaluate the aqueous Field Duplicate analysis in accordance with the

	YES	NO	N/A

QC criteria stated in Sections A.1.19.2 and A.1.19.3.

NOTE:
1. Do not transfer "**" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this the criteria to qualify the results.

A.1.19.2 Circle all values on the Form (Appendix A.4) for Field Duplicates that have:

RPD ≥ 20% or

Difference > ± CRQL

When sample and duplicate values are both ≥5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 20%?	___	[___]	✓
is any RPD ≥ 100%?	___	[___]	___

ACTION:
If the RPD is >20% but < 100%, flag (J) only the associated sample and its Field Duplicate results ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line only the associated sample and its Field Duplicate result ≥ CRQL.

A.1.19.3 When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate:

> ± CRQL?	___	[___]	✓
> ± 2 x CRQL?	___	[___]	✓

ACTION:
If the absolute difference is > CRQL, flag detects ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the difference is > 2xCRQL, reject (R) and red-line non-detects

		YES	NO	N/A

and results ≥ MDL but <5xCRQL of the sample and its Field Duplicate.

Soil/Sediment Field Duplicates

A.1.19.4 Was a soil field duplicate pair collected and analyzed? (Check Sampling Trip Report) [✓] ___ ___

SD023 / SD023P

ACTION:
If yes, for each soil Field Duplicate pair proceed as follows:

Prepare Appendix A.4 for each Field Duplicate pair. Report on Appendix A.4 all sample and its Field Duplicate results in MG/KG from their respective Form I's. Calculate and report RPD when sample and its duplicate values are both greater than 5xCRQL. Calculate and report the absolute difference when at least one value (sample or duplicate) is < 5xCRQL. Evaluate the Field Duplicate analysis in accordance with the QC Criteria stated in Sections A.1.19.5 and A.1.19.6.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and apply the criteria to qualify the results.

A.1.19.5 Circle on each Appendix A.4 all values that have:

30% RPD limit used per SAP

RPD ≥ 35%, or Difference > ± 2xCRQL When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%? ___ [___] ___

is any RPD ≥ 120%? ___ [___] ___

ACTION:
If the RPD is ≥ 35% but < 120%,

DataQual **Metals**

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD023-0211
Duplicate Sample ID: VWW06-SD023P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
aluminum	16900000	16600000	2
barium	12000	11300	6
cadmium	395	339	56
calcium	25400000	25400000	0
cobalt	5260	5180	2
copper	39600	37400	6
iron	23500000	22800000	3
lead	6940	6350	9
magnesium	9390000	8700000	8
manganese	250000	248000	1
mercury	75.4	67.6	11
nickel	7440	7150	4
potassium	3910000	3490000	11
sodium	32200000	28880000	11
thallium	1240	707	533
vanadium	33600	35200	5
zinc	51400	49600	4
arsenic	3.1	2.8	10
chromium	15	15.1	1
selenium	1.6	1.5	6

COMMENTS: 30% RPD limit for all analytes >5X LOD; +/- 2X LOD if <5X LOD - J flag
120% RPD limit or +/- 4X LOD limit for R flag.

		YES	NO	N/A
	flag only the associated sample and its Field Duplicate results ≥ CRQL as "J". If the RPD is ≥ 120%, reject (R) and red-line only the sample and its Field Duplicate results ≥ CRQL.			
A.1.19.6	When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and Field Duplicate:			
	> ± 2 x CRQL?	___	[___]	___
	> ± 4 x CRQL?	___	[___]	___
	ACTION: If the absolute difference is > 2xCRQL, flag Sample and its Field Duplicate resuts ≥ MDL but <5xCRQL as "J" and non-detects as "UJ". If the difference is >4xCRQL, reject(R) and red-line non-detects and detects ≥ MDL but <5xCRQL of the sample and its Field Duplicate.			
A.1.20	**Laboratory Control Sample (LCS)- Form VII**			
A.1.20.1	Was one LCS prepared and analyzed for:			
	Each SDG?	[✓]	___	___
	Each matrix type?	[✓]	___	___
	Each batch samples digested/distilled?	[✓]	___	___
	For each Method(ICP-AES,ICP-MS,Hg,CN) used?	[✓]	___	___
	Was an LCS prepared and analyzed with the samples?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log and contact CLP PO or TOPO for submittal of the LCS results. Flag (J) as estimated all the data for which an LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for			

	YES	NO	N/A

more than 20 samples, then the first 20 samples analyzed are not flagged(J), but all additional samples must be qualified (J).

A.1.20.2 Aqueous LCS

Circle on each Form VII the LCS percent recoveries outside control limits 80-120%.

NOTE: 1.Use digested ICV as LCS for aqueous mercury
2.Use distilled ICV as LCS for aqueous cyanide

Is any LCS recovery:

	YES	NO	N/A
Less than 50%?	___	[✓]	___
Between 50% and 79%?	___	[✓]	___
Between 121% and 150%?	___	[✓]	___
Greater than 150%?	___	[✓]	___

ACTION:
If the LCS recovery is less than 50%, reject (R) and red-line all associated sample data (detects & non-detects); for a recovery between 50-79%, flag detects as "J" all non-detects as "UJ". if the LCS recovery is between 121-150%, flag only detects as "J". if the recovery is greater than 150%, reject (R) and red-line all detects.

A.1.20.3 Solid LCS

If an analyte's MDL is equal to or greater than the true value of LCS, disregard the "Action" below for that analyte even though the LCS is out of control limits.

	YES	NO	N/A
Is the LCS "Found" value greater than the Upper Control Limit reported on Form VII?	___	[✓]	___

ACTION:

U.S. EPA - CLP

9

SERIAL DILUTIONS

EPA Sample No.: 350202102L

Lab Name: PEL, Spectrum Analytical Contract: Vieques / SWMU6 / 404422.FI.

Lab Code: PEL Case No.: SAS No: SDG No.: 3502037

Matrix: Water Level:(low/med) LOW

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	494.35		466.00	J	5.7		P
Barium	54.70		55.20		0.92		P
Beryllium	0.12	J	1.20	U			P
Calcium	106929.39		108000.00		1.0		P
Iron	1035.75		1040.00		0.41		P
Magnesium	2646.71		2680.00		1.2		P
Manganese	26.64		22.50	J	16	E	P
Nickel	-0.19	U	9.30	U			P
Potassium	37451.98		37600.00		0.40		P
Selenium	5.92	J	41.00	U			P
Sodium	55660.02		56200.00		0.97		P
Thallium	-1.74	U	44.00	U			P
Vanadium	2.69	J	4.40	U			P
Zinc	2.66	U	40.00	U			P

~~J/UJ~~ x1 corr JAC 4/14/11

No Quals - this is not a sample from this site.

Comments:

180311 1805

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

VWW06-SD018-0211

Lab Name: Mitkem Laboratories Contract: 3502037

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0225

Matrix (soil/water): SOIL Level (low/med): MED

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Arsenic	3.71		3.90		5		MS
Chromium	9.38		10.76		15	E	MS
Selenium	0.98	B	1.59		62		MS

J1UJ
NA

		YES	NO	N/A
	If yes, flag (J) all the associated detects ≥ MDL as estimated (J).			
	Is the LCS "Found" value lower than the Lower Control Limit reported on Form VII?	___	[✓]	___
	ACTION: If yes, flag detects as "J" and non-dectes as "UJ".			
A.1.21	**ICP-AES/ICP-MS Serial Dilution - Form VIII** **NOTE**: Serial dilution analysis is required only when the initial concentration is equal to or greater than 50 x MDL.			
A.1.21.1	Was a Serial Dilution analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	*[✓]	___	___
	For each matrix type?	[✓]	___	___
	For each concentration range (low or med.)?	[✓]	___	___
	Was a Serial Dilution sample analyzed with the SDG samples?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) detects ≥ MDL of all the SDG samples for which the ICP Serial Dilution Analysis was not performed.			
A.1.21.2	Was a Field Blank or PE sample used for the Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) detects ≥ MDL of all the SDG samples			
A.1.21.3	Circle on Form VIII the Percent Differences (%D) between sample results and its dilution results that are outside the control limits ± 10%			

* for ICP-MS only; for ICP-AES a non-client sample was submitted.

336

		YES	NO	N/A
	when initial concentrations ≥ 50 x MDLs.			
	Are results outside the control limits flagged with an "E" (Lab Qualifier) on Form VIII ~~and all Form I's~~? E's not on all Form I's only ICP-MS	[✓]	—	—
	ACTION: If no, write in the Contract-Problem/ Non-Compliance Section of the Data Review Narrative.			
A.1.21.4	Are any %D values:			
	> 10%?	✓	[—]	—
	≥ 100%?	—	[✓]	—
	ACTION: If the Percent Difference (%D) is greater than 10%, flag (J) as estimated all associated samples whose raw data ≥ MDL; if the %D is ≥ 100%, reject (R) and red-line all associated samples with raw data ≥ MDL. Flagged as noted on Form 9S			
	(NOTE: Replace "E" with "J" or "R" as appropriate.)			
A.1.22	Total/Dissolved or Inorganic/Total Analytes			
A.1.22.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s)?	—	[—]	✓
	Were any analyses performed for inorganic as well as total analytes on the same sample(s)?	—	[—]	✓
	ACTION: If yes, prepare a Form (Appendix A.5) to compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference on Appendix A.5 as a percent of the total analyte only when both of the following conditions are fulfilled: (1) The dissolved (or inorganic) concentration is greater than total concentration, and (2) greater than or equal to 5xMDL.			
A.1.22.2	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%?	—	[—]	✓

		YES	NO	N/A
A.1.22.3	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 50%?	___	[___]	✓

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) and red-line both the values.

A.1.23 **Field Blank - Form I**
NOTE: Designate "Field Blank" as such on Form I

VWW06-EB01-021011

A.1.23.1	Was a Field Rinsate Blank collected and analyzed with the SDG samples?	[✓]	___	___
	If yes, is any Field/Rinsate Blank absolute value of an analyte on Form I greater than its CRQL (or 2xMDL when MDL>CRQL)?	___	[✓]	___
	If yes, circle the Field Blank value on Form I that is greater than the CRQL, (or 2 x MDL when MDL > CRQL).			
	Is any Field Blank value greater than CRQL also greater than the Preparation Blank value?	___	[✓]	___
	If yes, is the Field Blank value (> CRQL and > the prep. blank value) already rejected due to other QC criteria?	[___]	___	✓

ACTION:
If the Field Blank value was not rejected, reject all associated sample data (except the Field Blank results) greater than the CRQL but less than the Field Blank value. Reject on Form I's the soil sample results whose raw values in ug/L in the instrument printout are greater than the CRQL but less than the Field Blank value in ug/L. Flag as "J" detects between the Field Blank value and 10xField Blank value. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

all FB detects were < LODs OR results in samples were > 10X FB value. No quals were required

If the Field Blank value is less than the

		YES	NO	N/A
	Prep.Blank value, do not qualify the sample results due to the Field Blank criteria.			

NOTE:
1. Field Blank result previously rejected due to other criteria cannot be used to qualify field samples.
2. Do not use Rinsate Blank associated with soils to qualify water samples and vice versa.

A.1.24 Verification of Instrumental Parameters - Form IX, XA, XB, XI

A.1.24.1	Is verification report present for:			
	Method Detection Limits (Form IX-Annually)?	[✓]	___	___
	ICP-AES Interelement Correction Factors (Form XA & XB -Quarterly)?	[✓]	___	___
	ICP-AES & ICP-MS Linear Ranges (Form XI-Quarterly)?	[✓]	___	___

ACTION:
If no, contact CLP PO/TOPO for submittal from the laboratory.

A.1.24.2 Method Detection Limits - Form IX

A.1.24.2.1	Are MDLs present on Form IX for:			
	All the analytes?	[✓]	___	___
	All the instruments used?	[✓]	___	___
	Digested and undigested samples and Calib.Blanks?	[✓]	___	___
	ICP-AES and ICP-MS when both instruments are used for the same analyte?	[___]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO/TOPO for submittal of the MDLs from the laboratory. Report to CLP PO and write in the Contract Problems/ Non-Compliance Section of the Data Review Narrative if the MDL concentration is not less than ½ CRQL.

		YES	NO	N/A
A.1.24.2.2	Is MDL greater than the CRQL for any analyte?	___	[✓]	___
	If yes, is the analyte concentration on Form I greater than 5 x MDL for the sample analyzed on the instrument whose MDL exceeds CRQL?	[___]	___	✓
	ACTION: If no, flag as estimated (J) all values less than five times MDL for the analyte whose MDL exceeds the CRQL.			
A.1.24.3	**Linear Ranges - Form XI**			
A.1.24.3.1	Was any sample result higher than the high linear range for ICP-AES or ICP-MS?	___	[✓]	___
	Was any sample result higher than the highest calibration standard for mercury or cyanide?	___	[✓]	___
	If yes for any of the above, was the sample diluted to obtain the result reported on Form I?	[___]	___	✓
	ACTION: If no, flag (J) as estimated the affected detects (≥ MDL) reported on Form I.			
A.1.25	**ICP-MS Tune Analysis - Form XIV**			
A.1.25.1	Was the ICP-MS instrument tuned prior to calibration?	[✓]	___	___
	ACTION: If no, reject (R) and red-line all sample data for which tuning was not performed.			
A.1.25.2	Was the tuning solution analyzed or scanned at least five times consecutively?	[✓]	___	___
	Were all the required isotopes spanning the analytical range present in the tuning solution?	[✓]	___	___
	Was the mass resolution within			

		YES	NO	N/A
	0.1 amu for each isotope in the tuning solution?	[✓]	___	___
	Was %RSD less than 5% for each isotope of each analyte in the tuning solution?	[✓]	___	___
	ACTION: If no for any of the above, qualify all results ≥ MDL associated with that Tune as estimated "J", and all non-detects associated with that Tune as "UJ".			
A.1.26	**ICP-MS Internal Standards - Form XV**			
A.1.26.1	Were the Internal Standards added to all the samples and all QC samples and calibration standards (except the Tuning Solution)?	[✓]	___	___
	Were all the target analyte masses bracketed by the masses of the five internal standards?	[✓]	___	___
	ACTION: If none of the Internal Standards was added to the samples, reject (R) and red-line all the associated sample data (detects & non-detects). If internal standards were used but did not cover all the analyte masses, reject (R) and red-line only the analyte results not bracketed by the internal standard masses.			
A.1.26.2	Was the intensity of an Internal Standard in each sample within 60-125% of the intensity of the same Internal Standard in the calibration blank?	[✓]	___	___
	If no, was the original sample diluted two fold, Internal Standard added and the sample re-analyzed?	[___]	___	✓
	Was the %RI for the two fold diluted sample within the acceptance limits (60-125%)?	[___]	___	✓
	ACTION: If no for any of the above, flag detects as "J" and non-detects "UJ" of all the analytes with atomic masses between the			
	atomic mass of the internal standard lighter			

than the affected internal standard, and the atomic mass of the internal standard heavier than the affected internal standard.

A.1.27 Percent Solids of Sediments

A.1.27.1 Are percent solids in sediment(s):

< 50%? ✓ ___ [___] ___

ACTION:
If yes, qualify as estimated (J) all detects and non-detects of a sample that has percent solids less than 50%(i.e.,moisture content greater than 50%).

NOTE:
Flag(J) only the sample results that were not previously flagged due to other QC criteria.

Flag J/UJ -

SD023-0211	28%
23P	28.8%
22	22.2%
21	24%
20	24.4%
19	25.4%
18	25.4%

Inorganic Data Review Narrative

Case# _____ Site: _____ Matrix: Soil ___

SDG# _____ Lab: _____ Water ___

Sampling Team: _____ Reviewer: _____ Other _____

A.2.1 Data Validation Flags:
The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as estimated

R and Red-Line - A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results ≥ MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully usable.

aboratory Qualifiers:
CLP laboratory applies a contractual qualifier on all

336

This SDG contains hexavalent chromium analysis using SW-846 7196A. Resubmissions were not required.

Laboratory: PEL

HOLDING TIMES

Sampling Date: 2/8-10/11
Received Date: 2/11/11
Analysis Dates: 2/11/11
Cooler temps: 1.1-1.8°C

Sample VWW06-EB01-021011 exceeded the required 24 hour holding time by 5 hours; therefore results were qualified as estimated (J/UJ).

All results for soil samples listed below were flagged as estimated (J/UJ) due to sample containing 50-90% moisture, per Region II guidelines.

Sample ID	% Moisture
VWW06-SD023-0211	72
VWW06-SD023P-0211	71.2
VWW06-SD022-0211	77.8
VWW06-SD021-0211	76
VWW06-SD020-0211	75.6
VWW06-SD019-0211	74.6
VWW06-SD018-0211	74.6

CALIBRATIONS

All initial calibration criteria were met. Calibration verification criteria were met for all ICV and CCV standards. No qualifications were required.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- Apply the same data validation guidelines to any associated calibration, preparation, and field QC blanks and all associated samples.
- Qualification/Action codes:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U at LOD	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD
R or J_+	The blank contaminant concentration was greater than the LOD and the sample result is greater than the LOD but less than 10X the blank contaminant concentration. The reported results are flagged either as rejected R or biased high J+ based on the professional judgment of the validator.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	RL (LOD)
VWW06-EB01-021011	hexavalent chromium	0.004J mg/L	0.007

Sample ID	Analyte	Q Flag	Q Code
no qualifications required			

The concentration noted for the CCBs is the highest concentration in all the CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for noted CCB contamination. See worksheets for associations. Samples are qualified for field QC blank contamination based on QC tracking provided by CH2M HILL. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment.

LCS

All LCS recoveries and RPDs were acceptable.

MATRIX SPIKE/DUPLICATE SUMMARY

The MS / MSD pair was submitted for sample VWW06-SD018-0211 all recoveries and RPDs were acceptable.

FIELD DUPLICATE SAMPLE SUMMARY

Note: Field duplicate results are assessed only if both results are above the CRDL.

Sample ID: **VWW06-SD023-0211** **Duplicate Sample ID:** **VWW06-SD023P-0211**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium	30400	3630	157%
			#DIV/0!
			#DIV/0!

Comments: Qualify results as estimated (J).

Sample ID: **Duplicate Sample ID:**

Analyte	Sample Conc.	Duplicate Conc.	RPD
hexachromium			#DIV/0!
			#DIV/0!
			#DIV/0!

Comments: No qualifications required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Detection limits were acceptable. Raw data was verified.

Reviewer _____ **Date:** 4/12/11

CH2M HILL
SWMU 6 CTO-111
SDG# 3502037

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

May 17, 2011
SDG# 3502434, PEL
East Vieques Island, Puerto Rico

Dear Ms. Weber,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 3502434. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for Evaluation of Metals Data (ILM05.3-Rev. 13, September 2006-SOP #HW-2) and professional judgment. The SOP for the inorganic parameters (metals) is used but is modified as necessary to reflect the QC requirements of the method and the site SAP. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	TM 6010	DM 6010
VWW06-SW001-0211	350243401	water	X	X
VWW06-SW002-0211	350243402	water	X	X
VWW06-SW003-0211	350243403	water	X	X
VWW06-SW004-0211	350243404	water	X	X
VWW06-SW005-0211	350243405	water	X	X
VWW06-SW006-0211	350243406	water	X	X
VWW06-SW007-0211	350243407	water	X	X
VWW06-SW007P-0211	350243408	water	X	X
VWW06-SW014-0211	350243409	water	X	X
VWW06-SW015-0211	350243410	water	X	X
VWW06-SW016-0211	350243411	water	X	X
VWW06-SW017-0211	350243412	water	X	X
VWW06-SW018-1211	350243413	water	X	X
VWW06-SW019-0211	350243414	water	X	X
VWW06-SW020-0211	350243415	water	X	X
VWW06-SW021-0211	350243416	water	X	X
VWW06-SW022-0211	350243417	water	X	X
VWW06-SW023-0211	350243418	water	X	X
VWW06-SW023P-0211	350243419	water	X	X
VWW06-SW004-0211 MS	350243404MS	water	X	X
VWW06-SW004-0211 MSD	350243404MSD	water	X	X
VWW06-SW016-0211 MS	350243411 MS	water	X	X
VWW06-SW016-0211 MSD	350243411 MSD	water	X	X

The following quality control samples were provided with this SDG: sample VWW06-SW007P-0211- field duplicate of sample VWW06-SW007-0211 and sample VWW06-SW023P-0211- field duplicate of sample VWW06-SW023-0211.

The samples were evaluated based on the following criteria:

• Data Completeness	*
• Sample Condition	*
• Technical Holding Times	*
• Initial/Continuing Calibrations	*
• ICSA/ICSAB Standards	*
• LLQ Standards	*
• Blanks	
• Internal Standards	NA
• Laboratory Control Samples	*
• Matrix Spike Recoveries	
• Matrix Duplicate RPDs	*
• Serial Dilutions	*
• Field Duplicates	*
• Identification/Quantitation	*
• Reporting Limits	*

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. Please note that when a compound or analyte is flagged due to blank contamination the BL qualifier code takes precedence over all other qualifier codes except a code that explains rejected data.

Please note: the validator has added a T or a D to the metals IDs to indicate total or dissolved as necessary.

Total & Dissolved Metals

One of the associated instrument blanks exhibited contamination that resulted in the qualification of one analyte in four samples.

One of the submitted MS/MSD pairs analyzed for total metals exhibited recoveries above the upper QC limit in both the MS and MSD. Associated results were qualified.

Specific Evaluation of Data

Data Completeness

The data package was received complete and intact. Resubmissions were not required.

Technical Holding Times

According to chain of custody records, sampling was performed on 2/3/11, 2/7/11 and 2/8/11 and samples were received at PEL on 2/4/11, 2/8/11 and 2/9/11. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

Blanks

Total & Dissolved Metals

Associated blanks exhibited contamination as noted in the following table.

Blank ID	Analyte	Concentration	Action Level
ICB – 6010B Total	cobalt	0.521J ug/L	LOD

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag	Q Code
VWW06-SW018-0211 T, VWW06-SW019-0211 T, VWW06-SW022-0211 T, VWW06-SW023-0211 T	cobalt	U at LOD	MBL

Matrix Spike Recoveries

Total & Dissolved Metals

The matrix spike pair submitted in this SDG exhibited non-compliant %R's, requiring qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

MS	Analytes	Samples	%R	Q Flag	Q Code
VWW06-SW004-0211 T	copper	all total field samples	133.4/142.8	J	MSH

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

CH2M HILL
SWMU 6- Vieques, Puerto Rico
SDG# 3502434

Summary of Data Qualifications

Total and Dissolved Metals

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SW018-0211 T, VWW06-SW019-0211 T, VWW06-SW022-0211 T, VWW06-SW023-0211 T	cobalt	+J	U at LOD	MBL
All total metals samples	copper	+	J	MSH

CH2M HILL
SWMU 6- Vieques, Puerto Rico
SDG# 3502434

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.

J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.

J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action - The sample result is greater than the RL and greater than ten times (10X) the blank value.

U - The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the FB result is less or greater than the RL.

R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.

J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

General Abbreviations

RL/LOD	reporting limit
PQL	practical quantitation limit
IDL	instrument detection limit
MDL	method detection limit
CRQL/LOQ	contract required quantitation limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243401

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	9.86	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	104		JMSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 51611

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243402

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	11	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	98.9	J	JMSH	P	27	54	100
7439-92-1	Lead	39.4	J		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411.1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243403

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132	U		P	66.2	132	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JMC 57611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243404

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U	~~N~~	P	66	132	200
7440-38-2	Arsenic	132	U	~~N~~	P	66.2	132	200
7440-43-9	Cadmium	15.9	J	~~N~~	P	14.4	28.8	100
7440-47-3	Chromium	17.2	U	~~N~~	P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U	~~N~~	P	7.4	14.8	200
7440-50-8	Copper	108	U	~~N~~	P	54	108	200
7439-92-1	Lead	148	U	~~N~~	P	74	148	300
7440-22-4	Silver	20.8	U	~~N~~	P	10.4	20.8	200

JC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243405

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132	U		P	66.2	132	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JAC 57611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243406

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132	U		P	66.2	132	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JC 51611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243407

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132	U		P	66.2	132	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JAE 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243408

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132	U		P	66.2	132	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JAC 5/26/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW014-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243409

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	9.74	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	101		JMSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW015-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243410

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	98.6	J	J MSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/16/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW016-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243411

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	9.35	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	82.9	~~J~~	J MSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW017-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243412

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	11.4	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	108		J MSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JLC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243413

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	36.8	J		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	~~4.11~~ 7.4	J	U MBL	P	3.7	7.4	100
7440-50-8	Copper	46.2	J	J MSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW019-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243414

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	8.76	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	~~4.5~~ 7.4	~~J~~	U MBL	P	3.7	7.4	100
7440-50-8	Copper	45	J	JMBH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JMC 57611

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SW020-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243415

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	9.14	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	40.7	J	JMSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JMC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW021-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243416

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	9.35	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	40.7	J	J MSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JMC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW022-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243417

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	11	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	~~4.25~~ 7.4	J	U MDL	P	3.7	7.4	100
7440-50-8	Copper	44	J	J MSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243418

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	72.7	J		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	9.5	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	~~4.42~~ 7.4	~~J~~	U MSL	P	3.7	7.4	100
7440-50-8	Copper	42	~~J~~	J MSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JMC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243419

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	9.58	J		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	37.3	J	JMSH	P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JMC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW001-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243401

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/16/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW002-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243402

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/16/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243403

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132.4	U		P	66.2	132.4	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JC
5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243404

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132.4	U		P	66.2	132.4	200
7440-43-9	Cadmium	28.8	U	N	P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U	N	P	54	108	200
7439-92-1	Lead	148	U	N	P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243405

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

CONCENTRATION UNITS: UG/L

Dissolved

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132.4	U		P	66.2	132.4	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243406

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132.4	U		P	66.2	132.4	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JAC 57611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243407

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132.4	U		P	66.2	132.4	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JAC 5/16/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW007P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243408

Level:(low/med) LOW Date Received: 2/4/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	132	U		P	66	132	200
7440-38-2	Arsenic	132.4	U		P	66.2	132.4	200
7440-43-9	Cadmium	28.8	U		P	14.4	28.8	100
7440-47-3	Chromium	17.2	U		P	8.6	17.2	200
7440-48-4	Cobalt	14.8	U		P	7.4	14.8	200
7440-50-8	Copper	108	U		P	54	108	200
7439-92-1	Lead	148	U		P	74	148	300
7440-22-4	Silver	20.8	U		P	10.4	20.8	200

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW014-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243409

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JLE 5/16/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW015-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243410

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 57611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW016-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243411

Level:(low/med) LOW Date Received: 2/8/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U	~~N~~	P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/16/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW017-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243412

Level:(low/med) LOW **Date Received:** 2/8/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/16/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW018-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243413

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: *UG/L*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JLC 57611

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW019-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243414

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 57611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW020-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243415

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 57611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW021-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243416

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID:

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW022-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243417

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243418

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JLC 57611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SW023P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Lab Sample ID: 350243419

Level:(low/med) LOW Date Received: 2/9/2011

PercentSolids: 0 Station ID: _____

Dissolved

CONCENTRATION UNITS: UG/L

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	66	U		P	33	66	100
7440-38-2	Arsenic	66.2	U		P	33.1	66.2	100
7440-43-9	Cadmium	14.4	U		P	7.2	14.4	50
7440-47-3	Chromium	8.6	U		P	4.3	8.6	100
7440-48-4	Cobalt	7.4	U		P	3.7	7.4	100
7440-50-8	Copper	54	U		P	27	54	100
7439-92-1	Lead	74	U		P	37	74	150
7440-22-4	Silver	10.4	U		P	5.2	10.4	100

JAC 57611

Color Before: _____ Clarity Before: _____ Texture :_____

Color After : _____ Clarity After: _____ Artifacts:_____

Comments:

130411 1743

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3502434

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

CCB951473 was analyzed on 02/17/11 12:55. The following analyte(s) were detected below RL: Silver at -0.545 UG/L.
CCB951485 was analyzed on 02/17/11 13:50. The following analyte(s) were detected below RL: Arsenic at 3.86 UG/L.

ICB960936 was analyzed on 03/14/11 10:46. The following analyte(s) were detected below RL: Arsenic at 6.96 UG/L.
CCB960904 was analyzed on 03/14/11 13:01. The following analyte(s) were detected below RL: Copper at 3.78 UG/L.
CCB960905 was analyzed on 03/14/11 13:04. The following analyte(s) were detected below RL: Copper at 3.35 UG/L.
CCB960942 was analyzed on 03/14/11 14:01. The following analyte(s) were detected below RL: Copper at 4.26 UG/L, Silver at -0.552 UG/L.

PEL Lab Reference No./SDG: 3502434

Client: CH2M Hill

CCB961057 was analyzed on 03/14/11 16:03. The following analyte(s) were detected below RL: Copper at 5.88 UG/L.
CCB961058 was analyzed on 03/14/11 16:07. The following analyte(s) were detected below RL: Copper at 5.8 UG/L.
CCB961070 was analyzed on 03/14/11 17:06. The following analyte(s) were detected below RL: Copper at 5.45 UG/L.
CCB961071 was analyzed on 03/14/11 17:09. The following analyte(s) were detected below RL: Cobalt at -0.415 UG/L, Copper at 5.42 UG/L.
CCB961083 was analyzed on 03/14/11 18:08. The following analyte(s) were detected below RL: Antimony at -3.58 UG/L, Copper at 4.18 UG/L.
ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Arsenic at 3.75 UG/L, Cobalt at 0.521 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Method Blanks:**

All acceptance criteria were met with the exception of:
Blank 78041MB was analyzed with the water samples on 03/14/11. The following analyte(s) were detected below RL: Copper at 2.84 UG/L. The hit in the blank is below the RL, therefore, no corrective action was taken.
Samples coded accordingly.

C. **Spikes:**

1. **Laboratory Control Spikes (LCS):**

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. **Post Digestion Spike:**

All acceptance criteria were met.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:

MS - VWW06-SW004-0211MS was analyzed (at a 10X dilution) with the water samples on 02/17/11. The following analyte(s) were recovered above criteria: Copper at 133.4 % with criteria of (80-120).

SD - VWW06-SW004-0211SD was analyzed (at a 10X dilution) with the water samples on 02/17/11. The following analyte(s) were recovered above criteria: Arsenic at 129.2 % with criteria of (80-120), Copper at 142.8 % with criteria of (80-120), Silver at 123 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix. The sample required a 10X dilution due to being saturated with Sodium. The LCS/LCSD pass all quality control criteria. No further action was taken.

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3502434

Client: CH2M Hill

Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW001-0211 required a 10X dilution
Sample VWW06-SW002-0211 required a 10X dilution
Sample VWW06-SW003-0211 required a 20X dilution
Sample VWW06-SW004-0211 required a 20X dilution
Sample VWW06-SW005-0211 required a 20X dilution
Sample VWW06-SW006-0211 required a 20X dilution
Sample VWW06-SW007-0211 required a 20X dilution
Sample VWW06-SW007P-0211 required a 20X dilution
Sample VWW06-SW014-0211 required a 10X dilution
Sample VWW06-SW015-0211 required a 10X dilution
Sample VWW06-SW016-0211 required a 10X dilution
Sample VWW06-SW017-0211 required a 10X dilution
Sample VWW06-SW018-0211 required a 10X dilution
Sample VWW06-SW019-0211 required a 10X dilution
Sample VWW06-SW020-0211 required a 10X dilution
Sample VWW06-SW021-0211 required a 10X dilution
Sample VWW06-SW022-0211 required a 10X dilution
Sample VWW06-SW023-0211 required a 10X dilution
Sample VWW06-SW023P-0211 required a 10X dilution

The samples required a dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All data is reported from the diluted runs with passing Internal Standard.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3502434

Client: CH2M Hill

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 04/13/2011

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244

Lab Code : PEL Case No. SDG No.: 3502434

SOW No.:

EPA Sample No	Lab Sample ID
VWW06-SW001-0211	350243401
VWW06-SW002-0211	350243402
VWW06-SW003-0211	350243403
VWW06-SW004-0211	350243404
VWW06-SW005-0211	350243405
VWW06-SW006-0211	350243406
VWW06-SW007-0211	350243407
VWW06-SW007P-0211	350243408
VWW06-SW014-0211	350243409
VWW06-SW015-0211	350243410
VWW06-SW016-0211	350243411
VWW06-SW017-0211	350243412
VWW06-SW018-0211	350243413
VWW06-SW019-0211	350243414
VWW06-SW020-0211	350243415
VWW06-SW021-0211	350243416
VWW06-SW022-0211	350243417
VWW06-SW023-0211	350243418
VWW06-SW023P-0211	350243419

Were ICP interelement corrections applied?	Yes/No	Yes
Were ICP background corrections applied?	Yes/No	Yes
If yes - were raw data generated before application of background corrections?	Yes/No	No

Comments:

130411 1743

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3502434

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:
All acceptance criteria were met. No action required. The following ICB/CCB(s) had element concentrations below the RL:

CCB951521 was analyzed on 02/17/11 16:52. The following analyte(s) were detected below RL: Silver at -0.631 UG/L.
CCB951533 was analyzed on 02/17/11 17:53. The following analyte(s) were detected below RL: Arsenic at 4.15 UG/L, Silver at -0.687 UG/L.
CCB951534 was analyzed on 02/17/11 17:56. The following analyte(s) were detected below RL: Silver at -0.565 UG/L.

ICB961289 was analyzed on 03/15/11 08:12. The following analyte(s) were detected below RL: Arsenic at 3.75 UG/L, Cobalt at 0.521 UG/L.
CCB961465 was analyzed on 03/15/11 15:46. The following analyte(s) were detected below RL: Chromium at -0.447 UG/L.

CCB961538 was analyzed on 03/16/11 00:00. The following analyte(s) were detected below RL: Chromium at -0.483 UG/L.

PEL Lab Reference No./SDG: 3502434

Client: CH2M Hill

ICB961756 was analyzed on 03/16/11 07:38. The following analyte(s) were detected below RL: Chromium at -0.56 UG/L, Cobalt at 0.379 UG/L, Silver at -0.737 UG/L.
CCB961769 was analyzed on 03/16/11 11:27. The following analyte(s) were detected below RL: Arsenic at 3.76 UG/L, Chromium at -0.642 UG/L, Silver at -1.06 UG/L.
CCB961780 was analyzed on 03/16/11 13:14. The following analyte(s) were detected below RL: Chromium at -0.545 UG/L, Silver at -0.912 UG/L.
CCB961793 was analyzed on 03/16/11 14:40. The following analyte(s) were detected below RL: Chromium at -0.531 UG/L, Silver at -0.902 UG/L. The hits in the blanks are below the RL, therefore, no corrective action was taken.

2. **Method Blanks:**

All acceptance criteria were met.

C. Spikes:

1. **Laboratory Control Spikes (LCS):**

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. **Post Digestion Spike:**

All acceptance criteria were met.

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SW004-0211MS was analyzed with the water samples on 02/17/11. The following analyte(s) were recovered above criteria: Cadmium at 121.2 % with criteria of (80-120), Copper at 135 % with criteria of (80-120), Lead at 122.8 % with criteria of (80-120).

MS - VWW06-SW016-0211MS was analyzed with the water samples on 03/15/11. The following analyte(s) were recovered above criteria: Antimony at 120.6 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix due to the LCS/LCSD passing all quality control criteria. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

CASE NARRATIVE
METALS
DISSOLVED

PEL Lab Reference No./SDG: 3502434

Client: CH2M Hill

All acceptance criteria were met.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.
Sample VWW06-SW001-0211 required a 10X dilution
Sample VWW06-SW002-0211 required a 10X dilution
Sample VWW06-SW003-0211 required a 20X dilution
Sample VWW06-SW004-0211 required a 20X dilution
Sample VWW06-SW005-0211 required a 20X dilution
Sample VWW06-SW006-0211 required a 20X dilution
Sample VWW06-SW007-0211 required a 20X dilution
Sample VWW06-SW007P-0211 required a 20X dilution
Sample VWW06-SW014-0211 required a 10X dilution
Sample VWW06-SW015-0211 required a 10X dilution
Sample VWW06-SW016-0211 required a 10X dilution
Sample VWW06-SW017-0211 required a 10X dilution
Sample VWW06-SW018-0211 required a 10X dilution
Sample VWW06-SW019-0211 required a 10X dilution
Sample VWW06-SW020-0211 required a 10X dilution
Sample VWW06-SW021-0211 required a 10X dilution
Sample VWW06-SW022-0211 required a 10X dilution
Sample VWW06-SW023-0211 required a 10X dilution
Sample VWW06-SW023P-0211 required a 10X dilution

The samples required a dilution due to being saturated with Sodium causing the Internal Standard to exceed limits. All data reported from the diluted runs with passing Internal Standard.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 04/08/2011

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244

Lab Code : PEL Case No. SDG No.: 3502434

SOW No.:

EPA Sample No	Lab Sample ID
VWW06-SW001-0211	350243401
VWW06-SW002-0211	350243402
VWW06-SW003-0211	350243403
VWW06-SW004-0211	350243404
VWW06-SW005-0211	350243405
VWW06-SW006-0211	350243406
VWW06-SW007-0211	350243407
VWW06-SW007P-0211	350243408
VWW06-SW014-0211	350243409
VWW06-SW015-0211	350243410
VWW06-SW016-0211	350243411
VWW06-SW017-0211	350243412
VWW06-SW018-0211	350243413
VWW06-SW019-0211	350243414
VWW06-SW020-0211	350243415
VWW06-SW021-0211	350243416
VWW06-SW022-0211	350243417
VWW06-SW023-0211	350243418
VWW06-SW023P-0211	350243419

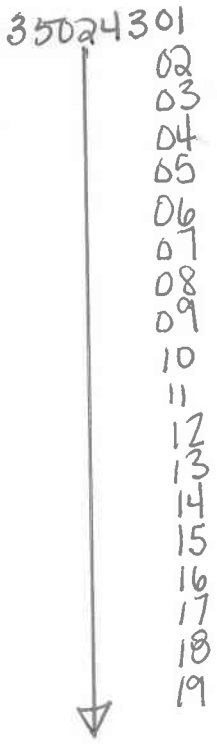
Were ICP interelement corrections applied?	Yes/No	Yes
Were ICP background corrections applied?	Yes/No	Yes
If yes - were raw data generated before application of background corrections?	Yes/No	No

Comments:

130411 1743

Runs Reprocessed for metals Sb As Cd Cr Co Cu Pb & Hg

Client ID	SDG	LabID	DL
VWW06-SW001-0211	3501997	350199709	10
VWW06-SW002-0211	3501997	350199710	10
VWW06-SW003-0211	3501977	350197701	20
VWW06-SW004-0211	3501977	350197702	20
VWW06-SW005-0211	3501977	350197705	20
VWW06-SW006-0211	3501977	350197706	20
VWW06-SW007-0211	3501977	350197707	20
VWW06-SW007P-0211	3501977	350197708	20
VWW06-SW014-0211	3501997	350199701	10
VWW06-SW015-0211	3501997	350199702	10
VWW06-SW016-0211	3501997	350199703	10
VWW06-SW017-0211	3501997	350199706	10
VWW06-SW018-0211	3502004	350200405	10
VWW06-SW019-0211	3502004	350200406	10
VWW06-SW020-0211	3502004	350200407	10
VWW06-SW021-0211	3502004	350200404	10
VWW06-SW022-0211	3502004	350200403	10
VWW06-SW023-0211	3502004	350200402	10
VWW06-SW023P-0211	3502004	350200401	10



056

PEL

A DIVISION OF SPECTRUM ANALYTICAL, INC. formerly HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3502434
RJS

Page _____ of _____

Special Handling:
TAT- Indicate Date Needed: _____
- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: _____

Project Mgr.: _____

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 402244, F1, SW.06 CTO 14

Site Name: SWMU 6

Location: Vieques State: PR

Sampler(s): _____

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9=_____ 10=_____ 11= _____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: 6010	6010 (dup)							
-01	VWW06-SW001-0211	2/7/11	1020							X	X							
-02	VWW06-SW002-0211	2/7/11	945							X	X							
-03	VWW06-SW003-0211	2/3/11	1045							X	X							
-04	VWW06-SW004-0211	2/3/11	815							X	X							
-05	VWW06-SW005-0211	2/3/11	640							X	X							
-06	VWW06-SW006-0211	2/3/11	930							X	X							
-07	VWW06-SW007-0211	2/3/11	1010							X	X							
-08	VWW06-SW008-0211	2/3/11	1010							X	X							
-09	VWW06-SW014-0211	2/7/11	910							X	X							
-10	VWW06-SW015-0211	2/7/11	850							X	X							

reload

MS-20 SD-21

QA/QC Reporting Level
☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____

State specific reporting standards:
_____

☐ E-mail to _____
EDD Format _____
_____

Relinquished by:	Received by:	Date:	Time:

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

8405 Benjamin Road, Suite A • Tampa, Florida 33634 • 813-888-9507 • FAX 813-889-7128 • www.pelab.com

3502434

201

PEL

A Division of SPECTRUM ANALYTICAL, INC. featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3502434 RJS

Page _____ of _____

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: _____

Project Mgr.: _____

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: _____

Site Name: _____

Location: _____ State: _____

Sampler(s): _____

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8=$NaHSO_4$ 9=_____ 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: 6010	6010D							
-11	VWW06-SW016-0211	2/7/11	805							X	X							MS-22 SD-23
-12	VWW06-SW017-0211	2/7/11	745							X	X							
-13	VWW06-SW018-0211	2/8/11	1010							X	X							
-14	VWW06-SW019-0211	2/8/11	945							X	X							
-15	VWW06-SW020-0211	2/8/11	930							X	X							
-16	VWW06-SW021-0211	2/8/11	835							X	X							
-17	VWW06-SW022-0211	2/8/11	0810							X	X							
-18	VWW06-SW023-0211	2/8/11	735							X	X							
-19	VWW06-SW023D-0211	2/8/11	735							X	X							

QA/QC Reporting Level

☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____

State specific reporting standards:

_____

☐ E-mail to _____

EDD Format _____

_____

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

Relinquished by:	Received by:	Date:	Time:

3502434

058

202

PEL
A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3501997
08

Page 1 of 1

Special Handling:
TAT- Indicate Date Needed: ______
- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni/WDC
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
703-376-5111 michael.zamboni@ch2m.com
Project Mgr.: Bill Hannah / UBO

Invoice To: ______
P.O. No.: ______ RQN: ______

Project No.: 402244.FI.SW.06 CTO 111
Site Name: SWMU 6
Location: Vieques State: PR
Sampler(s): D. Ballam J. Martin

1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8=$NaHSO_4$ 9=______ 10=______ 11=______

List preservative code below:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=______ X2=______ X3=______

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	~~PEST/PCBs~~	Metals	F Metals	PEST/PCBs	VOCs	PAHs			Notes:
-01	VWWC6-SW014-0211	2/7/11	0910		Aq		2		6		✓	✓	✓ PEST					
-02	VWWC6-SW015-0211	2/7/11	0850		Aq		2		6		✓	✓	PEST					
-03-04-05	VWWC6-SW016-0211	2/7/11	0805		Aq	–	6	–	18		✓	✓	✓ PEST					MS/MSD
-06	VWWC6-SW017-0211	2/7/11	745		Aq	–	2	–	6		✓	✓	PEST					
~~-07~~	~~VWAF-TB01-020711~~	~~2/7/11~~	~~0600~~		~~Aq~~	~~3~~								~~✓~~				
~~-08~~	~~VWAF-EB01-020711~~	~~2/7/11~~	~~0610~~		~~Aq~~	~~3~~	~~5~~	~~–~~	~~6~~		~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~			
-09	VWWO6-SW001-0211	2/7/11	1020		Aq	3	5		4		✓	✓	✓	✓	✓			60200L and
-10	VWW06-SW002-0211	2/7/11	0945		AQ	3	5		6		✓	✓	✓	✓	✓			60200.OL sent to
~~-11~~	~~VWAF-SB02-020911~~ Pondjent	~~2/7/11~~	~~1120~~		~~AQ~~		~~2~~		~~3~~		✓		✓ PEST					mitkem

☐ E-mail to pH2 6010, 6010D, 6020, 6020D, 8260
EDD Format double ambers received
Sample 10 = two 8260 vials broken in transit

Condition upon receipt: ☒ Iced ☐ Ambient ☒ °C 1.6, 4.6, 4.4, 3.1

Relinquished by:	Received by:	Date:	Time:
[signature]	[signature]	2-8-11	830

8405 Benjamin Road, Suite A • Tampa, Florida 33634 • 813-888-9507 • FAX 813-889-7128 • www.pelab.com

PEL
A Division of SPECTRUM ANALYTICAL, INC. Formerly HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3501977

Page 1 of 2

Special Handling:
TAT- Indicate Date Needed: _____
· All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
· Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni / WDC
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
703-376-5111, michael.zamboni@ch2m.com
Project Mgr.: Bill Hannan / VBO

Invoice To: _____
P.O. No.: _____ RQN: _____

Project No.: 402244-F1.SW.06 CTO 111
Site Name: SWMU 6
Location: Vieques, PR State: PR
Sampler(s): Dennis Ballam / John Martin

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9= ice only 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

QA/QC Reporting Level
☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____
State specific reporting standards:
_____

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: VOCs	PAHs	Pest/PCBs	Metals	F Metals	
	~~VWW06-SW001-0211~~	~~2/3/11~~				~~3~~	~~5~~		~~6~~	~~X~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	
	~~VWW06-SW002-0211~~	~~2/3/11~~				~~3~~	~~5~~		~~6~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	
-01	VWW06-SW003-0211	2/3/11	~~1045~~ 1045			3	5		6	✓	✓	✓	✓	✓	
-02-03-04	VWW06-SW004-0211	2/3/11	~~0815~~ 0815			9	15		18	✓	✓	✓	✓	✓	
-05	VWW06-SW005-0211	2/3/11	~~0640~~ 0640			3	5		6	✓	✓	✓	✓	✓	
-06	VWW06-SW006-0211	2/3/11	~~0930~~ 0930			3	5		6	✓	✓	✓	✓	✓	double amboss
-07	VWW06-SW007-0211	2/3/11	~~1010~~ 1010			3	5		6	✓	✓	✓	✓	✓	received
-08	VWW06-SW008R-0211	2/3/11	~~1010~~ 1010			3	5		6	✓	✓	✓	✓	✓	1010CL, 7.3.2CL,
-09	~~VWW06-EB01-020811~~ VWAE	2/3/11	0630			3	5		6	✓	✓	✓	✓	✓	and 7.3.4.2CL
-10	~~VWAE-TB01-020811~~	2/3/11	1130			3				✓					sent to Mitkem

☐ E-mail to temp 1.6, 2.2, 3.6, 2.9, 4.1, 3.6,
EDD Format 5.8, 4.3 pH 2 82600, 60010, 60100, 60020, 60030D 60030 and 60030D sent to mitken

Condition upon receipt: ☒ Iced ☐ Ambient ☒ °C _____

Relinquished by:	Received by:	Date:	Time:
		2-4-11	855

3502434
060
204

MITKEM LABORATORIES
A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3502004 RES

Page 1 of 2

Special Handling:
TAT- Indicate Date Needed: _____
· All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
· Samples disposed of after 30 days unless otherwise instructed.

Report To: Michael Zamboni / WDC
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
703-376-5111 michael.zamboni@ch2m.com
Project Mgr.: Bill Hannah / VBO

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 402244.FI.SW.06 CTO 111
Site Name: SWMU6
Location: Vieques State: PR
Sampler(s): D. Ballam J. Martin

1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9=_____ 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Containers:	Analyses: Pest/PCBs	Metal Hg+ HexCr (preserved HNO_3)	Metals (preserved HNO_3)	Filtered HexCr (preserved HNO_3)	Filtered Metal (preserved HNO_3)					QA/QC Reporting Level
-01	VWW06-SW023P-021	2/8/11	0735				2		6		✓	✓	✓	✓	✓					☐ Level I ☐ Level II ☐ Level III ☐ Level IV ☐ Other _____
-02	VWW-06-SW023-021	2/8/11	0735				2		6		✓	✓	✓	✓	✓					State specific reporting standards:
-03	VWW-06-SW022-021	2/8/11	0810				2		6		✓	✓	✓	✓	✓					
-04	VWW06-SW021-021	2/8/11	0835				2		6		✓	✓	✓	✓	✓					
-05	VWW06-SW018-021	MD 2/8/11	1010				2		6		✓	✓	✓	✓	✓					
-06	VWW06-SW019-021	2/8/11	0945				2		6		✓	✓	✓	✓	✓					
-07	VWW06-SW020-021	2/8/11	0930				2		6		✓	✓	✓	✓	✓					
-08	VWAE-EB01-020811	2/8/11	0600				2		6		✓	✓	✓	✓	✓					VWW06-EB01-020811 per client
-09	VWAE-EB02-020811	2/8/11	0620				2				✓	-								VWW06-EB02-020811

☐ E-mail to pH ≤ 2 8260/6010/6020, Samples -03,-04 arrived 2-10-11, No double Ambers received
EDD Format pw vials received

Astm=Faulkner OL, CRP=Aquaterra, 903, TK, AVS=m, trend

Condition upon receipt: ☒ Iced ☐ Ambient ☒ °C 1.4, 2.2, 1.6, 3.1, 3.3

Relinquished by:	Received by:	Date:	Time:
	Russell Stanton	2-9-11	900

3502434
0611
205

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	3502434	Req:	90619
Client:	CH2M Hill	Project:	CTO-083 / CTO-111 SWMU 6
Level:	4	Date Rec'd:	3/30/2011 10:00:00 AM
Rec'd via:	Fed-Ex	Due Date:	4/6/2011

Sample Verification

Samples/Cooler Secure?	Yes	All Samples on COC accounted For?	Yes
Temperature of Samples(Celsius)	4.0C	All Samples Rec'd Intact?	Yes
pH Verified?	Yes	Sample Vol. Sufficient For Analysis	Yes
pH WNL?	Yes	Samples Rec'd W/I Hold Time?	Yes
Soil Origin (Domestic/Foreign):		Are All Samples to be Analyzed?	Yes
Site Location/Project on COC?	Yes	Correct Sample Containers?	Yes
Client Project # on COC?	Yes	COC Comments written on COC?	Yes
Project Mgr. Indicated on COC?	Yes	Samplers Initials on COC?	Yes
COC relinquished/Dated by Client?	Yes	Sample Date/Time Indicated?	Yes
COC Received/Dated by PEL?	Yes	TAT Requested:	STD
Specific Subcontract Indicated?	No	Client Requests Verbal Results?	No
Samples Received By	Fed-Ex	Client Requests Faxed Results?	No
PEL to Conduct ALL Analyses?	Yes		
Radioactivity Check?	No		
COC Present?	Yes		

PEER REVIEW _____

Letter of Acceptance

Customer Name: CH2M Hill

Date and Time Received: 3/30/2011 10:00:00 AM

Date to be Reported: 4/6/2011

Laboratory Submission Number/SDG: 3502434

Get Detailed Analyte List here: www.pelab.com/webdms/Default.asp?LoaSDG=3502434

Project: Vieques SWMU 6/402244.F1.SW.06 CTO111

Samples: The submission consisted of 23 samples, including QC, with sample identification shown in the attached data tables.

Tests: The Samples will be analyzed for EPA methods: 6010, 6010_D.

Sample Custody/COC discrepancies:

None.

Notes:

SDG is a reload of previously analyzed samples per client to report 6020 metals: Sb, As, Cd, Cr, Co, Cu, Pb, and Ag.

Distribution of Report to:

CH2M Hill
Attn: Michael Zamboni
(W): 703.376.5301

Note: Submitted material will be retained for 30 days unless otherwise requested by client or consumed in analysis. PEL letters and reports are for the exclusive use of the client to whom they are addressed. Our letters and reports apply to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar materials

063

Log-in Report

Level: 4

Total of: 46 analyses on 23 samples (including QC) *31-Mar-11*

Report/SDG #: 3502434

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW001-0211	350243401		W	2/7/2011 10:20:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW002-0211	350243402		W	2/7/2011 9:45:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW003-0211	350243403		W	2/3/2011 10:45:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW004-0211	350243404		W	2/3/2011 8:15:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW005-0211	350243405		W	2/3/2011 6:40:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

Report/SDG #: 3502434

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW006-0211	350243406		W	2/3/2011 9:30:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW007-0211	350243407		W	2/3/2011 10:10:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW007P-0211	350243408		W	2/3/2011 10:10:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW014-0211	350243409		W	2/7/2011 9:10:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW015-0211	350243410		W	2/7/2011 8:50:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

Report/SDG #: 3502434

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW016-0211	350243411		W	2/7/2011 8:05:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW017-0211	350243412		W	2/7/2011 7:45:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW018-0211	350243413		W	2/8/2011 10:10:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW019-0211	350243414		W	2/8/2011 9:45:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW020-0211	350243415		W	2/8/2011 9:30:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

Report/SDG #: 3502434

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW021-0211	350243416		W	2/8/2011 8:35:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW022-0211	350243417		W	2/8/2011 8:10:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW023-0211	350243418		W	2/8/2011 7:35:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW023P-0211	350243419		W	2/8/2011 7:35:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW004-0211MS	350243420		W	2/8/2011 7:35:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

Report/SDG #: 3502434

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW004-0211SD	350243421		W	2/8/2011 7:35:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW016-0211MS	350243422		W	2/8/2011 7:35:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SW016-0211SD	350243423		W	2/8/2011 7:35:00 AM	3/30/2011 10:00:00 AM

Method		
6010	Metals	6010
6010_D	Dissolved Metals	6010

John Heyman [PEL]

From: Michael.Zamboni@CH2M.com
Sent: Tuesday, March 15, 2011 4:14 PM
To: John Heyman [PEL]
Cc: Michael.Zamboni@CH2M.com; Brett.Doerr@CH2M.com; Bill.Hannah@CH2M.com; Vickie.Weber@ch2m.com
Subject: SW/SD Metals at Navy CLEAN 1000-CTO-111 Vieques SWMU 6
Follow Up Flag: Follow up
Due By: Tuesday, March 22, 2011 8:00 AM
Flag Status: Red

Hi John H.,

Per our recent discussions, we would like you to go back and do some additional work for Vieques SWMU 6. This additional work should help us achieve our DQOs (retain low reporting limits) where interference and high salt content have been causing dilutions.

1. For sediment samples, please reanalyze 6010/6020 Metals via SW-846 6010B (as per the UFP-SAP) at a 1X to 2X dilution. 6010/6020 metals include Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Se, Ag, Na, Tl, V, and Zn. We understand that internal standards should fail at this concentration range but we should be able to get usable results. You do not need to dilute further to get detects into range (greater dilutions were already provided). Please use the same Sample IDs but report these results in a separate SDG (the data package should be fully-validatable) and SNEDD. Affected samples are:

VWW06-SD001-0211
VWW06-SD002-0211
VWW06-SD003-0211
VWW06-SD004-0211
VWW06-SD005-0211
VWW06-SD006-0211
VWW06-SD006P-0211
VWW06-SD007-0211
VWW06-SD008-0211
VWW06-SD009-0211
VWW06-SD010-0211
VWW06-SD011-0211
VWW06-SD011P-0211
VWW06-SD014-0211
VWW06-SD015-0211
VWW06-SD016-0211
VWW06-SD017-0211
VWW06-SD018-0211
VWW06-SD018-0211MS
VWW06-SD018-0211SD
VWW06-SD019-0211
VWW06-SD020-0211
VWW06-SD021-0211

VWW06-SD022-0211
VWW06-SD023-0211
VWW06-SD023P-021

That should be all of them but let me know if you think I'm missing any samples. Are there other MS/MSDs in there? This comes to 24 billable samples at $45 per sample for an estimated not-to-exceed total of $1,080. Please invoice separately as nonPO. Here are billing instructions:

Original invoices should be submitted to:

CH2M HILL INC A/P
P.O. Box 241329
Denver, CO 80224

All invoices must include the following information in order to be processed for payment:

[Unique invoice number]
[Date]
[Remit to address]
Contract # N62470-08-D-1000
"no P.O. number"
Navy CLEAN 1000 CTO-111
"no Buyer"
CH2M HILL Project Manager: Bill Hannah/VBO
Project # 404422.FI.SW.S6

Invoices that do not have the above required information will be returned to the vendor.

Inquiries concerning payment status should be directed the Accounts Payable department at (303) 771-0952, EXT 62029 or at nerapcor@CH2M.com.

2. For surface water samples, please re-report 6020 metals (as per the UFP-SAP) via SW-846 6010B. No additional reanalysis is required and existing dilution factors are approximately 20X. 6020 metals include Sb, As, Cd, Cr, Co, Cu, Pb, and Ag. Do not re-report the 6010B metals where we already have results. In this case, there shouldn't be any internal standard failures because the samples were run at appropriate dilutions. However, we understand that there will be various other sporadic QA/QC failures because these were not "analytes of interest" via SW-846 6010B. Again, please use the same Sample IDs but report these results in a separate SDG (the data package should be fully-validatable) and SNEDD. Affected samples are:

VWW06-SW001-0211
VWW06-SW002-0211
VWW06-SW003-0211
VWW06-SW004-0211
VWW06-SW005-0211
VWW06-SW006-0211
VWW06-SW007-0211
VWW06-SW007P-0211
VWW06-SW014-0211
VWW06-SW015-0211

070

VWW06-SW016-0211
VWW06-SW017-0211
VWW06-SW018-0211
VWW06-SW019-0211
VWW06-SW020-0211
VWW06-SW021-0211
VWW06-SW022-0211
VWW06-SW023-0211
VWW06-SW023P-0211

These samples have both METAL and FMETAL fractions. That should be all of them but let me know if you think I am missing any samples. Were there any MS/MSDs in there? Also, I understand that there is no charge for re-reporting of 6020 analytes from existing 6010 analyses.

3. Please let me know when we can expect these results! Don't forget to hold on to our samples so we can do specialty analysis if necessary. Also, please let me know if anything appears out of the ordinary or if there is anything here which you were not expecting.

Thanks,
Mike Z.

Michael Zamboni
Chemist
Environmental Services

CH2M HILL
15010 Conference Center Drive; Suite 200
Chantilly, VA 20151
Direct 703.376.5301
Fax 703.376.5801
Mobile 571.212.9324
www.ch2m.com

Client ID	SDG	LabID	DL
VWW06-SW001-0211	3501997	350199709	10
VWW06-SW002-0211	3501997	350199710	10
VWW06-SW003-0211	3501977	350197701	20
VWW06-SW004-0211	3501977	350197702	20
VWW06-SW005-0211	3501977	350197705	20
VWW06-SW006-0211	3501977	350197706	20
VWW06-SW007-0211	3501977	350197707	20
VWW06-SW007P-0211	3501977	350197708	20
VWW06-SW014-0211	3501997	350199701	10
VWW06-SW015-0211	3501997	350199702	10
VWW06-SW016-0211	3501997	350199703	10
VWW06-SW017-0211	3501997	350199706	10
VWW06-SW018-0211	3502004	350200405	10
VWW06-SW019-0211	3502004	350200406	10
VWW06-SW020-0211	3502004	350200407	10
VWW06-SW021-0211	3502004	350200404	10
VWW06-SW022-0211	3502004	350200403	10
VWW06-SW023-0211	3502004	350200402	10
VWW06-SW023P-0211	3502004	350200401	10

3502434
T & D Metals

	YES	NO	N/A

A.I.1 **Contract Compliance Screening Report**

Present? [ ] ___ ___ ✓

ACTION: If no, contact RSCC/PO.

A.I.2 **Record of Communication (from RSCC)**

Present? [ ] ___ ___ ✓

ACTION: If no, request from the RSCC.

A.1.3 **Sampling Trip Report**

Present and complete? [ ] ___ ___ ✓

ACTION: If no, contact RSCC/PO.

A.I.4 **Chain of Custody/Sample Traffic Report**

Present? [✓] ___ ___

Legible? [✓] ___ ___

Signature of sample custodian present? [✓] ___ ___

ACTION: If no, contact RSCC/WAM/PO.

A.I.5 **Cover Page**

Present? [✓] ___ ___

Is the Cover Page properly filled in and the verbatim signed by the lab manager or the manager's designee? [✓] ___ ___

Do the sample identification numbers on the Cover Page agree with sample Identification numbers on:

(a) Traffic Report Sheet? [ ] ___ ___ ✓

	YES	NO	N/A
(b) Form I's?	[✓]	___	___
Is the number of samples on the Cover Page the same as the number of samples on the Traffic Report sheet and the Regional Record of Communication (ROC) for the data Case?	[___]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact RSCC/PO for re-submittal of the corrected Cover Page from the laboratory.

A.1.6 **SDG Narrative, DC-1 & DC-2 Form**

Is the SDG Narrative present?	[✓]	___	___
Is Sample Log-In Sheet(Form DC-1) present and complete?	[___]	___	✓
Is Complete SDG Inventory Sheet(Form DC-2) present and complete?	[___]	___	✓

ACTION:
If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.

A.1.7 **Form I to XV**

A.1.7.1 Are all the Form I through Form XV labeled with:

Laboratory Name?	[✓]	___	___
Laboratory Code?	[✓]	___	___
RAS/Non-RAS Case No.?	[___]	✓	___
SDG No.?	[✓]	___	___

		YES	NO	N/A
	Contract No.?	[✓]	___	___

ACTION:
If no for any of the above, note under Contract Problem/Non-Compliance Section of the "Data Review Narrative" and contact PO for corrected Form(s) from the laboratory.

A.1.7.2 After comparing values on Forms I-IX against the raw data, do any computation/ transcription errors exceed 10% of the reported values on the Forms for:

(a) all analytes analyzed by ICP-AES?	___	[✓]	___
(b) all analytes analyzed by ICP-MS?	_	[___]	_✓
(c) Mercury?	_	[_]	___✓
(d) Cyanide?	_	[_]	_✓

ACTION:
If yes, prepare Telephone Record Log and contact CLP PO/TOPO for the corrected data from the laboratory.

A.1.8 Raw Data

Data shall not be validated without the hard/electronic copies of the associated raw data for samples and QC samples.

A.1.8.1 Digestion/Distillation Log

Digestion Log for ICP-AES (Form XII)present?	[✓]	___	___
Digestion Log for ICP-MS (Form XII) present?	[___]	___	___ ✓
Digestion Log for mercury (Form XII) present?	[___]	___	___ ✓
Distillation Log for cyanide (Form XII) present?	[___]	___	___ ✓

Are pH values for metals and

	YES	NO	N/A
cyanide reported for each aqueous sample?	[ ]		✓
Are percent solids calculations present for soils/sediments? Waters	[ ]		✓
Are preparation dates present on the sample preparation logs/bench sheets?	[✓]		

NOTE:
Digestion/Distillation log must include weights, volumes, and dilutions used to obtain the reported results.

A.1.8.2 Is the analytical instrument real-time printouts present for:

ICP-AES?	[✓]		
ICP-MS?	[ ]		✓
Mercury?	[ ]		✓
Cyanide?	[ ]		✓

Are all laboratory bench sheets and instrument raw data printouts necessary to support all sample analyses and QC operations:

Legible?	[✓]		
Properly labeled?	[✓]		

Are all field samples, QC samples and field QC samples present on:

Digestion/Distillation log?	[✓]		
Instrument Printouts?	[✓]		

ACTION:
If no for any of the above questions in Section A.1.8.1 and Section A.1.8.2, write Telephone Record Log and contact TOPO/PO for re-submittal from the laboratory.

076

	YES	NO	N/A

A.1.9 **Technical Holding Times**: (Aqueous and soil samples)

(Examine sample Traffic Reports and digestion/distillation logs to determine the holding time from the sample collection date to the sample preparation date.)

A.1.9.1 Cyanide distillation(14 days)exceeded? _ [ ] ✓

Mercury analysis(28 days) exceeded? _ [ ] ✓

Other Metals analysis(180 days)exceeded? ___ ___ [✓]

ACTION:
If yes, reject (R) and red-line non-detects and flag as estimated (J)results ≥ MDL even if sample(s) was preserved properly.

NOTE:
In addition to qualifying the data, a list of all samples and analytes which exceeded the holding times must be prepared. Report for each sample the number of days that were exceeded. (Subtract the sample collection date from the sample preparation date). Attach this list to the data review narrative.

A.1.9.2 Is pH of aqueous samples for:

Metals Analysis ≤ 2? [✓] ___ ___

Cyanide Analysis ≥ 12? [ ] _ _ ✓

ACTION:
If no for any of the above, flag non-detects as "R" and detects as "J".

A.1.9.3 Is the cooler temperature ≤ 10 C°? [✓] _ _

ACTION:
If cooler temperature is >10 °C , flag non-detects as "UJ" and detects as "J".

A.1.10 **Final Data Correctness - Form I**

A.1.10.1 Are Form I's for all samples

077

	YES	NO	N/A
present and complete?	[✓]		

ACTION:
If no, prepare Telephone Record Log and contact CLP PO/TOPO for submittal from the laboratory.

A.1.10.2 Verify there are no calculation and transcription errors in the results reported on Form I's. Circle on each Form I all results that are incorrect.

	YES	NO	N/A
Is the calculation error less than 10% of the correct result?	[✓]		
Are results on Form I's reported in correct units (ug/L for aqueous and MG/KG for soils)?	[✓]		
Are results on Form I'S reported by correct significant figures?	[✓]		
Are soil sample results on Form I's corrected for percent solids?	[ ]		✓
Are all "less than MDL" values reported by the ~~CRQL~~s and coded with "U"? LOD's LOD's	[✓]		
Are values less than the ~~CRQLs~~ but greater than or equal to the MDLs flagged with "J"?	[✓]		
Are appropriate contractual quality control and Method qualifiers used?	[✓]		

ACTION:
If no for any of the above questions, prepare Telephone Record Log, and contact CLP PO/TOPO for corrected data.

A.1.10.3 Do EPA sample identification numbers and the corresponding laboratory sample identification numbers match on the Cover Page, Form I's and in the raw data? [✓]

Was a brief physical description

078

AC 5/7/11

CH2M HILL VIEQUES CTO-111

~~DISSOLVED~~ METALS

SDG 3502434

ICP - AES Total	
SAMPLE ID	VWW06-SW018-0211
ANALYTE	COPPER
Lab Value CONCENTRATION (ug/L)	46.2J
AMOUNT FROM RAW DATA (ug/L)	4.63
SAMPLE SIZE (ml)	50
FINAL VOLUME (L)	50
DILUTION FACTOR	10
CONVERSION FACTOR	1
CALCULATED CONCENTRATION (ug/L)	46

FIMS Dissolved	
SAMPLE ID	
ANALYTE	
Lab Value CONCENTRATION (ug/L)	
AMOUNT FROM RAW DATA (ug/L)	
SAMPLE SIZE (ml)	
FINAL VOLUME (ml)	
DILUTION FACTOR	
DRYNESS FACTOR	
CONVERSION FACTOR	
CALCULATED CONCENTRATION (ug/L)	#DIV/0!

ICP-MS	
SAMPLE ID	
ANALYTE	
Lab Value CONCENTRATION (ug/L)	
AMOUNT FROM RAW DATA (ug/L)	
SAMPLE SIZE (ml)	
FINAL VOLUME (ml)	
DILUTION FACTOR	
DRYNESS FACTOR	
CONVERSION FACTOR	
CALCULATED CONCENTRATION (ug/L)	#DIV/0!

	YES	NO	N/A
of the samples before and after digestion given on the Form I's?	[___]	✓	
Was any sample result outside the mercury/cyanide calibration range or the ICP-AES/ICP-MS linear range diluted and noted on the Form I?	[___]	✓	

Dilutions were performed as necessary by lab.

ACTION:
If no for any of the above, note under the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.11 **Initial Calibration**

		YES	NO	N/A
A.1.11.1	Is a record of at least 2 point (A blank and a standard)calibration present for ICP-AES analysis?	[___]	✓	
	Is a record of at least 2 point (a blank and a standard)calibration present for ICP-MS analysis?	[___]		✓
	Is a record of at least 5 point calibration (a blank & 4 standards)present for Hg analysis?	[___]		✓
	Is a record of at least 4 point calibration (a blank & 4 standards)present for cyanide?	[___]		✓

ACTION:
If incomplete or no initial calibration was performed, reject (R) and red-line the associated data (detects & non-detects).

	Is one initial calibration standard at the CRQL level for cyanide and mercury?	[___]		✓

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the Data Review Narrative.

A.1.11.2 Is the curve correlation coefficient $\geq$ 0.995 for:

060

	YES	NO	N/A
Mercury Analysis?	[___]	___	✓
Cyanide Analysis?	[___]	___	✓
ICP-AES(more than 2 point Calib.)?	[___]	___	✓
ICP-MS (more than 2 point calib.)?	[___]	___	✓

ACTION:
If no, qualify the associated sample results ≥ MDL as estimated "J" and non-detects as "UJ".

NOTE:
The correlation coefficient shall be calculated by the data validator using standard concentrations and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.12 **Initial and Continuing Calibration Verification- Form IIA**

A.1.12.1 Present and complete for every metal and cyanide?	[✓]	___	___
Present and complete for ICP-AES and ICP-MS when both these methods were used for the same analyte?	[___]	___	✓

ACTION:
If no for any of the above, prepare a Telephone Record Log and contact PO/TOPO for re-submittal from the laboratory.

A.1.12.2 Was a Continuing Calibration Verification performed every 10 samples or every 2 hours whichever is more frequent?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.12.3 Was an ICV or a mid-range standard distilled and analyzed with each batch of cyanide samples?	[___]	___	✓

	YES	NO	N/A

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative and qualify results ≥ MDL as estimated (J).

A.1.12.2 Circle on each Form IIA all percent recoveries that are outside the contract windows.

Are ICV/CCVs within control limits for:

Metals - 90-110%R?	[✓]	___	___
Hg - 80-120%R?	[___]	___	✓
Cyanide - 85-115%R?	[___]	___	✓

ACTION:
If no, qualify all samples between a previous technically acceptable CCV standard and a subsequent technically acceptable CCV standard as follows as follows:

Qualify as estimated (J) all detects and non-detects, if the ICV/CCV %R is between 75-89%(65-79% for Hg; 70-84% for CN). Qualify only positive results(≥ MDL) as "J" if the ICV/CCV %R is between 111-125%(121-135% for Hg;116-130% for CN). Reject (R) and red-line only
detects if the recovery is greater than 125% (135% for Hg; 130% for CN). Reject (R) and red-line all associated results (hits and non-detects)if the recovery is less than 75%(65% for Hg;70% for CN).

NOTE:
For ICV that does not fall within the acceptance limits, qualify all samples reported from the analytical run.

A.1.12.3 Was the distilled ICV or mid-range standard for cyanide within acceptance limits (85-115%)? [___] ___ ✓

ACTION:
If no, Qualify all cyanide results ≥ MDL as "J".

A.1.13 **CRQL Standard Analysis - Form IIB**

A.1.13.1 For each ICP-AES run, was a CRI

	YES	NO	N/A
(CRQL or MDL when MDL > CRQL) standard analyzed? **(Note:CRI is not required for Al, Ba, Ca, Fe, Mg, Na and K.)**	[✓]	___	___
For each ICP-MS run, was a CRI (CRQL or MDL when MDL > CRQL) standard analyzed for each mass/isotope used for the analysis?	[___]	___	✓ ___
For each mercury run, was a CRQL standard analyzed?	[___]	___	✓
For each cyanide run, was a CRQL standard analyzed?	[___]	___	✓

ACTION:
If no for any of the above, write this deficiency in the Contract Problems/ Non-Compliance Section of the Data Review Narrative, inform CLP PO and flag results in the affected ranges (detects <2xCRQL)as J and non-detects UJ.

The affected ranges are:
ICP-AES Analysis - *True Value ± CRQL
ICP-MS Analysis - *True Value ± CRQL
Mercury Analysis - *True Value ± CRQL
Cyanide Analysis - *True Value ± CRQL
*** True value of the CRQL Standard**

A.1.13.2 Was a CRQL standard analyzed after the ICV/ICB, before the final CCV/CCB and once every 20 analytical samples in the analytical run for each analysis? [___] ✓ ___

at beginning of sequence only

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the "Data Review Narrative".

A.1.13.3 Circle on each Form IIB all percent recoveries that are outside the acceptance windows.

	YES	NO	N/A
Is the CRQL standard within control limits for:			
Metals(ICP-AES/ICP-MS)- 70 - 130%?	[✓]	___	___
Mercury- 70 - 130%?	[___]	___	✓
Cyanide - 70 - 130%?	[___]	___	✓

ACTION:
If no, flag detects <2xCRQL as "J" and non-detects as "UJ" if the CRQL standard recovery is between 50-69%. Flag(J) only detects <2xCRQL if the recovery is between 131% and ≤180%. If the recovery is less than 50%, reject(R) and red-line non-detects and detects < 2xCRQL, and flag (J) detects between 2xCRQL and ICV/CCV. Reject and red-line only detects <2xCRQL and flag (J)detects ≥ 2xCRQL but < ICV/CCV if the recovery is > 180%.

NOTE:
1. Qualify all field samples analyzed between a previous technically acceptable analysis of the CRQL standard and a subsequent acceptable analysis of the CRQL standard
2. Flag (J) or reject (R) only the final sample results on Form I's when **Sample raw data** are within the affected ranges and the CRQL standard is outside the acceptance windows.
3. The samples and the CRQL standard must be analyzed in the same analytical run.

A.1.14 Initial and Continuing Calibration Blanks - Form III

		YES	NO	N/A
A.1.14.1	Present and complete for all the instruments used for the metals and cyanide analyses?	[✓]	___	___
	Was an initial Calibration Blank analyzed after ICV?	[✓]	___	___
	Was a continuing Calibration Blank analyzed after every CCV and every 10 samples or every 2 hours, whichever is more frequent?	[✓]	___	___
	Were the ICB & CCB values ≥ MDL but < CRQL reported on Form III and flagged "J" by			

		YES	NO	N/A
	using MDLs from direct analysis(Preparation Method "NP1")? (Check Form III against the raw data)	[✓]	___	___

ACTION:
If no, inform CLP PO/TOPO and make a note in the Contract-Problems/Non-Compliance Section of the "Data Review Narrative".

A.1.14.2 Circle with red pencil on each Form III all Calib. Blank values that are:

≥ MDL but ≤ CRQL

> CRQL

A.1.14.2.1	When MDL < CRQL, is any Calib. Blank value ≥ MDL but ≤ CRQL?	✓	[___]	___

ACTION:
If yes, change sample results ≥ MDL but ≤ CRQL to the CRQL with a "U". Do not qualify non-detects.

A.1.14.2.2	When MDL < CRQL, is any Calib. Blank value > CRQL?	___	[✓]	___

ACTION:
If yes, reject (R) and red line the associated sample results > CRQL but <ICB/CCB Blank Result. Flag as "J" detects > ICB/CCB blank value but < 10xICB/CCB value. Change the sample results ≥ MDL but ≤ the CRQL to CRQL with a "U".

A.1.14.2.3	Is any Calibration Blank value below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated all associated sample results ≥ CRQL but <10xCRQL.

NOTE:

1. For ICB that does not meet the technical QC Criteria, apply the action to all samples

085

T

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

78038MB

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony	3.3	U	3.3	U	3.3	U	3.3	U	6.6	U	P
Arsenic	3.31	U	3.31	U	3.31	U	3.31	U	6.62	U	P
Cadmium	0.72	U	0.72	U	0.72	U	0.72	U	1.44	U	P
Chromium	0.43	U	0.43	U	0.43	U	0.43	U	0.86	U	P
Cobalt	0.37	U	0.37	U	0.37	U	0.37	U	0.74	U	P
Copper	2.7	U	2.7	U	2.7	U	2.7	U	5.4	U	P
Lead	3.7	U	3.7	U	3.7	U	3.7	U	7.4	U	P
Silver	0.52	U	-0.536	J	0.52	U	-0.545	J	1.04	U	P

more @220C SW004 1:20 SW005 1:20

ICB IDs: P= ICB951454

CCB1 IDs: P= CCB951459

CCB2 IDs: P= CCB951461

CCB3 IDs: P= CCB951473

130411.1743

T

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

78041MB

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L) C		C		C		Prepa-ration Blank	C	M
Antimony			3.3	U	3.3	U	3.3	U	6.6	U	P
Arsenic			3.86	J	3.31	U	3.31	U	6.62	U	P
Cadmium			0.72	U	0.72	U	0.72	U	1.44	U	P
Chromium			0.43	U	0.43	U	0.43	U	0.86	U	P
Cobalt			0.37	U	0.37	U	0.37	U	~~0.74~~	~~U~~	P
Copper			2.7	U	2.7	U	2.7	U	2.84	J	P
Lead			3.7	U	3.7	U	3.7	U	7.4	U	P
Silver			0.52	U	0.52	U	0.52	U	1.04	U	P

NQ

SW006 1:20 SW003 1:20
007
007P

ICB IDs:

CCB1 IDs: P= CCB951485

CCB2 IDs: P= CCB951497

CCB3 IDs: P= CCB951509

130411 1743

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

78044MB

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony	3.3	U	3.3	U	3.3	U	3.3	U	6.6	U	P
Arsenic	6.96	J	3.31	U	3.31	U	3.31	U	6.62	U	P
Cadmium	0.72	U	0.72	U	0.72	U	0.72	U	1.44	U	P
Chromium	0.43	U	0.43	U	0.43	U	0.43	U	0.86	U	P
Cobalt	0.37	U	0.37	U	0.37	U	0.37	U	0.74	U	P
Copper	2.7	U	2.7	U	2.7	U	3.78	J	5.4	U	P
Lead	3.7	U	3.7	U	3.7	U	3.7	U	7.4	U	P
Silver	0.52	U	0.52	U	0.52	U	0.52	U	1.04	U	P

NO

SW01L 1:10

NONE ASSOC

ICB IDs: P= ICB960936

CCB1 IDs: P= CCB960941

CCB2 IDs: P= CCB960892

CCB3 IDs: P= CCB960904

130411 1743

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony			3.3	U	3.3	U	3.3	U			P
Arsenic			3.31	U	3.31	U	3.31	U			P
Cadmium			0.72	U	0.72	U	0.72	U			P
Chromium			0.43	U	0.43	U	0.43	U			P
Cobalt			0.37	U	0.37	U	0.37	U			P
Copper			3.35	J	4.26	J	5.88	J			P
Lead			3.7	U	3.7	U	3.7	U			P
Silver			0.52	U	-0.552	J	0.52	U			P

SW016 1:10

ICB IDs:

CCB1 IDs: P= CCB960905

CCB2 IDs: P= CCB960942

CCB3 IDs: P= CCB961057

130411 1743

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C		Prepa-ration Blank	C	M
Antimony			3.3	U	3.3	U	3.3	U				P
Arsenic			3.31	U	3.31	U	3.31	U				P
Cadmium			0.72	U	0.72	U	0.72	U				P
Chromium			0.43	U	0.43	U	0.43	U				P
Cobalt			0.37	U	0.37	U	0.415	J				P
Copper			5.8	J	5.45	J	5.42	J				P
Lead			3.7	U	3.7	U	3.7	U				P
Silver			0.52	U	0.52	U	0.52	U				P

SW017 1:10
001
002
014

ICB IDs:

CCB1 IDs: P= CCB961058

CCB2 IDs: P= CCB961070

CCB3 IDs: P= CCB961071

130411 1743

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony			-3.58	J	ND						P
Arsenic			3.31	U							P
Cadmium			0.72	U							P
Chromium			0.43	U							P
Cobalt			0.37	U							P
Copper			4.18	J	ND						P
Lead			3.7	U							P
Silver			0.52	U							P

ICB IDs:

CCB1 IDs: P= CCB961083

CCB2 IDs:

CCB3 IDs:

130411 1743

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony	~~3.3~~	~~U~~	3.3	U	3.3	U	3.3	U			P
Arsenic	3.75	J	3.31	U	3.31	U	3.31	U			P
Cadmium	0.72	U	0.72	U	0.72	U	0.72	U			P
Chromium	~~0.43~~	~~U~~	0.43	U	~~0.43~~	~~U~~	0.43	U			P
Cobalt	0.521	J	0.37	U	0.437	J	0.37	U			P
Copper	2.7	U	2.7	U	2.7	U	2.7	U			P
Lead	3.7	U	3.7	U	3.7	U	3.7	U			P
Silver	0.52	U	0.52	U	0.52	U	0.52	U			P

SW0023 1:10
22
21
18
19
20
23P

none assoc

ICB IDs: P= ICB961289

CCB1 IDs: P= CCB961294

CCB2 IDs: P= CCB961296

CCB3 IDs: P= CCB961297

130411 1743

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony	3.3	U	3.3	U	3.3	U	3.3	U	6.6	U	P
Arsenic	3.31	U	3.31	U	3.31	U	3.31	U	6.62	U	P
Cadmium	0.72	U	0.72	U	0.72	U	0.72	U	1.44	U	P
Chromium	0.43	U	0.43	U	0.43	U	0.43	U	0.86	U	P
Cobalt	0.37	U	0.37	U	0.37	U	0.37	U	0.74	U	P
Copper	2.7	U	2.7	U	2.7	U	2.7	U	5.4	U	P
Lead	3.7	U	3.7	U	3.7	U	3.7	U	7.4	U	P
Silver	0.52	U	-0.536	J	0.52	U	-0.545	J	1.04	U	P

none assoc

ICB IDs: P= ICB951454

CCB1 IDs: P= CCB951459

CCB2 IDs: P= CCB951461

CCB3 IDs: P= CCB951473

130411 1744

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony			3.3	U	3.3	U	3.3	U	6.6	U	P
Arsenic			3.86	J	3.31	U	3.31	U	6.62	U	P
Cadmium			0.72	U	0.72	U	0.72	U	1.44	U	P
Chromium			0.43	U	0.43	U	0.43	U	0.86	U	P
Cobalt			0.37	U	0.37	U	0.37	U	0.74	U	P
Copper			2.7	U	2.7	U	2.7	U	5.4	U	P
Lead			3.7	U	3.7	U	3.7	U	7.4	U	P
Silver			0.52	U	0.52	U	-0.631	J	1.04	U	P

SW0004 1:20 SW0006 1:20
SW0005 1:20 SW0007 1:20
SW0007P1:20

ICB IDs:

CCB1 IDs: P= CCB951485

CCB2 IDs: P= CCB951497

CCB3 IDs: P= CCB951521

130411 1744

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil): WATER

Preparation Blank Concentration Units (ug/L or mg/Kg): UG/L

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony			3.3	U	3.3	U	3.3	U	6.6	U	P
Arsenic			4.15	J	3.31	U	3.31	U	6.62	U	P
Cadmium			0.72	U	0.72	U	0.72	U	1.44	U	P
Chromium			0.43	U	0.43	U	0.43	U	0.86	U	P
Cobalt			0.37	U	0.37	U	0.37	U	0.74	U	P
Copper			2.7	U	2.7	U	2.7	U	5.4	U	P
Lead			3.7	U	3.7	U	3.7	U	7.4	U	P
Silver			-0.687	J	-0.565	J	0.52	U	1.04	U	P

SW0006 1:20 ↓ 007 007P ↓ none 9550C SW003 1:20

ICB IDs:

CCB1 IDs: P= CCB951533

CCB2 IDs: P= CCB951534

CCB3 IDs: P= CCB951546

130411 1744

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony	3.3	U	3.3	U	3.3	U	3.3	U			P
Arsenic	3.75	J	3.31	U	3.31	U	3.31	U			P
Cadmium	0.72	U	0.72	U	0.72	U	0.72	U			P
Chromium	0.43	U	0.43	U	0.43	U	0.43	U			P
Cobalt	0.521	J	0.37	U	0.437	J	0.37	U			P
Copper	2.7	U	2.7	U	2.7	U	2.7	U			P
Lead	3.7	U	3.7	U	3.7	U	3.7	U			P
Silver	0.52	U	0.52	U	0.52	U	0.52	U			P

SW0161:10
023
022
021
018
019
020
023P

None associated

ICB IDs: P= ICB961289

CCB1 IDs: P= CCB961294

CCB2 IDs: P= CCB961296

CCB3 IDs: P= CCB961297

130411 1744

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony			3.3	U	3.3	U	3.3	U			P
Arsenic			3.31	U	3.31	U	3.31	U			P
Cadmium			0.72	U	0.72	U	0.72	U			P
Chromium			0.43	U	-0.447	J	0.43	U			P
Cobalt			0.37	U	0.37	U	0.37	U			P
Copper			2.7	U	2.7	U	2.7	U			P
Lead			3.7	U	3.7	U	3.7	U			P
Silver			0.52	U	0.52	U	0.52	U			P

none assoc 5W0116 1:10

ICB IDs:

CCB1 IDs: P= CCB961446

CCB2 IDs: P= CCB961465

CCB3 IDs: P= CCB961477

130411 1744

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C		Prepa-ration Blank	C	M
Antimony			3.3	U	3.3	U	3.3	U				P
Arsenic			3.31	U	3.31	U	3.31	U				P
Cadmium			0.72	U	0.72	U	0.72	U				P
Chromium			0.43	U	-0.483	J	0.43	U				P
Cobalt			0.37	U	0.37	U	0.37	U				P
Copper			2.7	U	2.7	U	2.7	U				P
Lead			3.7	U	3.7	U	3.7	U				P
Silver			0.52	U	0.52	U	0.52	U				P

SW023 1:10 SW022 1:10 SW020 1:10
21 023P
18
19

ICB IDs:

CCB1 IDs: P= CCB961526

CCB2 IDs: P= CCB961538

CCB3 IDs: P= CCB961550

130411 1744

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony	3.3	U	3.3	U	3.3	U	3.3	U			P
Arsenic	3.31	U	3.31	U	3.31	U	3.31	U			P
Cadmium	0.72	U	0.72	U	0.72	U	0.72	U			P
Chromium	-0.56	J	-0.488	J	-0.438	J	-0.492	J			P
Cobalt	0.379	J	0.37	U	0.466	J	0.37	U			P
Copper	2.7	U	2.7	U	2.7	U	2.7	U			P
Lead	3.7	U	3.7	U	3.7	U	3.7	U			P
Silver	-0.737	J	-0.845	J	-0.89	J	-1.05	J			P

SW017 1:10
SW001 1:10
SW002 1:10

None assoc

ICB IDs: P= ICB961756

CCB1 IDs: P= CCB961761

CCB2 IDs: P= CCB961763

CCB3 IDs: P= CCB961764

130411 1744

U.S. EPA - CLP

3

BLANKS

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.SW.06 CTO

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Preparation Blank Matrix (water/soil):

Preparation Blank Concentration Units (ug/L or mg/Kg):

D

Analyte	Initial Calib. Blank (UG/L)	C	Continuing Calibration Blank (UG/L)	C		C		C	Prepa-ration Blank	C	M
Antimony			3.3	U	3.3	U	3.3	U			P
Arsenic			3.76	J	3.31	U	3.31	U			P
Cadmium			0.72	U	0.72	U	0.72	U			P
Chromium			-0.642	J	-0.545	J	-0.531	J			P
Cobalt			0.37	U	0.37	U	0.37	U			P
Copper			2.7	U	2.7	U	2.7	U			P
Lead			3.7	U	3.7	U	3.7	U			P
Silver			-1.06	J	-0.912	J	-0.902	J			P

SW0171:10 SW0021:10
001 ↓

ICB IDs:

CCB1 IDs: P= CCB961769

CCB2 IDs: P= CCB961780

CCB3 IDs: P= CCB961793

130411 1744

	YES	NO	N/A

reported from the analytical run.
2. For CCBs that do not meet the technical QC criteria, apply the action to all samples analyzed between a previous technically acceptable analysis of CCB and a subsequent technically acceptable analysis of the CCB in the analytical run.,

A.1.15 **Preparation Blank - FORM III**

NOTE: The Preparation Blank for mercury is the same as the calibration blank.

A.1.15.1 Was one Preparation Blank prepared with and analyzed for:

Each Sample Delivery Group (SDG)?	[✓]	___	___
Each batch of the SDG samples digested/distilled?	[✓]	___	___
Each matrix type?	[✓]	___	___
All instruments used for metals and cyanide analyses?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the associated positive data <10xMDL for which the Preparation Blank was not analyzed.

NOTE:
If only one blank was analyzed for more than 20 samples, then the first 20 samples analyzed are not estimated(J),but all additional samples must be qualified (J).

A.1.15.2 Circle with red pencil on each Form III all Prep. Blank values that are:

≥ MDL but ≤ CRQL, and

> CRQL

A.1.15.2.1 When MDL < CRQL, is any preparation blank value ≥ MDL but ≤ CRQL? ✓ [___] ___

ACTION:
If yes, change sample result ≥ MDL

		YES	NO	N/A
	but ≤ CRQL to CRQL with a "U".			
A.1.15.2.2	When the MDL ≤ CRQL, is any Preparation Blank value greater than its CRQL?	___	[___] ✓	___
	If yes, is the Prep. Blank value greater than the value of the associated Field Blank collected and analyzed with the SDG samples?	___	[___]	___ ✓
	If yes, is the lowest concentration of that analyte in the associated samples less than 10 times the Preparation Blank value?	___	[___]	___ ✓

ACTION:
If yes, reject (R) and red-line all associated sample results greater than the CRQL but less than the Prep.Blank value. Flag as "J" detects > Prep. Blank value but <10xPrep.Blank. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

If the Prep. Blank value is less than the same analyte value in the Field Blank, do not qualify the sample results due to the Prep. Blank criteria.

NOTE:
Convert soil sample result to mg/Kg on wet weight basis to compare with the soil Prep. Blank result on Form III.

A.1.15.2.3	Is the Prep. Blank concentration below the negative CRQL?	___	[___] ✓	___

ACTION:
If yes, flag (J) all associated sample results less than 10xCRQL. Qualify non-detects as estimated (UJ).

A.1.15.2.4	When the MDL is greater than the CRQL, is the preparation blank concentration on Form III greater than two times the MDL?	___	[___]	___ ✓

ACTION:

102

		YES	NO	N/A
	If yes, reject (R) and red-line all positive sample results with sample raw data less than 10 times the Preparation Blank value.			
A.1.16	**ICP-AES/ICP-MS Interference Check Sample (ICS)- Form IV** **NOTE:** Not required for CN, Hg, Al, Ca, Fe and Mg.			
A.1.16.1	Present and complete?	[✓]	___	___
	Was ICS analyzed at the beginning and end of each analytical run, and once for every 20 analytical samples?	[✓] at beginning only	___	___
	Was ICS analyzed at the beginning of the ICP-MS analytical run?	[___]	___	✓
	ACTION: If no, flag as estimated (J) all sample results.			
A.1.16.2	**ICP-AES Method**			
A.1.16.2.1	**ICSA Solution:** For ICP-AES, are the ICSA "Found" analyte values within the control limits ± of CRQL of the true/established mean value?	[✓]	___	___
	If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSA Solution on Form IV?	[___]	___	✓
	ACTION: If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run: Flag (J) as estimated only sample results ≥MDL			

	YES	NO	N/A

for which the ICSA "Found' value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag non-detects as "UJ" and detects as "J".

A.1.16.2.3 **ICSAB Solution**

For ICP-AES, are all analyte results in ICSAB within the control limits of 80-120 of the true/established mean value? [✓] ___ ___

If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSAB Solution on Form IV? [___] ___ ✓

ACTION:

If yes, apply the followirg action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79%, qualify sample results ≥ MDL as "J" and non-detects as "UJ". Reject (R) and red-line all sample results (detects & non-detects) for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only positive results.

A.1.16.3 **ICP-MS Method**

A.1.16.3.1 **ICSA Solution:**

For ICP-MS, are the ICSA "Found" analyte values within the control limits of ±CRQL of the true/established mean value? [___] ___ ✓

ACTION:

If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated only sample results ≥ MDL if the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag the associated sample detects as "J" and non-detects as "UJ".

	YES	NO	N/A

A.1.16.3.3 **ICSAB Solution**

For ICP-MS, are all analyte results in ICSAB within the control limits of 80-120% of the true/established mean value, whichever is greater? [___] ___ ✓

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79% flag (J) as estimated the associated sample results ≥ MDL. Reject (R) and red-line those all sample detects and non-detects for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only detects (≥ MDL).

A.1.17 **Spiked Sample Recovery: Pre-Digestion/Pre-Distillation)-Form V A**
Note: Not required for Ca, Mg, K, and Na (both matrices); Al and Fe (soil only)

A.1.17.1 Was Matrix Spike analysis performed:

			✓
For each matrix type?	[___]	___	___
For each SDG?	[___]	___	___
On one of the SDG samples?	[___]	___	___
For each concentration range (i.e., low, med., high)?	[___]	___	___
For each analytical Method (ICP-AES, ICP-MS, Hg, CN) used?	[___]	___	___
Was a spiked sample prepared and analyzed with the SDG samples?	[___]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the positive data for which a spiked sample was not analyzed.

NOTE:
If more than one spiked sample were analyzed for one SDG, then qualify the associated data based on the worst spiked sample analysis.

		YES	NO	N/A
A.1.17.2	Was a field blank or PE sample used for the spiked sample analysis?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated positive data of the associated SDG samples for which field blank or PE sample was used for the spiked sample analysis.

A.1.17.3	Circle on each Form VA all spike recoveries that are outside the control limits (75-125%) that have sample concentrations less than four times the added spike concentrations.			
	Are all recoveries within the control limits when sample concentrations are less than or equal to four times the spike concentrations?	[___]	✓	___

NOTE:
Disregard the out of control spike recoveries for analytes whose concentrations are greater than or equal to four times the spike added.

	Are results outside the control limits (75-125%) flagged with Lab Qualifier "N" on Form I's and Form VA?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract - Problems/Non-Compliance Section of the Data Review Narrative.

A.1.17.4 **Aqueous**

Are any spike recoveries:

(a) less than 30%?	___	[✓]	___
(b) between 30-74%?	___	[✓]	___
(c) between 126-150%?	✓	[___]	___
(d) greater than 150%?	___	[✓]	___

ACTION:
If the matrix spike recovery is less than 30%, reject (R) and red-line all associated aqueous data (detects & non-detects). If between 30-74%, qualify all associated aqueous data ≥ MDL as "J" and non-detects

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques SWMU 6/402244.F

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	80 - 120	519		132	U	500	103.8		P
Arsenic	80 - 120	579		132	U	500	115.8		P
Cadmium	80 - 120	557		15.9	J	500	111.4		P
Chromium	80 - 120	533		17.2	U	500	106.6		P
Cobalt	80 - 120	550		14.8	U	500	110		P
Copper	80 - 120	664		108	U	500	133.4	N	P
Lead	80 - 120	557		148	U	500	111.4		P
Silver	80 - 120	222		20.8	U	200	111		P

Comments:

130411 1743

T

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques SWMU 6/402244.F

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	80 - 120	600		132	U	500	120		P
Arsenic	80 - 120	646		132	U	500	129.2	N	P
Cadmium	80 - 120	602		15.9	J	500	120.4		P
Chromium	80 - 120	573		17.2	U	500	114.6		P
Cobalt	80 - 120	596		14.8	U	500	119.2		P
Copper	80 - 120	714		108	U	500	142.8	N	P
Lead	80 - 120	599		148	U	500	119.8		P
Silver	80 - 120	246		20.8	U	200	123	N	P

NQ MSOK

J+

MS OK NQ

Comments:

130411 1743

108

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques SWMU 6/402244.F

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	80 - 120	554		132	U	500	110.8		P
Arsenic	80 - 120	574		132	U	500	114.8		P
Cadmium	80 - 120	606		28.8	U	500	121.2	N	P
Chromium	80 - 120	566		17.2	U	500	113.2		P
Cobalt	80 - 120	586		14.8	U	500	117.2		P
Copper	80 - 120	675		108	U	500	135	N	P
Lead	80 - 120	614		148	U	500	122.8	N	P
Silver	80 - 120	228		20.8	U	200	114		P

NQ MSD OK

NQ MSD OK

NQ

Comments:

130411 1744

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW004-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques SWMU 6/402244.F

Lab Code : PEL Case No. SAS No: SDG No.: 3502434

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	570		132	U	500	114		P
Arsenic	75 - 125	576		132	U	500	115.2		P
Cadmium	75 - 125	545		28.8	U	500	109		P
Chromium	75 - 125	517		17.2	U	500	103.4		P
Cobalt	75 - 125	528		14.8	U	500	105.6		P
Copper	75 - 125	627		108	U	500	125.4		P
Lead	75 - 125	503		148	U	500	100.6		P
Silver	75 - 125	205		20.8	U	200	102.5		P

Comments:

130411 1744

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques SWMU 6/402244.F

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	80 - 120	603		66.0	U	500	120.6	N	P
Arsenic	80 - 120	547		66.2	U	500	109.4		P
Cadmium	80 - 120	507		14.4	U	500	99.3		P
Chromium	80 - 120	501		8.60	U	500	100.2		P
Cobalt	80 - 120	495		7.40	U	500	99		P
Copper	80 - 120	602		54.0	U	500	110.2		P
Lead	80 - 120	527		74.0	U	500	105.4		P
Silver	80 - 120	214		10.4	U	200	107		P

NQ - MSDOK

Comments:

130411 1744

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SW016-0211SD

Lab Name: PEL, Spectrum Analytical Contract: Vieques SWMU 6/402244.F

Lab Code : PEL Case No. _____ SAS No: _____ SDG No.: 3502434

Matrix: WATER Level:(low/med) LOW

% Solids for Sample: 0

Dissolved

Concentration Units (mg/L or mg/kg): UG/L

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	575		66.0	U	500	115		P
Arsenic	75 - 125	538		66.2	U	500	107.6		P
Cadmium	75 - 125	503		14.4	U	500	98.5		P
Chromium	75 - 125	498		8.60	U	500	99.6		P
Cobalt	75 - 125	492		7.40	U	500	98.4		P
Copper	75 - 125	593		54.0	U	500	108.4		P
Lead	75 - 125	499		74.0	U	500	99.8		P
Silver	75 - 125	216		10.4	U	200	108		P

Comments:

130411 1744

	YES	NO	N/A

as "UJ". If between 126-150%, flag (J) all data ≥ MDL as "J". If greater than 150%, reject (R) and red-line all associated data ≥ MDL.

(**NOTE**:Replace "N" with "J", "R" as appropriate.)

A.1.17.5 **Soil/Sediment**

Are any spike recoveries:

(a) less than 10%?	___	[___]	___ ✓
(b) between 10-74%?	___	[___]	___
(c) between 126-200%?	___	[___]	___
(d) greater than 200%? ✓	___	[___]	___

ACTION:
If yes for any of the above, proceed as follows:

If the matrix spike recovery is less than 10%,reject (R) and red-line all associated data (detects & non-detects); if between 10-74%,qualify all associated data ≥ MDL as "J" and non-detects as "UJ"; if between 126-200%, flag (J) all associated data ≥ MDL as "J" If greater than 200%, reject (R) and red-line all associated data ≥ MDL.
(**NOTE**:Replace "N" with "J" or "R" as appropriate.)

A.1.18 **Lab Duplicates) - Form VI**

A.1.18.1 Was the lab duplicate analysis performed:

For each SDG?	[✓]	___	___
On one of the SDG samples?	[___]	___	___
For each matrix type?	[___]	___	___
For each concentration range (low or med.)?	[___]	___	___
For each analytical Method (ICP-AES/ICP-MS,Hg,CN)Used?	[___]	___	___
Was a lab duplicate prepared and analyzed with the SDG samples?	[___]	___	___

MS/MSD RPD's used

		YES	NO	N/A
	ACTION: If no for any of the above, flag (J) as estimated all the SDG sample results (detects & non-detects) for which the lab duplicate analysis was not performed.			
	NOTE: If more than one lab duplicate sample were analyzed for an SDG, then qualify the associated samples based on the worst lab duplicate analysis.			
A.1.18.2	Was a Field Blank or PE sample used for the Lab Duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) all SDG sample results (hits & non-detects) for which Field Blank or PE sample was used for duplicate analysis.			
A.1.18.3	Circle on each Form VI all values that are: RPD > 20%, or Absolute Difference > CRQL			
	Are all values within control limits (RPD ≤ 20% or absolute difference ≤ ±CRQL)?	[✓]	___	___
	If no, are all results outside the control limits flagged with an "*" (Lab Qualifier) on Form VI and on all Form I's?	[___]	___	✓
	ACTION: If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.			
	NOTE: The laboratory is not required to report on Form VI the RPD when both values are non-detects.			
A.1.18.4	**Aqueous**			
A.1.18.4.1	When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			

	YES	NO	N/A
is any RPD > 20% but < 100%?	___	[✓]	___
is any RPD ≥ 100%?	___	[✓]	___

ACTION:
If the RPD is > 20% but < 100%, flag (J) as estimated the associated sample data ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line the associated sample data ≥ CRQL.

(**NOTE:** Replace "*" with "J" or "R" as appropriate.)

A.1.18.4.2 When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate values:

> ± CRQL?	___	[✓]	___
> ± 2xCRQL?	___	[✓]	___

ACTION:
If the absolute difference is > CRQL, flag as estimated all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 2xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but < 5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.18.5 **Soil/Sediment**

A.1.18.5.1 When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%?	___	[___]	✓ ___
is any RPD ≥ 120%?	___	[___]	✓ ___

ACTION:
If the RPD is ≥ 35% and < 120%, flag (J) as estimated the associated sample

		YES	NO	N/A
	data ≥ CRQL. If the RPD is ≥ 120%, reject (R)and red-line the associated sample data ≥ CRQL.			
A.1.18.5.2	When the sample and/or duplicate value <5xCRQL(substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and duplicate:			
	> ± 2 x CRQL?	___	[___]	✓ ___
	> ± 4 x CRQL	___	[___]	✓ ___

ACTION:
If the absolute difference is > 2 x CRQL, flag all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 4xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but <5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.19 Field Duplicates

Aqueous Field Duplicates

		YES	NO	N/A
A.1.19.1	Was an aqueous Field Duplicate pair collected and analyzed? (Check Sampling Trip Report)	✓ [___]	___	___

ACTION:
If yes, prepare a Form (Appendix A.4) for each aqueous Field Duplicate pair. Report the sample and Field Duplicate results on Appendix A.4 from their respective Form I's. Calculate and report RPD on Appendix A.4 when sample and its Field Duplicate values are both > 5xCRQL. Calculate and report the absolute difference on Appendix A.4 when at least one value (sample or duplicate) is <5xCRQL. Evaluate the aqueous Field Duplicate analysis in accordance with the

	YES	NO	N/A

QC criteria stated in Sections A.1.19.2 and A.1.19.3.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this the criteria to qualify the results.

A.1.19.2 Circle all values on the Form (Appendix A.4) for Field Duplicates that have:

RPD ≥ 20% or

Difference > ± CRQL

When sample and duplicate values are both ≥5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 20%?	___	[✓]	___
is any RPD ≥ 100%?	___	[✓]	___

ACTION:
If the RPD is >20% but < 100%, flag (J) only the associated sample and its Field Duplicate results ≥ CRQL. If the RPD is ≥ 100%, reject(R) and red-line only the associated sample and its Field Duplicate result ≥ CRQL.

A.1.19.3 When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate:

> ± CRQL?	___	[✓]	___
> ± 2 x CRQL?	___	[✓]	___

ACTION:
If the absolute difference is > CRQL, flag detects ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the difference is > 2xCRQL, reject (R) and red-line non-detects

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SW007-0211
Duplicate Sample ID: VWW06-SW007P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
antimony			0
arsenic			0
cadmium			0
chromium			#DIV/0!
cobalt			#DIV/0!
copper			#DIV/0!
lead			0
silver			#DIV/0!

COMMENTS: 20% RPD limit for all analytes >5X LOD; +/- 1X LOD if <5X LOD - J flag
100% RPD limit or +/- 2X LOD limit for R flag.

Sample ID: VWW06-SW023-0211
Duplicate Sample ID: VWW06-SW023P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
antimony	72.7	66	6.7
arsenic	9.5	9.58	-0.08
cadmium			0
chromium			#DIV/0!
cobalt	4.42	7.4	-2.98
copper	42	37.3	4.7
lead			0
silver			#DIV/0!

COMMENTS: 20% RPD limit for all analytes >5X LOD; +/- 1X LOD if <5X LOD - J flag
100% RPD limit or +/- 2X LOD limit for R flag.

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SW007-0211
Duplicate Sample ID: VWW06-SW007P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
antimony			0
arsenic			0
cadmium			0
chromium			#DIV/0!
cobalt			#DIV/0!
copper			#DIV/0!
lead			0
silver			#DIV/0!

COMMENTS: 20% RPD limit for all analytes >5X LOD; +/- 1X LOD if <5X LOD - J flag
100% RPD limit or +/- 2X LOD limit for R flag.

Sample ID: VWW06-SW023-0211
Duplicate Sample ID: VWW06-SW023P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
antimony			0
arsenic			0
cadmium			0
chromium			#DIV/0!
cobalt			0
copper			0
lead			0
silver			#DIV/0!

COMMENTS: 20% RPD limit for all analytes >5X LOD; +/- 1X LOD if <5X LOD - J flag
100% RPD limit or +/- 2X LOD limit for R flag.

		YES	NO	N/A
	and results ≥ MDL but <5xCRQL of the sample and its Field Duplicate.			

Soil/Sediment Field Duplicates

A.1.19.4	Was a soil field duplicate pair collected and analyzed? (Check Sampling Trip Report)	[___]	___	✓ ___

ACTION:
If yes, for each soil Field Duplicate pair proceed as follows:

Prepare Appendix A.4 for each Field Duplicate pair. Report on Appendix A.4 all sample and its Field Duplicate results in MG/KG from their respective Form I's. Calculate and report RPD when sample and its duplicate values are both greater than 5xCRQL. Calculate and report the absolute difference when at least one value (sample or duplicate)is < 5xCRQL. Evaluate the Field Duplicate analysis in accordance with the QC Criteria stated in Sections A.1.19.5 and A.1.19.6.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and apply the criteria to qualify the results.

A.1.19.5	Circle on each Appendix A.4 all values that have:			
	RPD ≥ 35%, or Difference > ± 2xCRQL When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			
	is any RPD ≥ 35% but < 120%?	___	[___]	✓ ___
	is any RPD ≥ 120%?	___	[___]	✓ ___

ACTION:
If the RPD is ≥ 35% but < 120%,

		YES	NO	N/A
	flag only the associated sample and its Field Duplicate results ≥ CRQL as "J". If the RPD is ≥ 120%, reject (R) and red-line only the sample and its Field Duplicate results ≥ CRQL.			
A.1.19.6	When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and Field Duplicate:			
	> ± 2 x CRQL?	___	[___]	✓ ___
	> ± 4 x CRQL?	___	[___]	✓ ___

ACTION:
If the absolute difference is > 2xCRQL, flag Sample and its Field Duplicate resuts ≥ MDL but <5xCRQL as "J" and non-detects as "UJ". If the difference is >4xCRQL, reject(R) and red-line non-detects and detects ≥ MDL but <5xCRQL of the sample and its Field Duplicate.

A.1.20 **Laboratory Control Sample (LCS)- Form VII**

A.1.20.1	Was one LCS prepared and analyzed for:			
		✓		
	Each SDG?	[___]	___	___
	Each matrix type?	[___]	___	___
	Each batch samples digested/distilled?	[___]	___	___
	For each Method(ICP-AES,ICP-MS,Hg,CN) used?	[___]	___	___
	Was an LCS prepared and analyzed with the samples?	[___]	___	___

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO or TOPO for submittal of the LCS results. Flag (J) as estimated all the data for which an LCS was not analyzed.

NOTE:
If only one LCS was analyzed for

	YES	NO	N/A

more than 20 samples, then the first 20 samples analyzed are not flagged(J), but all additional samples must be qualified (J).

A.1.20.2 **Aqueous LCS**

Circle on each Form VII the LCS percent recoveries outside control limits 80-120%.

NOTE: 1.Use digested ICV as LCS for aqueous mercury
2.Use distilled ICV as LCS for aqueous cyanide

Is any LCS recovery:

Less than 50%?	___	[___]	___
Between 50% and 79%?	___	[___]	___
Between 121% and 150%?	___	[___]	___
Greater than 150%?	___	[___]	___

ACTION:
If the LCS recovery is less than 50%, reject (R) and red-line all associated sample data (detects & non-detects); for a recovery between 50-79%, flag detects as "J" all non-detects as "UJ". if the LCS recovery is between 121-150%, flag only detects as "J". if the recovery is greater than 150%, reject (R) and red-line all detects.

A.1.20.3 **Solid LCS**

If an analyte's MDL is equal to or greater than the true value of LCS, disregard the "Action" below for that analyte even though the LCS is out of control limits.

Is the LCS "Found" value greater than the Upper Control Limit reported on Form VII?	___	[___]	___

ACTION:

		YES	NO	N/A
	If yes, flag (J) all the associated detects ≥ MDL as estimated (J).			
	Is the LCS "Found" value lower than the Lower Control Limit reported on Form VII?	___	[___]	___ ✓
	ACTION: If yes, flag detects as "J" and non-dectes as "UJ".			
A.1.21	**ICP-AES/ICP-MS Serial Dilution - Form VIII** **NOTE:** Serial dilution analysis is required only when the initial concentration is equal to or greater than 50 x MDL.			
A.1.21.1	Was a Serial Dilution analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[___]	___	___
	For each matrix type?	[___]	___	___
	For each concentration range (low or med.)?	[___]	___	___
	Was a Serial Dilution sample analyzed with the SDG samples?	[___]	___	___
	ACTION: If no for any of the above, flag as estimated (J) detects ≥ MDL of all the SDG samples for which the ICP Serial Dilution Analysis was not performed.			
A.1.21.2	Was a Field Blank or PE sample used for the Serial Dilution Analysis?	___	[___] ✓	___
	ACTION: If yes, flag as estimated (J) detects ≥ MDL of all the SDG samples			
A.1.21.3	Circle on Form VIII the Percent Differences (%D) between sample results and its dilution results that are outside the control limits ± 10%			

		YES	NO	N/A
	when initial concentrations ≥ 50 x MDLs.			
	Are results outside the control limits flagged with an "E"(Lab Qualifier) on Form VIII and all Form I's?	[___]	___	✓

ACTION:
If no, write in the Contract-Problem/ Non-Compliance Section of the Data Review Narrative.

A.1.21.4	Are any %D values:			
	> 10%?	___	[✓]	___
	≥ 100%?	___	[✓]	___

ACTION:
If the Percent Difference (%D) is greater than 10%, flag (J) as estimated all associated samples whose **raw data** ≥ MDL; if the %D is ≥ 100%, reject (R) and red-line all associated samples with **raw data** ≥ MDL.

(**NOTE**:Replace "E" with "J" or "R" as appropriate.)

A.1.22 **Total/Dissolved or Inorganic/Total Analytes**

A.1.22.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s)?	✓	[___]	___
	Were any analyses performed for inorganic as well as total analytes on the same sample(s)?	___	[___]	✓

ACTION:
If yes, prepare a Form (Appendix A.5) to compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference on Appendix A.5 as a percent of the total analyte only when both of the following conditions are fulfilled:

(1) The dissolved(or inorganic)concentration is greater than total concentration, and
(2) greater than or equal to 5xMDL.

A.1.22.2	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%?	___	[✓]	___

		YES	NO	N/A
A.1.22.3	Is any dissolved(or inorganic) concentration greater than its total concentration by more than 50%?	___	[✓]	___

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) and red-line both the values.

A.1.23 **Field Blank - Form I**
NOTE: Designate "Field Blank" as such on Form I

A.1.23.1	Was a Field/Rinsate Bank collected and analyzed with the SDG samples?	[✓]	___	___
	If yes, is any Field/Rinsate Blank absolute value of an analyte on Form I greater than its CRQL(or 2xMDL when MDL>CRQL)?	___	[___]	✓
	If yes, circle the Field Blank value on Form I that is greater than the CRQL, (or 2 x MDL when MDL > CRQL).			
	Is any Field Blank value greater than CRQL also greater than the Preparation Blank value?	___	[___]	✓
	If yes, is the Field Blank value (> CRQL and > the prep. blank value) already rejected due to other QC criteria?	[___]	___	✓

ACTION:
If the Field Blank value was not rejected, reject all associated sample data (except the Field Blank results) greater than the CRQL but less than the Field Blank value. Reject on Form I's the soil sample results whose raw values in ug/L in the instrument printout are greater than the CRQL but less than the Field Blank value in ug/L. Flag as "J" detects between the Field Blank value and 10xField Blank value. If the sample result > MDL but ≤ CRQL, replace it with CRQL-U.

Field QC blanks were not reprocessed for the metals reported in this data pkg.

If the Field Blank value is less than the

125

		YES	NO	N/A
	Prep.Blank value, do not qualify the sample results due to the Field Blank criteria.			

NOTE:
1. Field Blank result previously rejected due to other criteria cannot be used to qualify field samples.
2. Do not use Rinsate Blank associated with soils to qualify water samples and vice versa.

A.1.24 **Verification of Instrumental Parameters - Form IX, XA, XB, XI**

A.1.24.1	Is verification report present for:			
	Method Detection Limits (Form IX-Annually)?	[✓]	___	___
	ICP-AES Interelement Correction Factors (Form XA & XB -Quarterly)?	[___]	___	___
	ICP-AES & ICP-MS Linear Ranges (Form XI-Quarterly)?	[___]	___	___

ACTION:
If no, contact CLP PO/TOPO for submittal from the laboratory.

A.1.24.2 **Method Detection Limits - Form IX**

A.1.24.2.1	Are MDLs present on Form IX for:			
	All the analytes?	[✓]	___	___
	All the instruments used?	[___]	___	___
	Digested and undigested samples and Calib.Blanks?	[___]	___	___
	ICP-AES and ICP-MS when both instruments are used for the same analyte?	[___]	___	___

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO/TOPO for submittal of the MDLs from the laboratory. Report to CLP PO and write in the Contract Problems/ Non-Compliance Section of the Data Review Narrative if the MDL concentration is not less than ½ CRQL.

		YES	NO	N/A
A.1.24.2.2	Is MDL greater than the CRQL for any analyte?	___	[___]	___
	If yes, is the analyte concentration on Form I greater than 5 x MDL for the sample analyzed on the instrument whose MDL exceeds CRQL?	[___]	___	___

ACTION:
If no, flag as estimated (J) all values less than five times MDL for the analyte whose MDL exceeds the CRQL.

A.1.24.3 **Linear Ranges - Form XI**

A.1.24.3.1	Was any sample result higher than the high linear range for ICP-AES or ICP-MS?	___	[___]	___
	Was any sample result higher than the highest calibration standard for mercury or cyanide?	___	[___]	___
	If yes for any of the above, was the sample diluted to obtain the result reported on Form I?	[___]	___	___

ACTION:
If no, flag (J) as estimated the affected detects (≥ MDL) reported on Form I.

A.1.25 **ICP-MS Tune Analysis - Form XIV**

A.1.25.1	Was the ICP-MS instrument tuned prior to calibration?	[___]	___	___

ACTION:
If no, reject (R) and red-line all sample data for which tuning was not performed.

A.1.25.2	Was the tuning solution analyzed or scanned at least five times consecutively?	[___]	___	___
	Were all the required isotopes spanning the analytical range present in the tuning solution?	[___]	___	___
	Was the mass resolution within			

		YES	NO	N/A
	0.1 amu for each isotope in the tuning solution?	[___]	___	✓
	Was %RSD less than 5% for each isotope of each analyte in the tuning solution?	[___]	___	✓

ACTION:
If no for any of the above, qualify all results ≥ MDL associated with that Tune as estimated "J", and all non-detects associated with that Tune as "UJ".

A.1.26 **ICP-MS Internal Standards - Form XV**

A.1.26.1	Were the Internal Standards added to all the samples and all QC samples and calibration standards (except the Tuning Solution)?	[___]	___	✓
	Were all the target analyte masses bracketed by the masses of the five internal standards?	[___]	___	✓

ACTION:
If none of the Internal Standards was added to the samples, reject (R) and red-line all the associated sample data (detects & non-detects). If internal standards were used but did not cover all the analyte masses, reject (R) and red-line only the analyte results not bracketed by the internal standard masses.

A.1.26.2	Was the intensity of an Internal Standard in each sample within 60-125% of the intensity of the same Internal Standard in the calibration blank?	[___]	___	✓
	If no, was the original sample diluted two fold, Internal Standard added and the sample re-analyzed?	[___]	___	✓
	Was the %RI for the two fold diluted sample within the acceptance limits (60-125%)?	[___]	___	✓

ACTION:
If no for any of the above, flag detects as "J" and non-detects "UJ" of all the analytes with atomic masses between the

atomic mass of the internal standard lighter

than the affected internal standard, and the atomic mass of the internal standard heavier than the affected internal standard.

A.1.27 **Percent Solids of Sediments**

A.1.27.1 Are percent solids in sediment(s):

< 50%? ___ [___] ___

ACTION:
If yes, qualify as estimated (J) all detects and non-detects of a sample that has percent solids less than 50%(i.e.,moisture content greater than 50%).

NOTE:
Flag(J) only the sample results that were not previously flagged due to other QC criteria.

Inorganic Data Review Narrative

Case# _____ **Site:** _____ **Matrix: Soil** ____

SDG# _____ **Lab:** _____ **Water** ____

Sampling Team: _____ **Reviewer:** _____ **Other** _____

A.2.1 **Data Validation Flags:**
The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as **estimated**

R and Red-Line - A red-line drawn through a sample result indicates **unusable** value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results ≥ MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully **usable**.

A.2.2 **Laboratory Qualifiers:**
The CLP laboratory applies a contractual qualifier on all

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

May 17, 2011
SDG# 3502499 R1, PEL
Vieques Island, Puerto Rico

Dear Ms. Weber,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 3502499 R1. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Evaluation of Metals Data (ILM05.3-Rev. 13, September 2006-SOP #HW-2) and professional judgment. The SOP for the inorganic parameters (metals) is used but is modified as necessary to reflect the QC requirements of the method and the site SAP. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	Metals 6010B
VVW06-SD003-0211	3502499-01	soil	X
VVW06-SD004-0211	3502499-04	soil	X
VVW06-SD005-0211	3502499-05	soil	X
VVW06-SD006-0211	3502499-06	soil	X
VVW06-SD006P-0211	3502499-07	soil	X
VVW06-SD007-0211	3502499-08	soil	X
VVW06-SD008-0211	3502499-09	soil	X
VVW06-SD009-0211	3502499-10	soil	X
VVW06-SD0010-0211	3502499-11	soil	X
VVW06-SD0011-0211	3502499-12	soil	X
VVW06-SD0011P-0211	3502499-13	soil	X
VVW06-SD003-0211 MS	3502499-03 MS	soil	X
VVW06-SD003-0211 MSD	3502499-03 MSD	soil	X

The following quality control samples were provided with this SDG: sample VWW06-SD006P-0211- field duplicate of sample VWW06-SD006-0211 and sample VWW06-SD0011P-0211- field duplicate of sample VWW06-SD0011-0211.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times *
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- LLQ Standards *
- Blanks *
- Internal Standards *
- Laboratory Control Samples *
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates
- Identification/Quantitation *
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. Please note that when a compound or analyte is flagged due to blank contamination the BL qualifier code takes precedence over all other qualifier codes except a code that explains rejected data.

Select Metals

Several samples were received in coolers that were at 9.9 °C – 10.5 °C. All results for these samples were flagged as estimated J/UJ based on the method and the client Sampling and Analysis Plan (SAP) requirement that cooler temperatures be maintained at 4°C +/- 2°C.

All results for one soil sample were qualified as estimated due to high percent moisture content.

Select Metals

The submitted MS/MSD pair exhibited recoveries that were non-compliant. Therefore, qualifications to the data were required.

One of the field duplicate pairs exhibited non-compliant RPDs. Qualifications were required in the field duplicate pair only.

Specific Evaluation of Data

Data Completeness

This data package was received complete and intact. Resubmissions were not required.

Sample Condition

Select Metals

The following soil sample contained 50-90% water. All reported results in the sample required qualification as estimated.

Sample ID	% Moisture	Qualifier	Q Code
VWW06-SD009-0211	67.9	J/UJ	%SOL

Select Metals

Samples VWW06-SD005-0211, VWW06-SD006-0211, VWW06-SD006P-0211, VWW06-SD007-0211, VWW06-SD008-0211, VWW06-SD009-0211, VWW06-SD0010-0211, VWW06-SD0011-0211 and VWW06-SD0011P-0211 were received at the laboratory in two coolers at temperatures of 9.9°C and 10.5°C. Samples were maintained at this temperature for several days as samples were collected on 2/4/11 and received at the laboratory on 2/7/11. Both the method and the client SAP require that samples be stored at 4°C; therefore due to the temperature non-compliance samples were qualified as estimated (J/UJ), qualifier code: OT.

Technical Holding Times

According to chain of custody records, sampling was performed on 2/4/11 and samples were received at PEL on 2/7/11. The samples were re-logged in on 4/5/11 for 6010B analysis for antimony and silver only. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

Matrix Spike Recoveries

Metals

The matrix spike pair submitted in this SDG exhibited non-compliant %R's for several analytes, requiring qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table. Please note that results were not qualified unless both recoveries were non-compliant. Also, criteria did not apply to several analytes due to the abundance of the target analyte in the native sample. Further, results were not rejected unless recoveries were both above 200%.

MS	Analytes	Samples	%R	Q Flag	Q Code
VWW06-SD003-0211	antimony	all soil samples	54.6/54	J/UJ	MSL

Field Duplicate

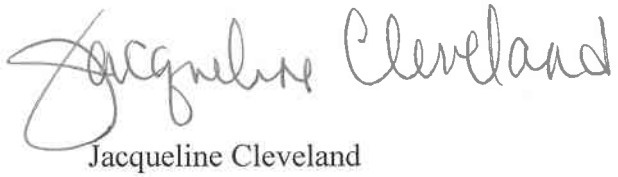
Metals

The field duplicate pair of samples VWW06-SD006-0211 and VWW06-SD006P-0211exhibited one analyte with a high RPD (>30% per SAP). A summary of the non-compliant results and affected samples are noted in the following table. Qualifications were applied to the field duplicate pair only.

Field Dup Pair ID	Analyte	RPD	Qualifier	Q Code
VWW06-SD006-0211 VWW06-SD006P-0211	antimony	55	J	FD

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Jacqueline Cleveland
Vice President

Summary of Data Qualifications

Metals

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD009-0211*	all analytes	+/-	J/UJ	%SOL
VWW06-SD005-0211, VWW06-SD006-0211, VWW06-SD006P-0211, VWW06-SD007-0211, VWW06-SD008-0211, VWW06-SD009-0211, VWW06-SD0010-0211, VWW06-SD0011-0211, VWW06-SD0011P-0211	all analytes	+/-	J/UJ	OT
all soil samples*	antimony	+	J/UJ	MSL
VWW06-SD006-0211*, VWW06-SD006P-0211*	antimony	+	J	FD

**final qualifier due to high cooler temperature, qualifier code OT in all samples noted in 2nd row of the table above.*

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.

J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.

J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action - The sample result is greater than the RL and greater than ten times (10X) the blank value.

U - The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the RL* or at the reported concentration**, when the FB result is less or greater than the RL.

R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.

J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

General Abbreviations

RL/LOD	reporting limit
PQL	practical quantitation limit
IDL	instrument detection limit
MDL	method detection limit
CRQL/LOQ	contract required quantitation limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

CH2M HILL
Vieques, PR - SWMU 6
SDG# 3502499 R1

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD003-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249901

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 52 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	3190		J	P	350	699	1460
7440-22-4	Silver	295	J		P	233	466	728

JMC 51611

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD004-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249904

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 52.7 Station ID: _____

CONCENTRATION UNITS: *UG/KG*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	1120	J	J MDL	P	330	659	1370
7440-22-4	Silver	246	J		P	220	439	686

JAC 51611

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD005-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249905

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 60.7 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	631	U	WJ OT	P	315	631	1310
7440-22-4	Silver	420	U	WJ OT	P	210	420	657

JC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD006-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249906

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 59.1 Station ID: _____

CONCENTRATION UNITS: *UG/KG*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	1720		J QT	P	304	609	1270
7440-22-4	Silver	406	U	UJ ↓	P	203	406	634

JAC 5/16/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD006P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249907

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 56.6 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	3040		J OT	P	369	739	1540
7440-22-4	Silver	492	U	UJ ↓	P	246	492	770

JMC 5/16/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD007-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249908

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 50.8 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	717	U	UJ OT	P	358	717	1490
7440-22-4	Silver	478	U	UJ ↓	P	239	478	747

JAC 5/16/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD008-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249909

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 78.6 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	456	U	UJ QT	P	228	456	951
7440-22-4	Silver	304	U	UJ ↓	P	152	304	475

JAC 51611

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.: VWW06-SD009-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249910

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 32.1 Station ID: _____

CONCENTRATION UNITS: *UG/KG*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	2200	J	J OT	P	590	1180	2460
7440-22-4	Silver	787	U	U ↓	P	394	787	1230

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments: _____

270411 1715

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD010-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249911

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 61.4 Station ID: _____

CONCENTRATION UNITS: *UG/KG*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	396	J	J OT	P	276	551	1150
7440-22-4	Silver	368	U	UT ↓	P	184	368	574

JLC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD011-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249912

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 91.9 Station ID: _____

CONCENTRATION UNITS: *UG/KG*

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	484	U	UJ DT	P	242	484	1010
7440-22-4	Silver	322	U	UJ ↓	P	161	322	504

JAC 5/20/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA Sample No.

VWW06-SD011P-0211

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.F1.S

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Lab Sample ID: 350249913

Level:(low/med) LOW Date Received: 4/5/2011

PercentSolids: 92 Station ID: _____

CONCENTRATION UNITS: UG/KG

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL	LOD	LOQ
7440-36-0	Antimony	452	U	UJ QT	P	226	452	942
7440-22-4	Silver	301	U	UJ ↓	P	151	301	471

JAC 5/6/11

Color Before: _____ Clarity Before: _____ Texture : _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

270411 1718

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3502499

Client: CH2M Hill

I. RECEIPT

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Analyses were performed according to the PEL, a Division of Spectrum Analytical, Standard Operating Procedures and EPA Method 6010B for ICP metals.

IV. PREPARATION

Soil samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3050B.

V. ANALYSIS

A. Calibration:

All acceptance criteria were met.

B. Blanks:

1. Calibration Blanks:

All acceptance criteria were met.

2. Method Blanks:

All acceptance criteria were met.

C. Spikes:

1. Laboratory Control Spikes (LCS):

An LCS/LCSD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met.

2. Post Digestion Spike:

All acceptance criteria were met.

CASE NARRATIVE
METALS

PEL Lab Reference No./SDG: 3502499

Client: CH2M Hill

3. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

A client requested MS/SD set was analyzed.
All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
MS - VWW06-SD003-0211MS was analyzed with the soil samples on 04/14/11. The following analyte(s) were recovered below criteria: Antimony at 54.6 % with criteria of (80-120).

SD - VWW06-SD003-0211MSD was analyzed with the soil samples on 04/14/11. The following analyte(s) were recovered below criteria: Antimony at 54 % with criteria of (80-120). The most probable cause for the MS/MSD exceeding limits is sample matrix. The LCS/LCSD pass all quality control criteria. No further action was taken.
Samples coded accordingly.

D. Duplicate:

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

E. Serial Dilution:

All acceptance criteria were met.

F. ICP Interference Check Samples:

All acceptance criteria were met.

G. Samples:

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and PEL, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: _____
Name: Troy L. Roberts Title: Inorg. Manager

SIGNED: **DATE:** 04/26/2011

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: PEL, Spectrum Analytical, Inc. Contract: Vieques SWMU 6/402244.

Lab Code : PEL Case No.: _____ SDG No.: 3502499

SOW No.: _____

EPA Sample No	Lab Sample ID
VWW06-SD003-0211	350249901
VWW06-SD004-0211	350249904
VWW06-SD005-0211	350249905
VWW06-SD006-0211	350249906
VWW06-SD006P-0211	350249907
VWW06-SD007-0211	350249908
VWW06-SD008-0211	350249909
VWW06-SD009-0211	350249910
VWW06-SD010-0211	350249911
VWW06-SD011-0211	350249912
VWW06-SD011P-0211	350249913

Were ICP interelement corrections applied? Yes/No Yes

Were ICP background corrections applied? Yes/No Yes

If yes - were raw data generated before application of background corrections? Yes/No No

Comments:

270411 1718

PEL

A Division of SPECTRUM ANALYTICAL, INC. Formerly HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3502499 RJS

Page _____ of _____

Special Handling:
TAT- Indicate Date Needed: _____
- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: _____

Project Mgr.: _____

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 402244.F1.SW.06 CTO11

Site Name: SWMU 6

Location: Vieques State: PR

Sampler(s): _____

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9=_____ 10=_____ 11= _____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: 6010 - Sb/Ag	QA/QC Reporting Level
-01	VWW06-SD003-0211	2/4/11	1025							X	
-02	VWW06-SD003-0211MS		1025							X	
-03	VWW06-SD003-0211MSD		1025							X	
-04	VWW06-SD004-0211		1105							X	
-05	VWW06-SD005-0211		930							X	
-06	VWW06-SD006-0211		825							X	
-07	VWW06-SD006P-0211		825							X	
-08	VWW06-SD007-0211		900							X	
-09	VWW06-SD008-0211		1000							X	
-10	VWW06-SD009-0211		945							X	

☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____

State specific reporting standards:

☐ E-mail to _____

EDD Format Perm per Client @ 1x or 2x

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

Relinquished by:	Received by:	Date:	Time:
	Russell Stott	4-5-11	1335

3502499 R1

023

45

PEL

A DIVISION OF SPECTRUM ANALYTICAL, INC. (formerly HANNIBAL TECHNOLOGY)

3502499 RUS

CHAIN OF CUSTODY RECORD

Page _____ of _____

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: _____

Project Mgr.: _____

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: _____

Site Name: _____

Location: _____ State: _____

Sampler(s): _____

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9=_____ 10=_____ 11= _____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: 6010-Ag,Sb							
-11	VWW06-SD010-024	2/4/11	945							X							
-12	VWW06-SD011-024	↓	735							X							
-13	VWW06-SD011P-024	↓	735							X							

QA/QC Reporting Level

☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____

State specific reporting standards:

_____

	Relinquished by:	Received by:	Date:	Time:
		Russell Slack	4-5-11	1335

☐ E-mail to _____

EDD Format _____

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

024

Russell Stallone [PEL]

From: John Heyman [PEL]
Sent: Tuesday, April 05, 2011 1:35 PM
To: LogIn [PEL]
Cc: Project Managers [PEL]
Subject: Vieques soils for 6010 re-runs and Vieques waters to make sure we have volume left

Please pull the following soils to re-login for 6010 Sb and Ag:

Client ID	SDG	Lab ID
VWW06-SD003-0211	3501993	350199301
VWW06-SD004-0211	3501993	350199304
VWW06-SD005-0211	3501993	350199305
VWW06-SD006-0211	3501993	350199306
VWW06-SD006P-0211	3501993	350199307
VWW06-SD007-0211	3501993	350199308
VWW06-SD008-0211	3501993	350199309
VWW06-SD009-0211	3501993	350199310
VWW06-SD010-0211	3501993	350199311
VWW06-SD011-0211	3501993	350199312
VWW06-SD011P-0211	3501993	350199313

MS/SD

90619

- PerClient, rerun @ 1x or 2x
- Turn IS off

Also, please locate the following waters (any volume preserved or unpreserved). The client may have us send these out to another lab:

WW06-SW001-0211	3501997	350199709
WW06-SW002-0211	3501997	350199710
WW06-SW003-0211	3501977	350197701
WW06-SW004-0211	3501977	350197702
WW06-SW005-0211	3501977	350197705
WW06-SW006-0211	3501977	350197706
WW06-SW007-0211	3501977	350197707
WW06-SW007P-0211	3501977	350197708
WW06-SW014-0211	3501997	350199701
WW06-SW015-0211	3501997	350199702
WW06-SW016-0211	3501997	350199703
WW06-SW017-0211	3501997	350199706
WW06-SW018-0211	3502004	350200405
WW06-SW019-0211	3502004	350200406
WW06-SW020-0211	3502004	350200407
WW06-SW021-0211	3502004	350200404
WW06-SW022-0211	3502004	350200403
WW06-SW023-0211	3502004	350200402
WW06-SW023P-0211	3502004	350200401

Client ID	SDG	Lab ID	DL	
VWW06-SD001-0211	3502004	416	1	
VWW06-SD002-0211	3502004	417	1	
VWW06-SD003-0211	3501993	301	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD004-0211	3501993	304	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD005-0211	3501993	305	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD006-0211	3501993	306	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD006P-0211	3501993	307	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD007-0211	3501993	308	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD008-0211	3501993	309	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD009-0211	3501993	310	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD010-0211	3501993	311	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD011-0211	3501993	312	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD011P-0211	3501993	313	10	Reanalye for Sb and Ag via SW-846 6010B at 1X-2X dilution.
VWW06-SD014-0211	3502004	412	1	
VWW06-SD015-0211	3502004	413	1	
VWW06-SD016-0211	3502004	414	1	
VWW06-SD017-0211	3502004	415	1	
VWW06-SD018-0211	3502037	707	1	
VWW06-SD018-0211MS	3502037	708	1	
VWW06-SD018-0211SD	3502037	709	1	
VWW06-SD019-0211	3502037	706	1	
VWW06-SD020-0211	3502037	705	1	
VWW06-SD021-0211	3502037	704	1	
VWW06-SD022-0211	3502037	703	1	
VWW06-SD023-0211	3502037	701	1	
VWW06-SD023P-0211	3502037	702	1	

PEL

A Division of SPECTRUM ANALYTICAL, INC. Formerly HANNIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

3501993

Page 1 of 2

NB

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: Michael Zamboni / WDC
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
703-376-5711, michael.zamboni@ch2m.com
Project Mgr.: Bill Hamernik, VBO

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: 402422.F1.SW.06
Site Name: SWMU 6
Location: Vieques State: PR
Sampler(s): D. Ballam, J. Martin

1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8=$NaHSO_4$ 9=_____ 10=_____ 11=_____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	NB 2-7-11	Analyses: VOCs	PAHs	PEST/PCB	Metals	WCHEM	WCHEM (sulfur)	grain size	AUSSEM
-13	VWW06-SD011R-021	2/4/11	0735		SO	3		4			X	X	X	X				
-14	VWAE-EB01-020411	2/4/11	0630		AQ	3	5		6		X	X	X	X				
-15	VWAE-TB01-020411	2/4/11	0045		AQ	3					X							

QA/QC Reporting Level
☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____

State specific reporting standards: _____

☐ E-mail to _____
EDD Format _____

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

Relinquished by:	Received by:	Date:	Time:
		2-7-11	850

3502499 R1
027
49

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Wednesday, April 27, 2011 9:44 AM
To: 'Hillary.Ott@CH2M.com'
Cc: Michael.Zamboni@CH2M.com; Vickie.Weber@ch2m.com
Subject: Vieqeues SWMU 6 metals data revision for 3502499
Attachments: Vieques 3502499 6010.pdf; CAR00550.pdf

Hillary:

Good morning.

Per our telephone conversation today we will revise SDG 3502499 pdf report and EDD.

During data review it was observed that the default weights were posted for samples instead of the actual weight prepped for metals. This affected the proper calculations of sample results and MS/SD. PEL took immediate action and determined which SDGs were affected to reissue those reports.

I have attached the revised sample results, MS/SD results, and a copy of our Corrective Action Report which will be included in the revision.

We apologize for any inconvenience this may cause.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division, PEL
8405 Benjamin Road, Suite A
Tampa, FL 33634
813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

Client: CH2M Hill

WONo: 3502499 **Profile Name:** Vieques **Profile #:** 90619

MATRIX S

Sample #	Bottle	Parameter		Check	Received	Date
01	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:09 AM
01	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:23:07 AM
01	001	6010	Metals	In	Karen Michalski	4/8/2011 12:26:40 PM
02	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:10 AM
02	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:23:33 AM
02	001	6010	Metals	In	Karen Michalski	4/8/2011 12:26:04 PM
03	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:10 AM
03	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:23:27 AM
03	001	6010	Metals	In	Karen Michalski	4/8/2011 12:26:17 PM
04	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:11 AM
04	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:23:57 AM
04	001	6010	Metals	In	Karen Michalski	4/8/2011 12:26:30 PM
05	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:11 AM
05	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:24:06 AM
05	001	6010	Metals	In	Karen Michalski	4/8/2011 12:26:36 PM
06	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:11 AM
06	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:22:47 AM
06	001	6010	Metals	In	Karen Michalski	4/8/2011 12:26:00 PM
07	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:12 AM
07	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:23:41 AM
07	001	6010	Metals	In	Karen Michalski	4/8/2011 12:25:57 PM
08	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:12 AM
08	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:23:02 AM
08	001	6010	Metals	In	Karen Michalski	4/8/2011 12:26:13 PM
09	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:12 AM
09	001	6010	Metals	Out	Karen Michalski	4/8/2011 11:23:48 AM
09	001	6010	Metals	In	Karen Michalski	4/8/2011 12:25:55 PM
10	001	6010	Metals	In	Russell Stallone	4/8/2011 8:02:13 AM

Letter of Acceptance

Customer Name: CH2M Hill

Date and Time Received: 4/5/2011 1:35:00 PM

Date to be Reported: 4/19/2011

Laboratory Submission Number/SDG: 3502499

Get Detailed Analyte List here: www.pelab.com/webdms/Default.asp?LoaSDG=3502499

Project: Vieques SWMU 6/402244.F1.SW.06/CTO11

Samples: The submission consisted of 13 samples, including QC, with sample identification shown in the attached data tables.

Tests: The Samples will be analyzed for EPA methods: 6010.

Sample Custody/COC discrepancies:

None.

Notes:

Per client, samples relogged in for 6010 Sb and Ag analysis to run at 1x or 2x dilutions.

Distribution of Report to:

CH2M Hill
Attn: Michael Zamboni
(W): 703.376.5301

Note: Submitted material will be retained for 30 days unless otherwise requested by client or consumed in analysis. PEL letters and reports are for the exclusive use of the client to whom they are addressed. Our letters and reports apply to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar materials

Log-in Report

Level: 4

Total of: 26 analyses on 13 samples (including QC) *08-Apr-11*

Report/SDG #: 3502499

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD003-0211	350249901		S	2/4/2011 10:25:00 AM	4/5/2011 1:35:00 PM
Method					
6010	Metals			6010	
Dry Weight	Dry Weight			Dry Weight	
SampleID	**LAB ID**	**StationID**	**Matrix**	**SampleDate**	**ReceiveDate**
VWW06-SD003-0211MS	350249902		S	2/4/2011 10:25:00 AM	4/5/2011 1:35:00 PM
Method					
6010	Metals			6010	
Dry Weight	Dry Weight			Dry Weight	
SampleID	**LAB ID**	**StationID**	**Matrix**	**SampleDate**	**ReceiveDate**
VWW06-SD003-0211MSD	350249903		S	2/4/2011 10:25:00 AM	4/5/2011 1:35:00 PM
Method					
6010	Metals			6010	
Dry Weight	Dry Weight			Dry Weight	
SampleID	**LAB ID**	**StationID**	**Matrix**	**SampleDate**	**ReceiveDate**
VWW06-SD004-0211	350249904		S	2/4/2011 11:05:00 AM	4/5/2011 1:35:00 PM
Method					
6010	Metals			6010	
Dry Weight	Dry Weight			Dry Weight	
SampleID	**LAB ID**	**StationID**	**Matrix**	**SampleDate**	**ReceiveDate**
VWW06-SD005-0211	350249905		S	2/4/2011 9:30:00 AM	4/5/2011 1:35:00 PM
Method					
6010	Metals			6010	
Dry Weight	Dry Weight			Dry Weight	

Report/SDG #: 3502499

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD006-0211	350249906		S	2/4/2011 8:25:00 AM	4/5/2011 1:35:00 PM

Method			
6010	Metals		6010
Dry Weight	Dry Weight		Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD006P-0211	350249907		S	2/4/2011 8:25:00 AM	4/5/2011 1:35:00 PM

Method			
6010	Metals		6010
Dry Weight	Dry Weight		Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD007-0211	350249908		S	2/4/2011 9:00:00 AM	4/5/2011 1:35:00 PM

Method			
6010	Metals		6010
Dry Weight	Dry Weight		Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD008-0211	350249909		S	2/4/2011 10:00:00 AM	4/5/2011 1:35:00 PM

Method			
6010	Metals		6010
Dry Weight	Dry Weight		Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD009-0211	350249910		S	2/4/2011 9:45:00 AM	4/5/2011 1:35:00 PM

Method			
6010	Metals		6010
Dry Weight	Dry Weight		Dry Weight

Report/SDG #: 3502499

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD010-0211	350249911		S	2/4/2011 9:45:00 AM	4/5/2011 1:35:00 PM

Method		
6010	Metals	6010
Dry Weight	Dry Weight	Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD011-0211	350249912		S	2/4/2011 7:35:00 AM	4/5/2011 1:35:00 PM

Method		
6010	Metals	6010
Dry Weight	Dry Weight	Dry Weight

SampleID	LAB ID	StationID	Matrix	SampleDate	ReceiveDate
VWW06-SD011P-0211	350249913		S	2/4/2011 7:35:00 AM	4/5/2011 1:35:00 PM

Method		
6010	Metals	6010
Dry Weight	Dry Weight	Dry Weight

John Heyman [PEL]

From: Michael.Zamboni@CH2M.com
Sent: Tuesday, April 05, 2011 1:16 PM
To: John Heyman [PEL]
Cc: Michael.Zamboni@CH2M.com; Brett.Doerr@CH2M.com; Bill.Hannah@CH2M.com; Vickie.Weber@ch2m.com; Angela.Barch@ch2m.com
Subject: RE: SW/SD Metals at Navy CLEAN 1000-CTO-111 Vieques SWMU 6
Attachments: Vieques metals_r1_mjz.xls

Hi John,

Thank you so much for your patience and your assistance on this project! I have finally had a chance to sit down and examine the data set in detail. For the surface water samples, we are good to go with the action you already took. We already received the logins to re-report (existing runs) all surface waters for 6020 analytes Sb, As, Cd, Cr, Co, Cu, Pb, and Ag via SW-846 6010B. Not only is this absolutely needed, but it may still be too high-concentration along with other analytes already reported via 6010. Therefore, can you please comment on remaining volume for SW samples (designated for metals, filtered metals or unpreserved in various bottles) in case this is needed for specialty ultra-trace analysis without recollection?

For sediment samples, there are two slight changes of plan. First of all, as you pointed out, only some samples require reanalysis because many samples were already analyzed at 1X. Secondly, only a couple analytes are needed and not the full 6010/6020 list.

Please go ahead and reanalyze the 11 samples (for which D/F = 10) via SW-846 6010B at 1X-2X dilution. Please see attached. Only Sb and Ag are needed. Also, please toss in an MS/MSD if there isn't already one in the limited set of samples.

Thanks,
Mike Z.

From: John Heyman [PEL] [mailto:jheyman@pelab.com]
Sent: Wednesday, March 30, 2011 3:05 PM
To: Zamboni, Michael/WDC
Subject: FW: SW/SD Metals at Navy CLEAN 1000-CTO-111 Vieques SWMU 6

Mike:
We are proceeding with the water 6010 and 6010D reloads. We will also re-report the MS/SDs for VWW06-SW004-0211 and VWW06-SW016-0211. I hope to have this complete next week. I will have an LOA for you tomorrow.
Please let me know on the soils and we will get started on those.
Thanks!
John

From: John Heyman [PEL]
Sent: Monday, March 28, 2011 4:10 PM
To: 'Michael.Zamboni@CH2M.com'
Subject: FW: SW/SD Metals at Navy CLEAN 1000-CTO-111 Vieques SWMU 6

Mike:
Good afternoon.

Please see attached spreadsheet with the sample IDs from below with the lowest dilution factor reported. Sheet 1 soils and Sheet 2 waters.
I will go ahead and proceed with a new report for the waters with the 6020 list.
Please advise on which soils you would like rerun from your list in #1 below. I would imagine that you will only want the soils from 3501993 rerun, but let me know for sure.
Thanks!
John

From: John Heyman [PEL]
Sent: Friday, March 25, 2011 10:28 AM
To: 'Michael.Zamboni@CH2M.com'
Subject: FW: SW/SD Metals at Navy CLEAN 1000-CTO-111 Vieques SWMU 6

Mike:
I like to discuss the additional metals work for Vieques SWMU6. Let me know when I could give you a call today.
Thanks!
John

From: Michael.Zamboni@CH2M.com [mailto:Michael.Zamboni@CH2M.com]
Sent: Tuesday, March 15, 2011 4:14 PM
To: John Heyman [PEL]
Cc: Michael.Zamboni@CH2M.com; Brett.Doerr@CH2M.com; Bill.Hannah@CH2M.com; Vickie.Weber@ch2m.com
Subject: SW/SD Metals at Navy CLEAN 1000-CTO-111 Vieques SWMU 6

Hi John H.,

Per our recent discussions, we would like you to go back and do some additional work for Vieques SWMU 6. This additional work should help us achieve our DQOs (retain low reporting limits) where interference and high salt content have been causing dilutions.

1. For sediment samples, please reanalyze 6010/6020 Metals via SW-846 6010B (as per the UFP-SAP) at a 1X to 2X dilution. 6010/6020 metals include Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Se, Ag, Na, Tl, V, and Zn. We understand that internal standards should fail at this concentration range but we should be able to get usable results. You do not need to dilute further to get detects into range (greater dilutions were already provided). Please use the same Sample IDs but report these results in a separate SDG (the data package should be fully-validatable) and SNEDD. Affected samples are:

VWW06-SD001-0211
VWW06-SD002-0211
VWW06-SD003-0211
VWW06-SD004-0211
VWW06-SD005-0211
VWW06-SD006-0211
VWW06-SD006P-0211
VWW06-SD007-0211
VWW06-SD008-0211
VWW06-SD009-0211
VWW06-SD010-0211
VWW06-SD011-0211
VWW06-SD011P-0211
VWW06-SD014-0211
VWW06-SD015-0211

VWW06-SD016-0211
VWW06-SD017-0211
VWW06-SD018-0211
VWW06-SD018-0211MS
VWW06-SD018-0211SD
VWW06-SD019-0211
VWW06-SD020-0211
VWW06-SD021-0211
VWW06-SD022-0211
VWW06-SD023-0211
VWW06-SD023P-021

That should be all of them but let me know if you think I'm missing any samples. Are there other MS/MSDs in there? This comes to 24 billable samples at $45 per sample for an estimated not-to-exceed total of $1,080. Please invoice separately as nonPO. Here are billing instructions:

Original invoices should be submitted to:

CH2M HILL INC A/P
P.O. Box 241329
Denver, CO 80224

All invoices must include the following information in order to be processed for payment:

[Unique invoice number]
[Date]
[Remit to address]
Contract # N62470-08-D-1000
"no P.O. number"
Navy CLEAN 1000 CTO-111
"no Buyer"
CH2M HILL Project Manager: Bill Hannah/VBO
Project # 404422.FI.SW.S6

Invoices that do not have the above required information will be returned to the vendor.

Inquiries concerning payment status should be directed the Accounts Payable department at (303) 771-0952, EXT 62029 or at nerapcor@CH2M.com.

2. For surface water samples, please re-report 6020 metals (as per the UFP-SAP) via SW-846 6010B. No additional reanalysis is required and existing dilution factors are approximately 20X. 6020 metals include Sb, As, Cd, Cr, Co, Cu, Pb, and Ag. Do not re-report the 6010B metals where we already have results. In this case, there shouldn't be any internal standard failures because the samples were run at appropriate dilutions. However, we understand that there will be various other sporadic QA/QC failures because these were not "analytes of interest" via SW-846 6010B. Again, please use the same Sample IDs but report these results in a separate SDG (the data package should be fully-validatable) and SNEDD. Affected samples are:

VWW06-SW001-0211
VWW06-SW002-0211

VWW06-SW003-0211
VWW06-SW004-0211
VWW06-SW005-0211
VWW06-SW006-0211
VWW06-SW007-0211
VWW06-SW007P-0211
VWW06-SW014-0211
VWW06-SW015-0211
VWW06-SW016-0211
VWW06-SW017-0211
VWW06-SW018-0211
VWW06-SW019-0211
VWW06-SW020-0211
VWW06-SW021-0211
VWW06-SW022-0211
VWW06-SW023-0211
VWW06-SW023P-0211

These samples have both METAL and FMETAL fractions. That should be all of them but let me know if you think I am missing any samples. Were there any MS/MSDs in there? Also, I understand that there is no charge for re-reporting of 6020 analytes from existing 6010 analyses.

3. Please let me know when we can expect these results! Don't forget to hold on to our samples so we can do specialty analysis if necessary. Also, please let me know if anything appears out of the ordinary or if there is anything here which you were not expecting.

Thanks,
Mike Z.

Michael Zamboni
Chemist
Environmental Services

CH2M HILL
15010 Conference Center Drive; Suite 200
Chantilly, VA 20151
Direct 703.376.5301
Fax 703.376.5801
Mobile 571.212.9324
www.ch2m.com

John Heyman [PEL]

From: John Heyman [PEL]
Sent: Thursday, April 14, 2011 3:52 PM
To: Michael.Zamboni@CH2M.com
Subject: 3502499 / Vieques / 6010

Good afternoon.

Please note the following that will appear in the case narrative for method 6010 on SDG 3502499.

1. **Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

   A client requested MS/SD set was analyzed.
   All percent recovery and relative percent difference (RPD) criteria were met with the exception of:
   MS - VWW06-SD003-0211MS was analyzed with the soil samples on 04/14/11. The following analyte(s) were recovered below criteria: Antimony at 54.6 % with criteria of (80-120).

   SD - VWW06-SD003-0211MSD was analyzed with the soil samples on 04/14/11. The following analyte(s) were recovered below criteria: Antimony at 54.3 % with criteria of (80-120). The most probable cause for MS/MSD exceeding limits is samples matrix. The LCS/LCSD passed all quality control criteria. No further action was taken. Samples coded accordingly.

Please contact me with any questions or concerns.

Thanks!

John Heyman
Project Manager
Spectrum Analytical Featuring Hanibal Technology
Tampa Division
8405 Benjamin Road, Suite A
Tampa, FL 33634

813-888-9507 ext 228

Due to rising cost of rush shipments, Spectrum Analytical requests that you allow sufficient time for all kit requests, 3 days notice at a minimum. If you need an expedited kit request Spectrum Analytical will provide the kit but will require that you pay for the shipping. Spectrum Analytical will continue to pay for all shipping previously agreed to, given proper notification. Thank you for your understanding and cooperation.

This e-mail is intended for the named addressee(s) and may contain information that is confidential and proprietary. If this information is received by anyone other than the named addressee(s), the recipient(s) should immediately notify the sender by e-mail and promptly delete the transmitted material. In no event shall this material be read, used, stored, or retained by anyone other than the named addressee(s) without the express written consent of the sender or the named addressee(s).

	YES	NO	N/A
A.I.1 Contract Compliance Screening Report			
Present?	[ ]	___	✓
ACTION: If no, contact RSCC/PO.			
A.I.2 Record of Communication (from RSCC)			
Present?	[ ]	___	✓
ACTION: If no, request from the RSCC.			
A.1.3 Sampling Trip Report			
Present and complete?	[ ]	___	✓
ACTION: If no, contact RSCC/PO.			
A.I.4 Chain of Custody/Sample Traffic Report			
Present?	✓	___	___
Legible?	✓	___	___
Signature of sample custodian present?	✓	___	___
ACTION: If no, contact RSCC/WAM/PO.			
A.I.5 Cover Page			
Present?	✓	___	___
Is the Cover Page properly filled in and the verbatim signed by the lab manager or the manager's designee?	✓	___	___
Do the sample identification numbers on the Cover Page agree with sample Identification numbers on:			
(a) Traffic Report Sheet?	[ ]	___	✓

These samples are reanalyses at lower DF.

	YES	NO	N/A
(b) Form I's?	[✓]	___	___
Is the number of samples on the Cover Page the same as the number of samples on the Traffic Report sheet and the Regional Record of Communication (ROC) for the data Case?	[___]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact RSCC/PO for re-submittal of the corrected Cover Page from the laboratory.

A.1.6 **SDG Narrative, DC-1 & DC-2 Form**

Is the SDG Narrative present?	[✓]	___	___
Is Sample Log-In Sheet(Form DC-1) present and complete?	[___]	___	✓
Is Complete SDG Inventory Sheet(Form DC-2) present and complete?	[___]	___	✓

ACTION:
If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.

A.1.7 **Form I to XV**

A.1.7.1 Are all the Form I through Form XV labeled with:

Laboratory Name?	[✓]	___	___
Laboratory Code?	[___]	✓	___
RAS/Non-RAS Case No.?	[___]	___	✓
SDG No.?	[✓]	___	___

		YES	NO	N/A
	Contract No.?	[✓]	___	___

ACTION:
If no for any of the above, note under Contract Problem/Non-Compliance Section of the "Data Review Narrative" and contact PO for corrected Form(s) from the laboratory.

A.1.7.2 After comparing values on Forms I-IX against the raw data, do any computation/ transcription errors exceed 10% of the reported values on the Forms for:

(a) all analytes analyzed by ICP-AES?	___	[✓]	___
(b) all analytes analyzed by ICP-MS?	_	[___]	_✓
(c) Mercury?	✓	[_]	____
(d) Cyanide?	_	[_]	✓

ACTION:
If yes, prepare Telephone Record Log and contact CLP PO/TOPO for the corrected data from the laboratory.

A.1.8 Raw Data

Data shall not be validated without the hard/electronic copies of the associated raw data for samples and QC samples.

A.1.8.1 Digestion/Distillation Log

prep log present

Digestion Log for ICP-AES (Form XII)present?	✓	[___]	___ ___
Digestion Log for ICP-MS (Form XII) present?		[___]	___ ___ ✓
Digestion Log for mercury (Form XII) present?		[___]	___ ___ ✓
Distillation Log for cyanide (Form XII) present?	✓	[___]	___ ___

Are pH values for metals and

	YES	NO	N/A
cyanide reported for each aqueous sample?	[ ]	_	✓
Are percent solids calculations present for soils/sediments? (see original data pkg for %solids data)	[ ]	✓	_
Are preparation dates present on the sample preparation logs/bench sheets? (or prep. log)	[✓]	_	_

NOTE:
Digestion/Distillation log must include weights, volumes, and dilutions used to obtain the reported results.

A.1.8.2 Is the analytical instrument real-time printouts present for:

ICP-AES?	[✓]	_	_
ICP-MS?	[ ]	_	✓
Mercury?	[ ]	_	✓
Cyanide?	[ ]	_	✓

Are all laboratory bench sheets and instrument raw data printouts necessary to support all sample analyses and QC operations:

Legible?	[ ]	_	_
Properly labeled?	[ ]	_	_

Are all field samples, QC samples and field QC samples present on:

Digestion/Distillation log?	[ ]	_	_
Instrument Printouts?	[✓]	_	_

ACTION:
If no for any of the above questions in Section A.1.8.1 and Section A.1.8.2, write Telephone Record Log and contact TOPO/PO for re-submittal from the laboratory.

		YES	NO	N/A
A.1.9	**Technical Holding Times**: (Aqueous and soil samples) (Examine sample Traffic Reports and digestion/distillation logs to determine the holding time from the sample collection date to the sample preparation date.)			
A.1.9.1	Cyanide distillation(14 days)exceeded?	_	[_]	✓
	Mercury analysis(28 days) exceeded?	_	[_]	✓
	Other Metals analysis(180 days)exceeded?	_	[✓]	_

ACTION:
If yes, reject (R) and red-line non-detects and flag as estimated (J)results ≥ MDL even if sample(s) was preserved properly.

NOTE:
In addition to qualifying the data, a list of all samples and analytes which exceeded the holding times must be prepared. Report for each sample the number of days that were exceeded. (Subtract the sample collection date from the sample preparation date). Attach this list to the data review narrative.

A.1.9.2	Is pH of aqueous samples for:			
	Metals Analysis ≤ 2?	[_]	_	✓
	Cyanide Analysis ≥ 12?	[_]	_	✓

ACTION:
If no for any of the above, flag non-detects as "R" and detects as "J".

A.1.9.3	Is the cooler temperature ≤ 10 C°?	[✓]	_	_

ACTION:
If cooler temperature is >10 °C , flag non-detects as "UJ" and detects as "J".

Samples flagged JTUJ due to cooler temp > 4°C +/- 2°C for > 2 days.

A.1.10 **Final Data Correctness - Form I**

A.1.10.1 Are Form I's for all samples

	YES	NO	N/A
present and complete?	[✓]		

ACTION:
If no, prepare Telephone Record Log and contact CLP PO/TOPO for submittal from the laboratory.

A.1.10.2 Verify there are no calculation and transcription errors in the results reported on Form I's. Circle on each Form I all results that are incorrect.

Is the calculation error less than 10% of the correct result?	[✓]		
Are results on Form I's reported in correct units (ug/L for aqueous and ~~MG/KG~~ ug/Kg for soils)?	[✓]		
Are results on Form I'S reported by correct significant figures?	[✓]		
Are soil sample results on Form I's corrected for percent solids?	[✓]		
Are all "less than MDL" values reported by the ~~CRQLs~~ LODs and coded with "U"?	[✓]		
Are values less than the ~~CRQLs~~ LOQs but greater than or equal to the MDLs flagged with "J"?	[✓]		
Are appropriate contractual quality control and Method qualifiers used?	[✓]		

ACTION:
If no for any of the above questions, prepare Telephone Record Log, and contact CLP PO/TOPO for corrected data.

A.1.10.3 Do EPA sample identification numbers and the corresponding laboratory sample identification numbers match on the Cover Page, Form I's and in the raw data? [✓]

Was a brief physical description

CH2M HILL VIEQUES CTO-111

SDG 3502499 R1

METALS CALCULATIONS

ICP - AES	
SAMPLE ID	VWW06-SD003-0211
ANALYTE	antimony
Lab Value CONCENTRATION (ug/Kg)	3190
AMOUNT FROM RAW DATA (ug/L)	21.9
SAMPLE SIZE (g)	0.66
FINAL VOLUME (L)	50
DILUTION FACTOR	1
DRYNESS FACTOR	0.52
CONVERSION FACTOR (g TO Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	3191

FIMS	
SAMPLE ID	
ANALYTE	
Lab Value CONCENTRATION (ug/Kg)	
AMOUNT FROM RAW DATA (ug/L)	
SAMPLE SIZE (g)	
FINAL VOLUME (L)	
DILUTION FACTOR	
DRYNESS FACTOR	
CONVERSION FACTOR (g TO Kg)	
CALCULATED CONCENTRATION (ug/Kg)	#DIV/0!

ICP-MS	
SAMPLE ID	
ANALYTE	
Lab Value CONCENTRATION (mg/Kg)	
AMOUNT FROM RAW DATA (ug/L)	
SAMPLE SIZE (g)	
FINAL VOLUME (L)	
DILUTION FACTOR	
DRYNESS FACTOR	
CONVERSION FACTOR (ug/g to mg/Kg)	
CALCULATED CONCENTRATION (ug/Kg)	#DIV/0!

	YES	NO	N/A
of the samples before and after digestion given on the Form I's?	[___]	✓	
Was any sample result outside the mercury/cyanide calibration range or the ICP-AES/ICP-MS linear range diluted and noted on the Form I?	[___]	✓	

ACTION:
If no for any of the above, note under the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.11 **Initial Calibration**

A.1.11.1	Is a record of at least 2 point (A blank and a standard)calibration present for ICP-AES analysis?	[___]	✓	
	Is a record of at least 2 point (a blank and a standard)calibration present for ICP-MS analysis?	[___]		✓
	Is a record of at least 5 point calibration (a blank & 4 standards)present for Hg analysis?	[___]		✓
	Is a record of at least 4 point calibration (a blank & 4 standards)present for cyanide?	[___]		✓

ACTION:
If incomplete or no initial calibration was performed, reject (R) and red-line the associated data (detects & non-detects).

	Is one initial calibration standard at the CRQL level for cyanide and mercury?	[___]		✓

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the Data Review Narrative.

A.1.11.2 Is the curve correlation coefficient $\geq$ 0.995 for:

		YES	NO	N/A
	Mercury Analysis?	[___]	___	✓
	Cyanide Analysis?	[___]	___	✓
	ICP-AES (more than 2 point Calib.)?	[___]	___	✓
	ICP-MS (more than 2 point calib.)?	[___]	___	✓

ACTION:
If no, qualify the associated sample results ≥ MDL as estimated "J" and non-detects as "UJ".

NOTE:
The correlation coefficient shall be calculated by the data validator using standard concentrations and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.12 **Initial and Continuing Calibration Verification- Form IIA**

A.1.12.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for ICP-AES and ICP-MS when both these methods were used for the same analyte?	[___]	___	___

ACTION:
If no for any of the above, prepare a Telephone Record Log and contact PO/TOPO for re-submittal from the laboratory.

A.1.12.2	Was a Continuing Calibration Verification performed every 10 samples or every 2 hours whichever is more frequent?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative.

A.1.12.3	Was an ICV or a mid-range standard distilled and analyzed with each batch of cyanide samples?	[___]	___	✓

	YES	NO	N/A

ACTION:
If no for any of the above, write in the Contract-Problem/Non-Compliance Section of the Data Review Narrative and qualify results ≥ MDL as estimated (J).

A.1.12.2 Circle on each Form IIA all percent recoveries that are outside the contract windows.

Are ICV/CCVs within control limits for:

Metals - 90-110%R?	[✓]	___	___
Hg - 80-120%R?	[___]	___	✓
Cyanide - 85-115%R?	[___]	___	✓

ACTION:
If no, qualify all samples between a previous technically acceptable CCV standard and a subsequent technically acceptable CCV standard as follows as follows:

Qualify as estimated (J) all detects and non-detects, if the ICV/CCV %R is between 75-89%(65-79% for Hg; 70-84% for CN). Qualify only positive results(≥ MDL) as "J" if the ICV/CCV %R is between 111-125%(121-135% for Hg;116-130% for CN). Reject (R) and red-line only
detects if the recovery is greater than 125% (135% for Hg; 130% for CN). Reject (R) and red-line all associated results (hits and non-detects)if the recovery is less than 75%(65% for Hg;70% for CN).

NOTE:
For ICV that does not fall within the acceptance limits, qualify all samples reported from the analytical run.

A.1.12.3 Was the distilled ICV or mid-range standard for cyanide within acceptance limits (85-115%)? [___] ___ ✓

ACTION:
If no, Qualify all cyanide results ≥ MDL as "J".

A.1.13 **CRQL Standard Analysis - Form IIB**

A.1.13.1 For each ICP-AES run, was a CRI

	YES	NO	N/A
(CRQL or MDL when MDL > CRQL) standard analyzed? **(Note:CRI is not required for Al, Ba, Ca, Fe, Mg, Na and K.)**	[✓]	___	___
For each ICP-MS run, was a CRI (CRQL or MDL when MDL > CRQL) standard analyzed for each mass/isotope used for the analysis?	[✓]	___	___
For each mercury run, was a CRQL standard analyzed?	[___]	___	✓
For each cyanide run, was a CRQL standard analyzed?	[___]	___	✓

ACTION:
If no for any of the above, write this deficiency in the Contract Problems/ Non-Compliance Section of the Data Review Narrative, inform CLP PO and flag results in the affected ranges (detects <2xCRQL)as J and non-detects UJ.

The affected ranges are:
ICP-AES Analysis - *True Value ± CRQL
ICP-MS Analysis - *True Value ± CRQL
Mercury Analysis - *True Value ± CRQL
Cyanide Analysis - *True Value ± CRQL
*** True value of the CRQL Standard**

A.1.13.2 Was a CRQL standard analyzed after the ICV/ICB, before the final CCV/CCB and once every 20 analytical samples in the analytical run for each analysis? analyzed at the beginning of sequence only [___] ✓ ___

ACTION:
If no, write in the Contract Problem/ Non-Compliance Section of the "Data Review Narrative".

A.1.13.3 Circle on each Form IIB all percent recoveries that are outside the acceptance windows.

	YES	NO	N/A
Is the CRQL standard within control limits for:			
Metals(ICP-AES/ICP-MS)- 70 - 130%?	[✓]	___	___
Mercury- 70 - 130%?	[___]	___	✓
Cyanide - 70 - 130%?	[___]	___	✓

ACTION:
If no, flag detects <2xCRQL as "J" and non-detects as "UJ" if the CRQL standard recovery is between 50-69%. Flag(J) only detects <2xCRQL if the recovery is between 131% and ≤180%. If the recovery is less than 50%, reject(R) and red-line non-detects and detects < 2xCRQL, and flag (J) detects between 2xCRQL and ICV/CCV. Reject and red-line only detects <2xCRQL and flag (J)detects ≥ 2xCRQL but < ICV/CCV if the recovery is > 180%.

NOTE:
1. Qualify all field samples analyzed between a previous technically acceptable analysis of the CRQL standard and a subsequent acceptable analysis of the CRQL standard
2. Flag (J) or reject (R) only the final sample results on Form I's when **Sample raw data** are within the affected ranges and the CRQL standard is outside the acceptance windows.
3. The samples and the CRQL standard must be analyzed in the same analytical run.

A.1.14 Initial and Continuing Calibration Blanks - Form III

		YES	NO	N/A
A.1.14.1	Present and complete for all the instruments used for the metals and cyanide analyses?	[✓]	___	___
	Was an initial Calibration Blank analyzed after ICV?	[✓]	___	___
	Was a continuing Calibration Blank analyzed after every CCV and every 10 samples or every 2 hours, whichever is more frequent?	[✓]	___	___
	Were the ICB & CCB values ≥ MDL but < CRQL reported on Form III and flagged "J" by			

		YES	NO	N/A
	using MDLs from direct analysis(Preparation Method "NP1")? (Check Form III against the raw data)	[___]	___	✓

No + results were reported in CCBs.

ACTION:
If no, inform CLP PO/TOPO and make a note in the Contract-Problems/Non-Compliance Section of the "Data Review Narrative".

A.1.14.2 Circle with red pencil on each Form III all Calib. Blank values that are:

≥ MDL but ≤ CRQL

> CRQL

A.1.14.2.1	When MDL < CRQL, is any Calib. Blank value ≥ MDL but ≤ CRQL?	___	[✓]	4

ACTION:
If yes, change sample results ≥ MDL but ≤ CRQL to the CRQL with a "U". Do not qualify non-detects.

X2 corr JAC 5/11

A.1.14.2.2	When MDL < CRQL, is any Calib. Blank value > CRQL?	___	[✓]	4

ACTION:
If yes, reject (R) and red line the associated sample results > CRQL but <ICB/CCB Blank Result. Flag as "J" detects > ICB/CCB blank value but < 10xICB/CCB value. Change the sample results ≥ MDL but ≤ the CRQL to CRQL with a "U".

A.1.14.2.3	Is any Calibration Blank value below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated all associated sample results ≥ CRQL but <10xCRQL.

NOTE:

1. For ICB that does not meet the technical QC Criteria, apply the action to all samples

	YES	NO	N/A

reported from the analytical run.

2. For CCBs that do not meet the technical QC criteria, apply the action to all samples analyzed between a previous technically acceptable analysis of CCB and a subsequent technically acceptable analysis of the CCB in the analytical run.,

A.1.15 **Preparation Blank - FORM III**

NOTE: The Preparation Blank for mercury is the same as the calibration blank.

A.1.15.1 Was one Preparation Blank prepared with and analyzed for:

Each Sample Delivery Group (SDG)?	[✓]	___	___
Each batch of the SDG samples digested/distilled?	[✓]	___	___
Each matrix type?	[✓]	___	___
All instruments used for metals and cyanide analyses?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the associated positive data <10xMDL for which the Preparation Blank was not analyzed.

NOTE:
If only one blank was analyzed for more than 20 samples, then the first 20 samples analyzed are not estimated(J),but all additional samples must be qualified (J).

A.1.15.2 Circle with red pencil on each Form III all Prep. Blank values that are:

≥ MDL but ≤ CRQL, and

> CRQL

A.1.15.2.1 When MDL < CRQL, is any preparation blank value ≥ MDL but ≤ CRQL?	___	[✓]	___

ACTION:
If yes, change sample result ≥ MDL

		YES	NO	N/A
	but ≤ CRQL to CRQL with a "U".			
A.1.15.2.2	When the MDL ≤ CRQL, is any Preparation Blank value greater than its CRQL?	___	[✓]	___
	If yes, is the Prep. Blank value greater than the value of the associated Field Blank collected and analyzed with the SDG samples?	___	[___]	✓
	If yes, is the lowest concentration of that analyte in the associated samples less than 10 times the Preparation Blank value?	___	[___]	✓

ACTION:
If yes, reject (R) and red-line all associated sample results greater than the CRQL but less than the Prep.Blank value. Flag as "J" detects > Prep. Blank value but <10xPrep.Blank. If the sample result ≥ MDL but ≤ CRQL, replace it with CRQL-U.

If the Prep. Blank value is less than the same analyte value in the Field Blank, do not qualify the sample results due to the Prep. Blank criteria.

NOTE:
Convert soil sample result to mg/Kg on wet weight basis to compare with the soil Prep. Blank result on Form III.

A.1.15.2.3	Is the Prep. Blank concentration below the negative CRQL?	___	[✓]	___

ACTION:
If yes, flag (J) all associated sample results less than 10xCRQL. Qualify non-detects as estimated (UJ).

A.1.15.2.4	When the MDL is greater than the CRQL, is the preparation blank concentration on Form III greater than two times the MDL?	___	[✓]	___

ACTION:

		YES	NO	N/A
	If yes, reject (R) and red-line all positive sample results with sample raw data less than 10 times the Preparation Blank value.			
A.1.16	**ICP-AES/ICP-MS Interference Check Sample (ICS)- Form IV** **NOTE:** Not required for CN, Hg, Al, Ca, Fe and Mg.			
A.1.16.1	Present and complete?	[✓]		
	Was ICS analyzed at the beginning and end of each analytical run, and once for every 20 analytical samples?	[✓]		
	Was ICS analyzed at the beginning of the ICP-MS analytical run?	[ ]		✓
	ACTION: If no, flag as estimated (J) all sample results.			
A.1.16.2	**ICP-AES Method**			
A.1.16.2.1	**ICSA Solution:** For ICP-AES, are the ICSA "Found" analyte values within the control limits ± of CRQL of the true/established mean value?	[✓]		
	If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSA Solution on Form IV?	[ ]		✓
	ACTION: If yes, apply the following action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run: Flag (J) as estimated only sample results ≥MDL			

	YES	NO	N/A

for which the ICSA "Found' value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag non-detects as "UJ" and detects as "J".

A.1.16.2.3 **ICSAB Solution**

For ICP-AES, are all analyte results in ICSAB within the control limits of 80-120 of the true/established mean value? [✓] ___ ___

If no for any of the above, is the sample concentration of Al, Ca, Fe, or Mg in the same units (ug/L or MG/KG) greater than or equal to its respective concentration in the ICSAB Solution on Form IV? [___] ___ ✓

ACTION:

If yes, apply the followirg action to all samples analyzed between a previous technically acceptable analysis of the ICS and a subsequent technically acceptable analysis of the ICS in the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79%, qualify sample results ≥ MDL as "J" and non-detects as "UJ". Reject (R) and red-line all sample results (detects & non-detects) for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only positive results.

A.1.16.3 **ICP-MS Method**

A.1.16.3.1 **ICSA Solution:**

For ICP-MS, are the ICSA "Found" analyte values within the control limits of ±CRQL of the true/established mean value? [___] ___ ✓

ACTION:

If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated only sample results ≥ MDL if the ICSA "Found" value is greater than (True value+CRQL). Do not qualify non-detects. If the ICSA "Found" value is less than (True value-CRQL), flag the associated sample detects as "J" and non-detects as "UJ".

055

	YES	NO	N/A

A.1.16.3.3 **ICSAB Solution**

For ICP-MS, are all analyte results in ICSAB within the control limits of 80-120% of the true/established mean value, whichever is greater? [___] ___ ✓

ACTION:
If no, apply the following action to all samples reported from the analytical run:

Flag (J) as estimated those associated sample results ≥ MDL for which the ICSAB analyte recovery is greater than 120% but ≤ 150%. If the ICSAB recovery falls within 50-79% flag (J) as estimated the associated sample results ≥ MDL. Reject (R) and red-line those all sample detects and non-detects for which the ICSAB analyte recovery is less than 50%. If the recovery is above 150%, reject (R) and red-line only detects (≥ MDL).

A.1.17 **Spiked Sample Recovery: Pre-Digestion/Pre-Distillation)-Form V A**
Note: Not required for Ca, Mg, K, and Na (both matrices); Al and Fe (soil only)

A.1.17.1 Was Matrix Spike analysis performed:

For each matrix type?	[✓]	___	___
For each SDG?	[___]	___	___
On one of the SDG samples?	[___]	___	___
For each concentration range (i.e., low, med., high)?	[___]	___	___
For each analytical Method (ICP-AES, ICP-MS, Hg, CN) used?	[___]	___	___
Was a spiked sample prepared and analyzed with the SDG samples?	[✓]	___	___

ACTION:
If no for any of the above, flag as estimated (J) all the positive data for which a spiked sample was not analyzed.

NOTE:
If more than one spiked sample were analyzed for one SDG, then qualify the associated data based on the worst spiked sample analysis.

		YES	NO	N/A
A.1.17.2	Was a field blank or PE sample used for the spiked sample analysis?	___	[✓]	___

ACTION:
If yes, flag (J) as estimated positive data of the associated SDG samples for which field blank or PE sample was used for the spiked sample analysis.

A.1.17.3	Circle on each Form VA all spike recoveries that are outside the control limits (75-125%) that have sample concentrations less than four times the added spike concentrations.			
	Are all recoveries within the control limits when sample concentrations are less than or equal to four times the spike concentrations?	[___]	✓	___

NOTE:
Disregard the out of control spike recoveries for analytes whose concentrations are greater than or equal to four times the spike added.

	Are results outside the control limits (75-125%) flagged with Lab Qualifier "N" on Form I's and Form VA?	[✓]	___	___

ACTION:
If no for any of the above, write in the Contract - Problems/Non-Compliance Section of the Data Review Narrative.

A.1.17.4 **Aqueous**

Are any spike recoveries:

(a) less than 30%?	___	[___]	✓
(b) between 30-74%?	___	[___]	___
(c) between 126-150%?	___	[___]	___
(d) greater than 150%?	___	[___]	___

ACTION:
If the matrix spike recovery is less than 30%, reject (R) and red-line all associated aqueous data (detects & non-detects). If between 30-74%, qualify all associated aqueous data ≥ MDL as "J" and non-detects

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SD003-0211MS

Lab Name: PEL, Spectrum Analytical Contract: Vieques SWMU 6/402244.F

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 52

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	80 - 120	43300		3190		73400	54.6	N	P
Silver	75 - 120	30800		295	J	29400	103.8		P

JLW

JC 51611

Comments:

270411 1718

058

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA Sample No.

VWW06-SD003-0211MSD

Lab Name: PEL, Spectrum Analytical Contract: Vieques SWMU 6/402244.F1

Lab Code : PEL Case No.: _____ SAS No: _____ SDG No.: 3502499

Matrix: SOIL Level:(low/med) LOW

% Solids for Sample: 52

Concentration Units (mg/L or mg/kg): UG/KG

Analyte	Control Limit %R	Spiked Sample	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	80 - 120	40000		3190		68200	54	N	P
Silver	75 - 120	28800		295	J	27300	~~104.4~~		P

JMJ

DC 5/6/11

Comments:

270411 1718

059

	YES	NO	N/A

as "UJ". If between 126-150%, flag (J) all data ≥ MDL as "J". If greater than 150%, reject (R) and red-line all associated data ≥ MDL.

(**NOTE**:Replace "N" with "J", "R" as appropriate.)

A.1.17.5 **Soil/Sediment**

Are any spike recoveries:

	YES	NO	N/A
(a) less than 10%?	✓	[✓]	
(b) between 10-74%?	✓	[ ]	
(c) between 126-200%?		[✓]	
(d) greater than 200%? ✓		[✓]	

ACTION:
If yes for any of the above, proceed as follows:

If the matrix spike recovery is less than 10%, reject (R) and red-line all associated data (detects & non-detects); if between 10-74%, qualify all associated data ≥ MDL as "J" and non-detects as "UJ"; if between 126-200%, flag (J) all associated data ≥ MDL as "J" If greater than 200%, reject (R) and red-line all associated data ≥ MDL.
(**NOTE**:Replace "N" with "J" or "R" as appropriate.)

A.1.18 **Lab Duplicates) - Form VI**

A.1.18.1 Was the lab duplicate analysis performed:

	YES	NO	N/A
For each SDG?	[✓]		
On one of the SDG samples?	[✓]		
For each matrix type?	[✓]		
For each concentration range (low or med.)?	[✓]		
For each analytical Method (ICP-AES/ICP-MS, Hg, CN) Used?	[✓]		
Was a lab duplicate prepared and analyzed with the SDG samples?	[✓]		

		YES	NO	N/A
	ACTION: If no for any of the above, flag (J) as estimated all the SDG sample results (detects & non-detects) for which the lab duplicate analysis was not performed.			
	NOTE: If more than one lab duplicate sample were analyzed for an SDG, then qualify the associated samples based on the worst lab duplicate analysis.			
A.1.18.2	Was a Field Blank or PE sample used for the Lab Duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) all SDG sample results (hits & non-detects) for which Field Blank or PE sample was used for duplicate analysis.			
A.1.18.3	Circle on each Form VI all values that are: RPD > 20%, or Absolute Difference > CRQL			
	Are all values within control limits (RPD ≤ 20% or absolute difference ≤ ±CRQL)?	[✓]	___	___
	If no, are all results outside the control limits flagged with an "*" (Lab Qualifier) on Form VI and on all Form I's?	[___]	___	✓
	ACTION: If no, write in the Contract-Problems/ Non-Compliance Section of the Data Review Narrative.			
	NOTE: The laboratory is not required to report on Form VI the RPD when both values are non-detects.			
A.1.18.4	**Aqueous**			
A.1.18.4.1	When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),			

	YES	NO	N/A
is any RPD > 20% but < 100%?	___	[___]	✓
is any RPD ≥ 100%?	___	[___]	___

ACTION:
If the RPD is > 20% but < 100%, flag (J) as estimated the associated sample data ≥ CRQL. If the RPD is ≥ 100%, reject (R) and red-line the associated sample data ≥ CRQL.

(**NOTE:** Replace "*" with "J" or "R" as appropriate.)

A.1.18.4.2 When the sample and/or duplicate value <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate values:

> ± CRQL?	___	[___]	✓
> ± 2xCRQL?	___	[___]	✓

ACTION:
If the absolute difference is > CRQL, flag as estimated all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 2xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but < 5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.18.5 **Soil/Sediment**

A.1.18.5.1 When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 35% but < 120%?	___	[✓]	___
is any RPD ≥ 120%?	___	[✓]	___

ACTION:
If the RPD is ≥ 35% and < 120%, flag (J) as estimated the associated sample

	YES	NO	N/A

data ≥ CRQL. If the RPD is ≥ 120%, reject (R)and red-line the associated sample data ≥ CRQL.

A.1.18.5.2 When the sample and/or duplicate value <5xCRQL(substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and duplicate:

> ± 2 x CRQL?	___	[✓]	___
> ± 4 x CRQL	___	[___]	___

ACTION:
If the absolute difference is > 2 x CRQL, flag all the associated sample results ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the absolute difference is > 4xCRQL, reject (R) and red-line all the associated non-detects and detects ≥ MDL but <5xCRQL.

NOTE:
1. Replace "*" with "J", "UJ" or "R" as appropriate.)
2. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this difference to qualify sample results.

A.1.19 Field Duplicates

Aqueous Field Duplicates

A.1.19.1	Was an aqueous Field Duplicate pair collected and analyzed? (Check Sampling Trip Report)	[___]	✓	___

ACTION:
If yes, prepare a Form (Appendix A.4) for each aqueous Field Duplicate pair. Report the sample and Field Duplicate results on Appendix A.4 from their respective Form I's. Calculate and report RPD on Appendix A.4 when sample and its Field Duplicate values are both > 5xCRQL. Calculate and report the absolute difference on Appendix A.4 when at least one value (sample or duplicate) is <5xCRQL. Evaluate the aqueous Field Duplicate analysis in accordance with the

	YES	NO	N/A

QC criteria stated in Sections A.1.19.2 and A.1.19.3.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and use this the criteria to qualify the results.

A.1.19.2 Circle all values on the Form (Appendix A.4) for Field Duplicates that have:

RPD ≥ 20% or

Difference > ± CRQL

When sample and duplicate values are both ≥5xCRQL (substitute MDL for CRQL when MDL > CRQL),

is any RPD ≥ 20%?	___	[___]	✓ ___
is any RPD ≥ 100%?	___	[___]	___

ACTION:
If the RPD is >20% but < 100%, flag (J) only the associated sample and its Field Duplicate results ≥ CRQL. If the RPD is ≥ 100%, reject(R) and red-line only the associated sample and its Field Duplicate result ≥ CRQL.

A.1.19.3 When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL >CRQL), is the absolute difference between sample and duplicate:

> ± CRQL?	___	[___]	✓ ___
> ± 2 x CRQL?	___	[___]	✓ ___

ACTION:
If the absolute difference is > CRQL, flag detects ≥ MDL but < 5xCRQL as "J" and non-detects as "UJ". If the difference is > 2xCRQL, reject (R) and red-line non-detects

		YES	NO	N/A

and results ≥ MDL but <5xCRQL of the sample and its Field Duplicate.

Soil/Sediment Field Duplicates

A.1.19.4 Was a soil field duplicate pair collected and analyzed? (Check Sampling Trip Report) [✓] ___ ___

ACTION:
If yes, for each soil Field Duplicate pair proceed as follows:

Prepare Appendix A.4 for each Field Duplicate pair. Report on Appendix A.4 all sample and its Field Duplicate results in MG/KG from their respective Form I's. Calculate and report RPD when sample and its duplicate values are both greater than 5xCRQL. Calculate and report the absolute difference when at least one value (sample or duplicate) is < 5xCRQL. Evaluate the Field Duplicate analysis in accordance with the QC Criteria stated in Sections A.1.19.5 and A.1.19.6.

NOTE:
1. Do not transfer "*" from Form I's to Appendix A.4.
2. Do not calculate RPD when both values are non-detects.
3. Substitute MDL for CRQL when MDL > CRQL.
4. If one value is >CRQL and the other value is non-detect, calculate the absolute difference between the value > CRQL and the MDL, and apply the criteria to qualify the results.

A.1.19.5 Circle on each Appendix A.4 all values that have:

RPD ≥ 35%, or Difference > ± 2xCRQL When sample and duplicate values are both ≥ 5xCRQL (substitute MDL for CRQL when MDL > CRQL),

XICorr JAC 5/7/11

is any RPD ≥ 35% but < 120%? ✓ [✗] ___

is any RPD ≥ 120%? ___ [✓] ___

ACTION:
If the RPD is ≥ 35% but < 120%,

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD006-0211
Duplicate Sample ID: VWW06-SD006P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
antimony	1720	3040	55
silver			#DIV/0!

COMMENTS: 30% RPD limit for all analytes >5X LOD; +/- 2X LOD if <5X LOD - J flag
120% RPD limit or +/- 4X LOD limit for R flag.

Sample ID: VWW06-SD011-0211
Duplicate Sample ID: VWW06-SD011P-0211

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
antimony			#DIV/0!
silver			#DIV/0!

COMMENTS: 30% RPD limit for all analytes >5X LOD; +/- 2X LOD if <5X LOD - J flag
120% RPD limit or +/- 4X LOD limit for R flag.

		YES	NO	N/A
	flag only the associated sample and its Field Duplicate results ≥ CRQL as "J". If the RPD is ≥ 120%, reject (R) and red-line only the sample and its Field Duplicate results ≥ CRQL.			
A.1.19.6	When the sample and/or duplicate value(s) <5xCRQL (substitute MDL for CRQL when MDL > CRQL), is the absolute difference between sample and Field Duplicate:			
	> ± 2 x CRQL?	___	[✓]	___
	> ± 4 x CRQL?	___	[✓]	___

ACTION:
If the absolute difference is > 2xCRQL, flag Sample and its Field Duplicate resuts ≥ MDL but <5xCRQL as "J" and non-detects as "UJ". If the difference is >4xCRQL, reject(R) and red-line non-detects and detects ≥ MDL but <5xCRQL of the sample and its Field Duplicate.

A.1.20 **Laboratory Control Sample (LCS)- Form VII**

A.1.20.1	Was one LCS prepared and analyzed for:			
	Each SDG?	[✓]	___	___
	Each matrix type?	[ ]	___	___
	Each batch samples digested/distilled?	[ ]	___	___
	For each Method(ICP-AES,ICP-MS,Hg,CN) used?	[ ]	___	___
	Was an LCS prepared and analyzed with the samples?	[ ]	___	___

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO or TOPO for submittal of the LCS results. Flag (J) as estimated all the data for which an LCS was not analyzed.

NOTE:
If only one LCS was analyzed for

	YES	NO	N/A

more than 20 samples, then the first 20 samples analyzed are not flagged(J), but all additional samples must be qualified (J).

A.1.20.2 **Aqueous LCS**

Circle on each Form VII the LCS percent recoveries outside control limits 80-120%.

NOTE: 1.Use digested ICV as LCS for aqueous mercury
2.Use distilled ICV as LCS for aqueous cyanide

Is any LCS recovery:

Less than 50%?	___	[___]	___
Between 50% and 79%?	___	[___]	___
Between 121% and 150%?	___	[___]	___
Greater than 150%?	___	[___]	___

ACTION:
If the LCS recovery is less than 50%, reject (R) and red-line all associated sample data (detects & non-detects); for a recovery between 50-79%, flag detects as "J" all non-detects as "UJ". if the LCS recovery is between 121-150%, flag only detects as "J". if the recovery is greater than 150%, reject (R) and red-line all detects.

A.1.20.3 **Solid LCS**

If an analyte's MDL is equal to or greater than the true value of LCS, disregard the "Action" below for that analyte even though the LCS is out of control limits.

Is the LCS "Found" value greater than the Upper Control Limit reported on Form VII?	___	[✓]	___

ACTION:

		YES	NO	N/A
	If yes, flag (J) all the associated detects ≥ MDL as estimated (J).			
	Is the LCS "Found" value lower than the Lower Control Limit reported on Form VII?	___	[✓]	___
	ACTION: If yes, flag detects as "J" and non-dectes as "UJ".			

A.1.21 **ICP-AES/ICP-MS Serial Dilution - Form VIII**

NOTE: Serial dilution analysis is required only when the initial concentration is equal to or greater than 50 x MDL.

		YES	NO	N/A
A.1.21.1	Was a Serial Dilution analysis performed:			
	For each SDG?	[✓]	___	___
	On one of the SDG samples?	[___]	___	___
	For each matrix type?	[___]	___	___
	For each concentration range (low or med.)?	[___]	___	___
	Was a Serial Dilution sample analyzed with the SDG samples?	[___]	___	___
	ACTION: If no for any of the above, flag as estimated (J) detects ≥ MDL of all the SDG samples for which the ICP Serial Dilution Analysis was not performed.			
A.1.21.2	Was a Field Blank or PE sample used for the Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag as estimated (J) detects ≥ MDL of all the SDG samples			
A.1.21.3	Circle on Form VIII the Percent Differences (%D) between sample results and its dilution results that are outside the control limits ± 10%			

		YES	NO	N/A
	when initial concentrations ≥ 50 x MDLs.			
	Are results outside the control limits flagged with an "E"(Lab Qualifier) on Form VIII and all Form I's?	[___]	___	✓

ACTION:
If no, write in the Contract-Problem/ Non-Compliance Section of the Data Review Narrative.

A.1.21.4 Are any %D values:

> 10%?	___	[✓]	___
≥ 100%?	___	[✓]	___

ACTION:
If the Percent Difference (%D) is greater than 10%, flag (J) as estimated all associated samples whose **raw data** ≥ MDL; if the %D is ≥ 100%, reject (R) and red-line all associated samples with **raw data** ≥ MDL.

(**NOTE**:Replace "E" with "J" or "R" as appropriate.)

A.1.22 **Total/Dissolved or Inorganic/Total Analytes**

A.1.22.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s)?	___	[___]	✓
	Were any analyses performed for inorganic as well as total analytes on the same sample(s)?	___	[___]	✓

ACTION:
If yes, prepare a Form (Appendix A.5) to compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference on Appendix A.5 as a percent of the total analyte only when both of the following conditions are fulfilled:

(1) The dissolved(or inorganic)concentration is greater than total concentration, and
(2) greater than or equal to 5xMDL.

A.1.22.2	Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%?	___	[___]	✓

		YES	NO	N/A
A.1.22.3	Is any dissolved(or inorganic) concentration greater than its total concentration by more than 50%?	___	[___]	✓

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) and red-line both the values.

A.1.23 **Field Blank - Form I**
NOTE: Designate "Field Blank" as such on Form I

A.1.23.1	Was a Field/Rinsate Bank collected and analyzed with the SDG samples?	[✓]	___	___
	If yes, is any Field/Rinsate Blank absolute value of an analyte on Form I greater than its CRQL(or 2xMDL when MDL>CRQL)?	___	[___]	✓
	If yes, circle the Field Blank value on Form I that is greater than the CRQL, (or 2 x MDL when MDL > CRQL).	VWW06-EB01-020411		
	Is any Field Blank value greater than CRQL also greater than the Preparation Blank value?	___	[___]	✓
	If yes, is the Field Blank value (> CRQL and > the prep. blank value) already rejected due to other QC criteria?	[___]	___	✓

ACTION:
If the Field Blank value was not rejected, reject all associated sample data (except the Field Blank results) greater than the CRQL but less than the Field Blank value. Reject on Form I's the soil sample results whose raw values in ug/L in the instrument printout are greater than the CRQL but less than the Field Blank value in ug/L. Flag as "J" detects between the Field Blank value and 10xField Blank value. If the sample result > MDL but ≤ CRQL, replace it with CRQL-U.

Results for rinse blank for Sb & Ag were not provided for 6010B.

If the Field Blank value is less than the

		YES	NO	N/A
	Prep.Blank value, do not qualify the sample results due to the Field Blank criteria.			

NOTE:
1. Field Blank result previously rejected due to other criteria cannot be used to qualify field samples.
2. Do not use Rinsate Blank associated with soils to qualify water samples and vice versa.

A.1.24 **Verification of Instrumental Parameters - Form IX, XA, XB, XI**

A.1.24.1	Is verification report present for:			
	Method Detection Limits (Form IX-Annually)?	[✓]	___	___
	ICP-AES Interelement Correction Factors (Form XA & XB -Quarterly)?	[✓]	___	___
	ICP-AES & ICP-MS Linear Ranges (Form XI-Quarterly)?	[✓]	___	___

ACTION:
If no, contact CLP PO/TOPO for submittal from the laboratory.

A.1.24.2 **Method Detection Limits - Form IX**

A.1.24.2.1	Are MDLs present on Form IX for:			
	All the analytes?	[✓]	___	___
	All the instruments used?	[✓]	___	___
	Digested and undigested samples and Calib.Blanks?	[✓]	___	___
	ICP-AES and ICP-MS when both instruments are used for the same analyte?	[___]	___	✓

ACTION:
If no for any of the above, prepare Telephone Record Log and contact CLP PO/TOPO for submittal of the MDLs from the laboratory. Report to CLP PO and write in the Contract Problems/ Non-Compliance Section of the Data Review Narrative if the MDL concentration is not less than ½ CRQL.

		YES	NO	N/A
A.1.24.2.2	Is MDL greater than the CRQL for any analyte?	___	[✓]	___
	If yes, is the analyte concentration on Form I greater than 5 x MDL for the sample analyzed on the instrument whose MDL exceeds CRQL?	[___]	___	✓
	ACTION: If no, flag as estimated (J) all values less than five times MDL for the analyte whose MDL exceeds the CRQL.			
A.1.24.3	**Linear Ranges - Form XI**			
A.1.24.3.1	Was any sample result higher than the high linear range for ICP-AES or ICP-MS?	___	[✓]	___
	Was any sample result higher than the highest calibration standard for mercury or cyanide?	___	[___]	✓
	If yes for any of the above, was the sample diluted to obtain the result reported on Form I?	[___]	___	✓
	ACTION: If no, flag (J) as estimated the affected detects (≥ MDL) reported on Form I.			
A.1.25	**ICP-MS Tune Analysis - Form XIV**			
A.1.25.1	Was the ICP-MS instrument tuned prior to calibration?	[___]	___	✓
	ACTION: If no, reject (R) and red-line all sample data for which tuning was not performed.			
A.1.25.2	Was the tuning solution analyzed or scanned at least five times consecutively?	[___]	___	✓
	Were all the required isotopes spanning the analytical range present in the tuning solution?	[___]	___	✓
	Was the mass resolution within			

		YES	NO	N/A
	0.1 amu for each isotope in the tuning solution?	[___]	___	✓
	Was %RSD less than 5% for each isotope of each analyte in the tuning solution?	[___]	___	✓

ACTION:
If no for any of the above, qualify all results ≥ MDL associated with that Tune as estimated "J", and all non-detects associated with that Tune as "UJ".

A.1.26 **ICP-MS Internal Standards - Form XV**

A.1.26.1	Were the Internal Standards added to all the samples and all QC samples and calibration standards (except the Tuning Solution)?	[___]	___	✓
	Were all the target analyte masses bracketed by the masses of the five internal standards?	[___]	___	✓

ACTION:
If none of the Internal Standards was added to the samples, reject (R) and red-line all the associated sample data (detects & non-detects). If internal standards were used but did not cover all the analyte masses, reject (R) and red-line only the analyte results not bracketed by the internal standard masses.

A.1.26.2	Was the intensity of an Internal Standard in each sample within 60-125% of the intensity of the same Internal Standard in the calibration blank?	[___]	___	✓
	If no, was the original sample diluted two fold, Internal Standard added and the sample re-analyzed?	[___]	___	✓
	Was the %RI for the two fold diluted sample within the acceptance limits (60-125%)?	[___]	___	✓

ACTION:
If no for any of the above, flag detects as "J" and non-detects "UJ" of all the analytes with atomic masses between the

atomic mass of the internal standard lighter

074

than the affected internal standard, and the atomic mass of the internal standard heavier than the affected internal standard.

A.1.27 **Percent Solids of Sediments**

A.1.27.1 Are percent solids in sediment(s):

< 50%? ✓ [___] ___

ACTION:
If yes, qualify as estimated (J) all detects and non-detects of a sample that has percent solids less than 50%(i.e.,moisture content greater than 50%).

Flag SD009 J/UJ
%Solids 32.1%

NOTE:
Flag(J) only the sample results that were not previously flagged due to other QC criteria.

Inorganic Data Review Narrative

Case# _____ **Site:** _____ **Matrix: Soil** ____

SDG# _____ **Lab:** _____ **Water** ____

Sampling Team: _____ **Reviewer:** _____ **Other** _____

A.2.1 **Data Validation Flags:**
The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as **estimated**

R and Red-Line - A red-line drawn through a sample result indicates **unusable** value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results ≥ MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully **usable**.

A.2.2 **Laboratory Qualifiers:**
The CLP laboratory applies a contractual qualifier on all

DataQual

Environmental Services, LLC

CH2M HILL-VBO
15010 Conference Center Drive
Suite 200
Chantilly, VA 20151

May 4, 2012
CTO-113 - Vieques Island, Puerto Rico
SDG# G2B080439, Test America- West Sacramento
&1205028, Brooks Rand Labs

Dear Mr. Zamboni,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG #s G2B080439 & 1205028. The data validation was performed in accordance with the USEPA methods (1668A with 1668C limits & 1638M), lab SOPs, as well as the Region II SOP for the Validation of PCB Congeners by Isotope Dilution (Method 1668A with 1668C limits), Sept 2008) and the Region II SOP for the Evaluation of Metals Data (SOP HW-2 Revision 13, Sept. 2006), as it applies. The SWMU6 SAP, January 2012 and professional judgment were also employed in the assessment of the sample results. The Region II SOP for the trace metals analytes was used, but was modified as necessary to reflect the QC requirements of the trace metals method and the site SAP. Alternative worksheets were provided. All areas of concern were discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID 1	Lab ID 2	Matrix	PCBs by 1668A	Trace Metals by 1638M
VWW06-FS01-0112	G2B080439-001	1205028-01	tissue	X	X
VWW06-FS01P-0112	G2B080439-002	1205028-02	tissue	X	X
VWW06-FS02-0212	G2B080439-003	1205028-03	tissue	X	X
VWW06-FS03-0212	G2B080439-004	1205028-04	tissue	X	X
VWW06-FS04-0112	G2B080439-005	1205028-05	tissue	X	X
VWW06-FS05-0212	G2B080439-006	1205028-06	tissue	X	X
VWW06-FS05P-0212	G2B080439-007	1205028-07	tissue	X	X
VWW06-FS06-0112	G2B080439-008	1205028-08	tissue	X	X
VWW06-FS07-0112	G2B080439-009	1205028-09	tissue	X	X
VWW06-FS08-0212	G2B080439-010	1205028-10	tissue	X	X
VWW06-CRB01-0112	G2B080439-011	1205028-11	tissue	X	X
VWW06-CRB01P-0112	G2B080439-012	1205028-12	tissue	X	X
VWW06-CRB02-0112	G2B080439-013	1205028-13	tissue	X	X
VWW06-CRB03-0112	G2B080439-014	1205028-14	tissue	X	X
VWW06-CRB04-0112	G2B080439-015	1205028-15	tissue	X	X
VWW06-CRB05-0212	G2B080439-016	1205028-16	tissue	X	X
VWW06-CRB05P-0212	G2B080439-017	1205028-17	tissue	X	X
VWW06-CRB06-0112	G2B080439-018	1205028-18	tissue	X	X
VWW06-CRB07-0112	G2B080439-019	1205028-19	tissue	X	X
VWW06-CRB08-0112	G2B080439-020	1205028-20	tissue	X	X
HB-Fish	G2B080439-021	1205028-21	water	X	X
HB-Crab	G2B080439-022	1205028-22	water	X	X
VWW06-FS03-0212 MS	G2B080439-004MS	1205028-04MS	tissue	X	X
VWW06-FS03-0212 MSD	G2B080439-004MSD	1205028-04MSD	tissue	X	X

5830 Amberway Drive • St. Louis, MO 63128 • 314-330-1327 • Fax 314-849-6264

Sample ID	Lab ID 1	Lab ID 2	Matrix	PCBs by 1668A	Trace Metals by 1638M
VWW06-FS03-0212 LR		1205028-04LR	tissue		X
VWW06-FS07-0112 MS	G2B080439-009MS	1205028-09MS	tissue	X	X
VWW06-FS07-0112 MSD	G2B080439-009MSD	1205028-09MSD	tissue	X	X
VWW06-FS07-0212 LR		1205028-09LR	tissue		X
VWW06-CRB03-0112 MS	G2B080439-014MS	1205028-14MS	tissue	X	X
VWW06-CRB03-0112 MSD	G2B080439-014MSD	1205028-14MSD	tissue	X	X
VWW06-CRB03-0212 LR		1205028-14LR	tissue		X
VWW06-CRB07-0112 MS	G2B080439-019MS	1205028-19MS	tissue	X	X
VWW06-CRB07-0112 MSD	G2B080439-019MSD	1205028-19MSD	tissue	X	X
VWW06-CRB07-0212 LR		1205028-19LR	tissue		X

Lab 1: Test America – Sacramento
Lab 2: Brooks Rand Labs

The following quality control samples were provided with this SDG: sample VWW06-FS01P-0112-field duplicate of sample VWW06-FS01P-0112 and VWW06-CRB05P-0112-field duplicate of sample VWW06-CRB05-0112. There were no field or rinsate blanks submitted for analysis. Two sample homogenization blanks were prepared and analyzed with the samples.

The samples were evaluated based on the following criteria:

- Data Completeness
- Sample Condition *
- Technical Holding Times *
- HRGC/HRMS Tuning *
- ICP-MS Tuning *
- Window Defining Mixture *
- Initial/Continuing Calibrations *
- RRT Criteria *
- Second Source Calibrations *
- ICSA/ICSAB Standards *
- Isotopic Abundance Ratios
- Signal to Noise Ratios *
- Blanks
- Internal Standards *
- Recovery Standards *
- Laboratory Control Samples *
- Laboratory Duplicate RPDs
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates
- Identification/Quantitation *
- EMPC Results
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. Please note that when a compound or analyte is flagged due to blank contamination the BL qualifier code takes precedence over all other qualifier codes except a code that explains rejected data.

PCB Congeners by EPA Method 1668A

Laboratory blank contamination had an impact on some reported positive results.

Two of the four field duplicates exhibited results with RPDs >30% when the results are above the LOQ. These results are qualified as estimated in the field duplicate pairs only.

Many positive results were qualified as Q and are reported as estimated maximum possible concentrations (EMPC) values. These results are qualified as estimated.

Two samples were excluded in favor of results reported from the dilution analyses.

Congeners with E flags were excluded in favor of the results reported from the dilution analyses.

Trace Metals by EPA Method 1638

Two of the four laboratory duplicates exhibited high RPDs. The reported results in the native samples were qualified as estimated J.

One of the MS/MSD pairs exhibited non-compliant recoveries for zinc in both the MS and the MSD aliquots. Zinc was flagged as estimated J in the native sample.

Qualifications were required in one of the four field duplicate pairs.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for this data package. For the metals method 1638M, clarification of the laboratory SOP requirements for ICP-MS tuning was required as the DOD requirement of tuning prior to each analytical run was not performed. The laboratory did however, follow their SOP procedures, and all criteria were met. Also, quantitation calculation clarification was required as final preparation volumes were not included on the digestion records. All requested items were provided by the laboratory. Copies of the e-mail correspondence are included in the worksheets section of this report.

For the PCB congener method 1668A several items were required. In some cases summaries of QC data (S/N ratios & RRT summaries) were not provided by the laboratory because the laboratory stated that they did not have the ability to create those forms in their LIMS system. Therefore, the validator requested examples of how these checks were accomplished in the laboratory and a letter stating that these criteria were met. Both of these things were received. Other items that were requested were calculation examples, missing standards data and missing sample data. In most cases, requested items were received. Copies of email correspondence are included in the worksheets section of this report.

Technical Holding Times

According to chain of custody records, sampling was performed on 1/31/12 and 2/1/12 and samples were received at the laboratory on 2/8/12. All sample preparation and analysis were performed within Region II and/or method holding time requirements. Samples were received appropriately packed on dry ice and at acceptable temperatures.

Blanks

PCB Congeners by 1668A

The associated method blanks exhibited contamination as noted in the following table. Blank contamination flagging criteria was modified to fit more in line with the flagging recommendations from the NFG as this criterion fits the DOD requirements of the DL/LOD/LOQ reporting scheme better. For this project non-detect results were reported to the compound LOD. For this reason a 5 times the blank contamination rule was not used to flag the samples. Criteria used to flag the samples were as follows:

U at LOD — The sample result for the blank contaminant is less than the LOD but greater than the DL when the blank value is less than or greater than the LOD. The sample result for the blank contaminant is qualified as non-detect U at the LOD.

U The sample result for the blank contaminant is greater than the LOD but less than the blank value. The sample result for the blank contaminant is qualified as non-detect U.

J The sample result for the blank contaminant is greater than the LOD and greater than the blank contamination concentration but less than 10X the blank contamination concentration when the blank value is greater than the LOD. The sample result for the blank contaminant is qualified as estimated J.

The final criteria in the set is a professional judgment decision based on the fact that positive results for contaminant compounds may be biased high due to blank contamination that is above the compound LODs. Results that are greater than 10X the blank concentration are less likely to be affected to a great degree by the contamination. Homogenization blanks were assessed for impact to the field samples. There was no impact based on homogenization blank contamination. Differences in matrix and extraction procedure were taken in to consideration when criterion was applied.

Associated blanks exhibited contamination as noted in the following table. *Please note that only those compounds resulting in qualifications were noted in the following table. Also, the blank qualification code takes precedence over other qualification codes. So congeners flagged for other QC issues as well as blank contamination will have a MBL qualifier code as the final qualifier code.*

Blank ID	Compound	Concentration (pg/g)	Action Level
G2B140000-127B	PCB-18/30	1.4 CJQ	LOD with action as follows: *U at LOD if < LOD *U at value if >LOD but <blank conc. *J up to 10X conc. if >LOD and >blank conc.
	PCB 20/28	2.9 CJ (>LOD)	
	PCB 31	2.8 JQ (>LOD)	
	PCB 32	0.61 JQ	
	PCB 44/47/65	9.6 CJ (>LOD)	
	PCB 49/69	0.92 CJQ	
	PCB 52	3.3 J (>LOD)	
	PCB 61/70/74/76	3.7 CJ	
	PCB 95	3.1 J (>LOD)	
	PCB 110/115	2.9 CJ (>LOD)	
G2B160000-107B	PCB 17	1.1 J (>LOD)	
	PCB 18/30	2.2 CJQ (>LOD)	
	PCB 20/28	4.8 JQ (>LOD)	
	PCB 22	1.7 JQ (>LOD)	
	PCB 31	4.8 J (>LOD)	
	PCB 44/47/65	12 CJ (>LOD)	
	PCB 52	4.5 JQ (>LOD)	
	PCB 61/70/74/76	4.5 CJ (>LOD)	
	PCB 64	1.5 J (>LOD)	
	PCB 66	1.5 JQ (>LOD)	
	PCB 95	1.6 JQ (>LOD)	

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Q Code
VWW06-CRB05P-0212	PCB 17	U at LOD	MBL
VWW06-CRB03-0112, VWW06-CRB04-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 17	J	MBL
VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212	PCB 18/30	U at LOD	MBL
VWW06-CRB03-0112, VWW06-CRB04-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 18/30	J	MBL
VWW06-FS06-0112 DL, VWW06-CRB06-0112	PCB 20/28	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB08-0112	PCB 20/28	J	MBL
VWW06-CRB05P-0212	PCB 22	U at LOD	MBL
VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 22	J	MBL
VWW06-FS06-0112 DL	PCB 31	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 31	J	MBL
VWW06-FS07-0112	PCB 32	U at LOD	MBL
VWW06-FS06-0112 DL	PCB 44/47/65	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB08-0112	PCB 44/47/65	J	MBL
VWW06-FS06-0112 DL	PCB 49/69	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS06-0112 DL, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 52	J	MBL
VWW06-FS06-0112 DL	PCB 61/70/74/76	U at LOD	MBL
VWW06-CRB05-0212, VWW06-CRB05P-0212	PCB 61/70/74/76	J	MBL
VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 64	J	MBL
VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 66	J	MBL
VWW06-FS05-0112, VWW06-FS05P-0112, VWW06-FS06-0112 DL , VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112, VWW06-CRB08-0112	PCB 95	J	MBL
VWW06-FS06-0112 DL	PCB 110/115	J	MBL

Laboratory Duplicate RPDs

Trace Metals by EPA Method 1638

The analyte lead exhibited high RPDs in two of the lab dup pairs (VWW06-FS03-0212 & VWW06-FS07-0112) with RPDs of 36% & 68%, respectively. The laboratory notes that they believe this is due to a homogenization issue – therefore the lead results in these two samples were qualified as estimated J. Although it is possible that other samples were affected by homogenization issues, the other two lab duplicate pairs exhibited acceptable RPDs for the reported target analytes as did the four MS/MSD pairs. For this reason the validator did not flag all of the samples based on the two non-compliant lab duplicate RPDs. A summary of these non-compliances and affected samples are noted in the following table.

LD Sample ID	Analytes	Samples	RPD	Q Flag	Q Code
VWW06-FS03-0212	lead	native sample only	36	J	LD
VWW06-FS07-0212	lead	native sample only	68	J	LD

Matrix Spike Recoveries

Trace Metals by EPA Method 1638

One MS/MSD pair (VWW06-FS07-0112) exhibited high zinc recoveries. Zinc in the native sample was qualified as J and it should be noted that the reported result may be biased high. Other samples digested with this MS/MSD pair were not qualified based on this non-compliance because three other MS/MSD pairs exhibited acceptable (or low in one aliquot) zinc recoveries. A summary of this non-compliance and affected samples are noted in the following table. Please note that results were not qualified unless both recoveries were non-compliant.

MS/MSD	Analytes	Samples	%R	Q Flag	Q Code
VWW06-FS07-0112	zinc	native sample only	153/123	J	MSH

Field Duplicate

Four field duplicate pairs were submitted by the client. These pairs were assessed for reproducibility. A RPD criteria of 30% was applied to results that were >LOQ in both the field sample and the field duplicate. A table of results and calculated RPDs is included in the validation worksheets. Qualifications were required.

Trace Metals by EPA Method 1638

Sample VWW06-FS01-0112 and duplicate sample VWW06-FS01P-0112 did not exhibit comparable results for lead (55% RPD) and zinc (44% RPD); therefore results for these analytes were qualified as estimated J in the field duplicate pair only with a qualifier code of FD.

PCB Congeners by 1668A

Sample VWW06-FS01-0112 and duplicate sample VWW06-FS01P-0112 did not exhibit comparable results for PCB 123 (37.62% RPD) and PCB 164 (46.70% RPD); therefore results for these congeners were qualified as estimated J in the field duplicate pair only with a qualifier code of FD.

Sample VWW06-CRB01-0112 and duplicate sample VWW06-CRB01P-0112 did not exhibit comparable results for PCB 126 (41.86% RPD) and PCB 185 (43.04% RPD); therefore results for these congeners were qualified as estimated J in the field duplicate pair only with a qualifier code of FD.

Isotopic Abundance Ratios

PCB Congeners by 1668A

All congeners that did not meet the isotopic abundance ratio criteria (Q flagged by the laboratory) were qualified as estimated J with a qualifier code of EMPC.

Identification/Quantitation

Trace Metals by EPA Method 1638

Several results were flagged as B due to concentrations above the LOD but less than the LOQ. These results were qualified as estimated J. No qualifier code was required.

PCB Congeners by 1668A

For sample VWW06-FS03-0212, the laboratory analyzed an undiluted run, a 50X dilution and a complex dilution. The laboratory reported the 50X dilution and the complex dilution analysis. The 50X dilution exhibited one result above the calibration range and many high concentrations of other congeners as well as some issues with the ion abundance ratios in the recovery standards. Therefore, all results from the 50X dilution of this sample are excluded in favor of the results reported from the complex dilution analysis in an effort to minimize possible interferences. A DL qualifier code was applied.

For sample VWW06-FS06-0112, the laboratory analyzed an undiluted run and then a 5X dilution run, in an effort to minimize interferences evidenced by high internal standard recoveries in the undiluted run. All recoveries were acceptable in the 5X dilution run; therefore the undiluted analysis of this sample is excluded in favor of the results reported from the 5X dilution run. A DL qualifier code was applied.

In sample VWW06-CRB02-0112, two E-flagged results were excluded in favor of the results reported from the dilution analysis. A DL qualifier code was applied.

The laboratory flagged all positive results for co-eluting isomers with a C flag to indicate that the result is for co-eluting isomers. Since this is implicit in the congener parameter name the C flags were removed from the results with no additional qualifier required.

One congener in one sample was flagged with a G flag to indicate that the detection limits were raised based on interferences noted in the chromatography. This G flag was crossed out by the validator and no additional qualification was required because the detection limit was raised as appropriate.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

CH2M HILL
Vieques, PR, CTO-113- SWMU6
SDG#s G2B080439 & 1205028

Summary of Data Qualifications

PCB Congeners by EPA 1668A

Sample ID	Congener	Results	Q flag	Q Code
VWW06-CRB05P-0212	PCB 17	+ up to LOD	U at LOD	MBL
VWW06-CRB03-0112, VWW06-CRB04-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 17	+ up to action limit	J	MBL
VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212	PCB 18/30	+ up to LOD	U at LOD	MBL
VWW06-CRB03-0112, VWW06-CRB04-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 18/30	+ up to action limit	J	MBL
VWW06-FS06-0112 DL, VWW06-CRB06-0112	PCB 20/28	+ up to LOD	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB08-0112	PCB 20/28	+ up to action limit	J	MBL
VWW06-CRB05P-0212	PCB 22	+ up to LOD	U at LOD	MBL
VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 22	+ up to action limit	J	MBL
VWW06-FS06-0112 DL	PCB 31	+ up to LOD	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 31	+ up to action limit	J	MBL
VWW06-FS07-0112	PCB 32	+ up to LOD	U at LOD	MBL
VWW06-FS06-0112 DL	PCB 44/47/65	+ up to LOD	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB08-0112	PCB 44/47/65	+ up to action limit	J	MBL
VWW06-FS06-0112 DL	PCB 49/69	+ up to LOD	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS06-0112 DL, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 52	+ up to action limit	J	MBL
VWW06-FS06-0112 DL	PCB 61/70/74/76	+ up to LOD	U at LOD	MBL
VWW06-CRB05-0212, VWW06-CRB05P-0212	PCB 61/70/74/76	+ up to action limit	J	MBL
VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 64	+ up to action limit	J	MBL
VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 66	+ up to action limit	J	MBL
VWW06-FS05-0112, VWW06-FS05P-0112, VWW06-FS06-0112 DL , VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112, VWW06-CRB08-0112	PCB 95	+ up to action limit	J	MBL
VWW06-FS06-0112 DL	PCB 110/115	+ up to action limit	J	MBL
VWW06-FS01-0112, VWW06-FS01P-0112	PCB 123 PCB 164*	+	J	FD
VWW06-CRB01-0112, VWW06-CRB01P-0112	PCB 126 PCB 185	+	J	FD
VWW06-FS03-0212 50X DL	all congeners	+/-	exclude	DL
VWW06-FS06-0112 (undiluted run)	all congeners	+/-	exclude	DL
VWW06-CRB02-0112 (undiluted run)	E flagged results	+E	exclude	DL
all samples	Q flagged + results	+Q	J	EMPC

*note: PCB 164 in VWW06-FS01-0112 was flagged as J EMPC rather than J FD.

Trace Metals by EPA 1638M

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-FS03-0212, VWW06-FS07-0212	lead	+	J	LD
VWW06-FS07-0112	zinc	+	J	MSH
VWW06-FS01-0112, VWW06-FS01P-0112	lead zinc	+	J	FD
all samples	all analytes	+B	J	

CH2M HILL
Vieques, PR, CTO-113- SWMU6
SDG#s G2B080439 & 1205028

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U at LOD	The sample result for the blank contaminant is less than the LOD but greater than the DL when the blank value is less than or greater than the LOD. The sample result for the blank contaminant is qualified as non-detect U at the LOD.
U	The sample result for the blank contaminant is greater than the LOD but less than the blank value. The sample result for the blank contaminant is qualified as non-detect U.
J	The sample result for the blank contaminant is greater than the blank contamination concentration but less than the 10X the blank contamination concentration when the blank value is greater than the LOD. The sample result for the blank contaminant is qualified as estimated J.

These modifications are in place due to the client requirement of reporting non-detects to the LOD. Only field sample results less than the LOD will be negated due to blank contamination. These guidelines follow the recommendations of the NFG.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the DL but less than or equal to the LOD, result is reported as non-detect at the LOD.

Glossary of Qualification Flags and Abbreviations, continued

Inorganic Methods, continued

ICB/CCB/PB Action:

R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

General Abbreviations

RL/LOD	reporting limit
PQL	practical quantitation limit
IDL	instrument detection limit
DL/MDL	method detection limit
LOQ	quantitation limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.2	J ~~J Q~~ EMPC	0.20	20	pg/g
PCB-2	2.0 U	~~J Q~~	0.20	20	pg/g
PCB-3	0.89	J	0.20	20	pg/g
PCB-4	9.7	J	0.91	20	pg/g
PCB-5	9.9 U		1.0	20	pg/g
PCB-6	7.2	J	1.0	20	pg/g
PCB-7	9.9 U		0.96	20	pg/g
PCB-8	24		1.0	20	pg/g
PCB-9	9.9 U		1.1	20	pg/g
PCB-10	9.9 U		0.49	20	pg/g
PCB-11	16	J B	1.0	20	pg/g
PCB-12/13	20 U		1.0	40	pg/g
PCB-14	9.9 U		0.88	20	pg/g
PCB-15	9.9 U		0.81	20	pg/g
PCB-16	5.9	J	0.23	20	pg/g
PCB-17	9.3	J	0.19	20	pg/g
PCB-18/30	26	C J B	0.16	40	pg/g
PCB-19	9.8	J	0.27	20	pg/g
PCB-20/28	230	C B	0.34	40	pg/g
PCB-21/33	23	C J B	0.32	40	pg/g
PCB-22	31		0.35	20	pg/g
PCB-23	0.99 U		0.32	20	pg/g
PCB-24	0.99 U		0.14	20	pg/g
PCB-25	12	J	0.33	20	pg/g
PCB-26/29	34	C J	0.33	40	pg/g
PCB-27	3.5	J	0.14	20	pg/g
PCB-31	140	B	0.32	20	pg/g
PCB-32	23	B	0.13	20	pg/g
PCB-34	2.2	J ~~J Q~~ EMPC	0.33	20	pg/g
PCB-35	2.0 U		0.35	20	pg/g
PCB-36	15	J	0.31	20	pg/g
PCB-37	3.1	J B	0.28	20	pg/g
PCB-38	0.99 U		0.35	20	pg/g
PCB-39	0.99 U		0.32	20	pg/g
PCB-40/71	31	C J	0.25	40	pg/g
PCB-41	0.99 U		0.35	20	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	9.5	J	0.28	20	pg/g
PCB-43	0.99 U		0.31	20	pg/g
PCB-45	13	J	0.32	20	pg/g
PCB-46	3.3	J ~~J Q~~ EMPC	0.32	20	pg/g
PCB-44/47/65	420	~~C~~ B	0.25	60	pg/g
PCB-48	2.5	J ~~J Q~~ EMPC	0.27	20	pg/g
PCB-49/69	520	~~C~~ B	0.22	40	pg/g
PCB-50/53	43	~~C~~	0.26	40	pg/g
PCB-51	8.8	J	0.24	20	pg/g
PCB-52	1900	~~B~~	0.27	20	pg/g
PCB-54	3.2	J	0.15	20	pg/g
PCB-55	2.0 U		0.73	20	pg/g
PCB-56	37		0.75	20	pg/g
PCB-57	33		0.70	20	pg/g
PCB-58	0.99 U		0.70	20	pg/g
PCB-59/62/75	52	~~C J~~ J	0.20	60	pg/g
PCB-60	160		0.73	20	pg/g
PCB-61/70/74/76	2300	~~C~~ B	0.69	80	pg/g
PCB-63	57		0.63	20	pg/g
PCB-64	170		0.18	20	pg/g
PCB-66	1300		0.72	20	pg/g
PCB-67	13	J	0.67	20	pg/g
PCB-68	23		0.65	20	pg/g
PCB-72	28		0.68	20	pg/g
PCB-73	0.99 U		0.20	20	pg/g
PCB-77	15		0.62	2.0	pg/g
PCB-78	0.99 U		0.76	20	pg/g
PCB-79	19	J	0.65	20	pg/g
PCB-80	0.99 U		0.63	20	pg/g
PCB-81	0.99 U		0.61	2.0	pg/g
PCB-82	16	J	1.8	20	pg/g
PCB-83	1.5 U		1.5	20	pg/g
PCB-84	97		1.7	20	pg/g
PCB-85/116/117	930	~~C~~	1.2	60	pg/g
PCB-86/87/97/108/119/125	710	~~C~~	1.3	120	pg/g
PCB-88/91	180	~~C~~	1.5	40	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	**Work Order #....:**	MQN741AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.01 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	1.6 U		1.6	20	pg/g
PCB-90/101/113	3800	C B	1.3	60	pg/g
PCB-92	880		1.6	20	pg/g
PCB-93/100	27	C J	1.4	40	pg/g
PCB-94	1.6 U		1.6	20	pg/g
PCB-95	780	B	1.5	20	pg/g
PCB-96	3.3	J	0.11	20	pg/g
PCB-98/102	2.2	J C J Q E,nPC	1.5	40	pg/g
PCB-103	27		1.4	20	pg/g
PCB-104	0.99 U		0.13	20	pg/g
PCB-106	2.0 U		1.4	20	pg/g
PCB-109	550		0.92	20	pg/g
PCB-107/124	210	C	1.2	40	pg/g
PCB-110/115	1200	C B	1.2	40	pg/g
PCB-111	6.5	J	1.1	20	pg/g
PCB-112	1.4 U		1.4	20	pg/g
PCB-114	170		1.1	2.0	pg/g
PCB-120	42		1.1	20	pg/g
PCB-121	2.7	J	1.1	20	pg/g
PCB-122	1.2 U		1.2	20	pg/g
PCB-123	82	J FD	1.1	2.0	pg/g
PCB-126	26		1.3	2.0	pg/g
PCB-127	13	J	1.2	20	pg/g
PCB-128/166	990	C	0.35	40	pg/g
PCB-130	320		0.47	20	pg/g
PCB-131	3.9	J	0.44	20	pg/g
PCB-132	120		0.44	20	pg/g
PCB-133	63		0.43	20	pg/g
PCB-134/143	14	C J	0.47	40	pg/g
PCB-135/151	320	C	0.40	40	pg/g
PCB-136	48		0.31	20	pg/g
PCB-137	240		0.31	20	pg/g
PCB-139/140	100	C	0.38	40	pg/g
PCB-141	580		0.50	20	pg/g
PCB-142	0.99 U		0.51	20	pg/g
PCB-144	76		0.39	20	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

4512

016

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-145	0.99 U		0.30	20	pg/g
PCB-146	960		0.31	20	pg/g
PCB-147/149	390	C	0.38	40	pg/g
PCB-148	4.2	J	0.39	20	pg/g
PCB-150	1.0	J ~~J Q~~ EMPC	0.29	20	pg/g
PCB-152	0.99 U		0.28	20	pg/g
PCB-154	61		0.37	20	pg/g
PCB-155	1.8	J ~~J Q~~ EMPC	0.37	20	pg/g
PCB-156/157	1500	C	1.3	4.0	pg/g
PCB-158	790		0.31	20	pg/g
PCB-159	1.2 U		1.2	20	pg/g
PCB-160	0.99 U		0.39	20	pg/g
PCB-161	0.99 U		0.39	20	pg/g
PCB-162	58		1.2	20	pg/g
PCB-164	87	J ~~Q EMPC~~	0.40 EMPC	20	pg/g
PCB-165	0.99 U		0.33	20	pg/g
PCB-167	500		0.98	2.0	pg/g
PCB-169	1.3 U		1.3	2.0	pg/g
PCB-170	1000		0.88	20	pg/g
PCB-171/173	300	C	0.90	40	pg/g
PCB-172	190		0.84	20	pg/g
PCB-174	49		1.0	20	pg/g
PCB-175	20	J	0.15	20	pg/g
PCB-176	5.1	J	0.11	20	pg/g
PCB-177	280		0.87	20	pg/g
PCB-178	56		0.16	20	pg/g
PCB-179	14	J	0.12	20	pg/g
PCB-180/193	1700	C	0.71	40	pg/g
PCB-181	27		0.72	20	pg/g
PCB-182	4.7	J	0.16	20	pg/g
PCB-183	450		0.54	20	pg/g
PCB-184	0.99 U		0.13	20	pg/g
PCB-185	39		0.92	20	pg/g
PCB-186	0.99 U		0.12	20	pg/g
PCB-187	730		0.13	20	pg/g
PCB-188	4.5	J	0.17	20	pg/g

X ICVR JAC 5412

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-189	35	B	0.30	2.0	pg/g
PCB-190	8.7	J	0.58	20	pg/g
PCB-191	43		0.64	20	pg/g
PCB-192	0.99 U		0.67	20	pg/g
PCB-194	150		0.43	20	pg/g
PCB-195	65		0.44	20	pg/g
PCB-196	75		0.20	20	pg/g
PCB-197	7.6	J	0.13	20	pg/g
PCB-198/199	230	C	0.23	40	pg/g
PCB-200	1.4	J	0.21	20	pg/g
PCB-201	24		0.16	20	pg/g
PCB-202	37		0.18	20	pg/g
PCB-203	160		0.22	20	pg/g
PCB-204	0.99 U		0.16	20	pg/g
PCB-205	6.3	J	0.31	20	pg/g
PCB-206	61		0.32	20	pg/g
PCB-207	10	J	0.20	20	pg/g
PCB-208	24		0.18	20	pg/g
PCB-209	21		0.21	20	pg/g
Total MoCB	4.1		0.20	20	pg/g
Total DiCB	57		0.81	20	pg/g
Total TrCB	570		0.28	20	pg/g
Total TeCB	7200		0.62	20	pg/g
Total PeCB	25000		1.3	20	pg/g
Total HxCB	21000		1.3	20	pg/g
Total HpCB	5000		0.30	20	pg/g
Total OcCB	760		0.31	20	pg/g
Total NoCB	96		0.32	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	**Work Order #....:**	MQN741AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.01 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	46	5.0 - 145
PCB-3L	47	5.0 - 145
PCB-4L	31	5.0 - 145
PCB-19L	37	5.0 - 145
PCB-37L	89	5.0 - 145
PCB-54L	35	5.0 - 145
PCB-77L	88	10 - 145
PCB-81L	90	10 - 145
PCB-104L	49	10 - 145
PCB-105L	78	10 - 145
PCB-114L	79	10 - 145
PCB-118L	78	10 - 145
PCB-123L	79	10 - 145
PCB-126L	74	10 - 145
PCB-155L	79	10 - 145
PCB-156L/157L	143	10 - 145
PCB-167L	143	10 - 145
PCB-169L	130	10 - 145
PCB-188L	73	10 - 145
PCB-189L	128	10 - 145
PCB-202L	90	10 - 145
PCB-205L	88	10 - 145
PCB-206L	80	10 - 145
PCB-208L	95	10 - 145
PCB-209L	68	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	87	5.0 - 145
PCB-178L	71	10 - 145
PCB-111L	79	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	**Work Order #....:**	MQN742AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	4.99
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.01 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-99	**3800**		4.4	100	pg/g
PCB-105	**2500**	B	3.7	10	pg/g
PCB-118	**8200**	B	3.4	10	pg/g
PCB-129/138/163	**9100**	C	1.3	300	pg/g
PCB-153/168	**7400**	C	1.1	200	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-104L	61		10 - 145
PCB-105L	80		10 - 145
PCB-114L	80		10 - 145
PCB-118L	82		10 - 145
PCB-123L	80		10 - 145
PCB-126L	84		10 - 145
PCB-155L	73		10 - 145
PCB-156L/157L	105	C	10 - 145
PCB-167L	100		10 - 145
PCB-169L	102		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	77	5.0 - 145
PCB-178L	81	10 - 145
PCB-111L	82	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.94
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.8	J	0.33	19	pg/g
PCB-2	1.9 U	~~J Q~~	0.33	19	pg/g
PCB-3	0.91	J ~~J Q~~ EMPC	0.32	19	pg/g
PCB-4	12	J	2.3	19	pg/g
PCB-5	9.4 U		2.0	19	pg/g
PCB-6	8.4	J ~~J Q~~ EMPC	2.0	19	pg/g
PCB-7	9.4 U		1.9	19	pg/g
PCB-8	25		2.0	19	pg/g
PCB-9	9.4 U		2.2	19	pg/g
PCB-10	9.4 U		1.3	19	pg/g
PCB-11	25	B	2.1	19	pg/g
PCB-12/13	19 U	C J	2.1	38	pg/g
PCB-14	9.4 U		1.8	19	pg/g
PCB-15	9.4 U	J	1.7	19	pg/g
PCB-16	6.9	J ~~J Q~~ EMPC	0.37	19	pg/g
PCB-17	11	J	0.30	19	pg/g
PCB-18/30	28	C J B	0.25	38	pg/g
PCB-19	11	J	0.42	19	pg/g
PCB-20/28	260	C B	0.58	38	pg/g
PCB-21/33	26	C J B	0.55	38	pg/g
PCB-22	35		0.60	19	pg/g
PCB-23	0.94 U		0.55	19	pg/g
PCB-24	0.94 U		0.23	19	pg/g
PCB-25	13	J	0.57	19	pg/g
PCB-26/29	39	C	0.56	38	pg/g
PCB-27	3.3	J ~~J Q~~ EMPC	0.22	19	pg/g
PCB-31	160	B	0.54	19	pg/g
PCB-32	26	B	0.21	19	pg/g
PCB-34	1.5	J ~~J Q~~ EMPC	0.57	19	pg/g
PCB-35	1.9 U		0.60	19	pg/g
PCB-36	17	J	0.53	19	pg/g
PCB-37	3.5	J B	0.50	19	pg/g
PCB-38	0.94 U		0.60	19	pg/g
PCB-39	0.94 U		0.54	19	pg/g
PCB-40/71	29	C J	0.74	38	pg/g
PCB-41	1.0 U		1.0	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.94
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	9.5	J	0.83	19	pg/g
PCB-43	0.94 U		0.93	19	pg/g
PCB-45	17	J	0.94	19	pg/g
PCB-46	3.8	J	0.93	19	pg/g
PCB-44/47/65	440	J B	0.74	57	pg/g
PCB-48	1.8	J Q EMPC	0.80	19	pg/g
PCB-49/69	560	J B	0.65	38	pg/g
PCB-50/53	47	J	0.76	38	pg/g
PCB-51	7.7	J	0.72	19	pg/g
PCB-54	3.8	J	0.26	19	pg/g
PCB-55	1.9 U		1.0	19	pg/g
PCB-56	39		1.1	19	pg/g
PCB-57	31	J Q EMPC	0.98	19	pg/g
PCB-58	0.97 U		0.97	19	pg/g
PCB-59/62/75	54	J	0.58	57	pg/g
PCB-60	180		1.0	19	pg/g
PCB-61/70/74/76	2400	J B	0.96	76	pg/g
PCB-63	62		0.89	19	pg/g
PCB-64	180		0.54	19	pg/g
PCB-66	1400		1.0	19	pg/g
PCB-67	15	J	0.94	19	pg/g
PCB-68	22	J Q EMPC	0.90	19	pg/g
PCB-72	32		0.95	19	pg/g
PCB-73	0.94 U		0.60	19	pg/g
PCB-77	17		0.84	1.9	pg/g
PCB-78	1.1 U		1.1	19	pg/g
PCB-79	21	J Q EMPC	0.91	19	pg/g
PCB-80	0.94 U		0.88	19	pg/g
PCB-81	2.8	J Q EMPC	0.84	1.9	pg/g
PCB-82	15	J J Q EMPC	2.4	19	pg/g
PCB-83	1.9 U		1.9	19	pg/g
PCB-84	110		2.2	19	pg/g
PCB-85/116/117	1100	J	1.6	57	pg/g
PCB-86/87/97/108/119/125	820	J	1.7	110	pg/g
PCB-88/91	190	J	1.9	38	pg/g
PCB-89	2.1 U		2.1	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.94
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-90/101/113	4300	~~C B~~	1.7	57	pg/g
PCB-92	990		2.0	19	pg/g
PCB-93/100	30	~~C~~ J	1.9	38	pg/g
PCB-94	2.1	J ~~J Q~~ EMPC	2.1	19	pg/g
PCB-95	850	~~B~~	1.9	19	pg/g
PCB-96	3.9	J	0.26	19	pg/g
PCB-98/102	2.0 U		2.0	38	pg/g
PCB-103	29		1.8	19	pg/g
PCB-104	0.94 U		0.34	19	pg/g
PCB-106	1.9 U		1.8	19	pg/g
PCB-109	630		1.2	19	pg/g
PCB-107/124	250	~~C~~	1.5	38	pg/g
PCB-110/115	1400	~~C B~~	1.6	38	pg/g
PCB-111	6.6	J	1.4	19	pg/g
PCB-112	1.9 U		1.9	19	pg/g
PCB-114	200		1.4	1.9	pg/g
PCB-120	50		1.4	19	pg/g
PCB-121	2.4	J ~~J Q~~ EMPC	1.4	19	pg/g
PCB-122	1.5 U		1.5	19	pg/g
PCB-123	120	J FD	1.4	1.9	pg/g
PCB-126	20		1.6	1.9	pg/g
PCB-127	13	J	1.5	19	pg/g
PCB-128/166	1200	~~C~~	0.82	38	pg/g
PCB-130	380		1.1	19	pg/g
PCB-131	4.1	J	1.0	19	pg/g
PCB-132	140		1.0	19	pg/g
PCB-133	75		1.0	19	pg/g
PCB-134/143	17	J ~~C J~~ EMPC	1.1	38	pg/g
PCB-135/151	380	~~C~~	0.95	38	pg/g
PCB-136	56		0.73	19	pg/g
PCB-137	270		0.74	19	pg/g
PCB-139/140	120	~~C~~	0.89	38	pg/g
PCB-141	700		1.2	19	pg/g
PCB-142	1.2 U		1.2	19	pg/g
PCB-144	89		0.93	19	pg/g
PCB-145	0.94 U		0.71	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.94
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-146	1100		0.74	19	pg/g
PCB-147/149	450	¢	0.91	38	pg/g
PCB-148	5.2	J ~~JQ~~ EMPC	0.91	19	pg/g
PCB-150	0.94 U		0.69	19	pg/g
PCB-152	0.94 U		0.67	19	pg/g
PCB-154	73		0.88	19	pg/g
PCB-155	2.1	J ~~JQ~~ EMPC	0.87	19	pg/g
PCB-156/157	1700	~~e~~	1.7	38	pg/g
PCB-158	950		0.73	19	pg/g
PCB-159	1.6 U		1.6	19	pg/g
PCB-160	0.94 U		0.91	19	pg/g
PCB-161	0.94 U		0.92	19	pg/g
PCB-162	69		1.6	19	pg/g
PCB-164	140	J FD	0.94	19	pg/g
PCB-165	1.3	J ~~JQ~~ EMPC	0.79	19	pg/g
PCB-167	590		1.3	1.9	pg/g
PCB-169	1.7 U		1.7	1.9	pg/g
PCB-170	1200		1.3	19	pg/g
PCB-171/173	340	¢	1.3	38	pg/g
PCB-172	220		1.2	19	pg/g
PCB-174	60		1.5	19	pg/g
PCB-175	24		0.24	19	pg/g
PCB-176	5.5	J	0.18	19	pg/g
PCB-177	310		1.3	19	pg/g
PCB-178	62		0.25	19	pg/g
PCB-179	16	J	0.19	19	pg/g
PCB-180/193	2000	¢	1.0	38	pg/g
PCB-181	30		1.0	19	pg/g
PCB-182	4.9	J ~~JQ~~ EMPC	0.24	19	pg/g
PCB-183	550		0.78	19	pg/g
PCB-184	1.6	J	0.20	19	pg/g
PCB-185	1.9 U		1.3	19	pg/g
PCB-186	0.94 U		0.18	19	pg/g
PCB-187	850		0.21	19	pg/g
PCB-188	5.1	J	0.27	19	pg/g
PCB-189	43	~~B~~	0.43	1.9	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0 94
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-190	190		0.85	19	pg/g
PCB-191	50		0.93	19	pg/g
PCB-192	0.96 U		0.96	19	pg/g
PCB-194	200		0.54	19	pg/g
PCB-195	73		0.55	19	pg/g
PCB-196	83		0.33	19	pg/g
PCB-197	8.1	J	0.22	19	pg/g
PCB-198/199	250	~~C~~	0.38	38	pg/g
PCB-200	2.4	J ~~J Q~~ EMPC	0.36	19	pg/g
PCB-201	26		0.27	19	pg/g
PCB-202	44		0.31	19	pg/g
PCB-203	180		0.38	19	pg/g
PCB-204	0.94 U		0.27	19	pg/g
PCB-205	7.5	J	0.36	19	pg/g
PCB-206	71		0.65	19	pg/g
PCB-207	11	J	0.41	19	pg/g
PCB-208	29		0.38	19	pg/g
PCB-209	23		0.29	19	pg/g
Total MoCB	4.7		0.98	19	pg/g
Total DiCB	70		21	19	pg/g
Total TrCB	650		9.3	19	pg/g
Total TeCB	7700		27	19	pg/g
Total PeCB	29000		52	19	pg/g
Total HxCB	24000		33	19	pg/g
Total HpCB	6000		16	19	pg/g
Total OcCB	870		4.0	19	pg/g
Total NoCB	110		1.4	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.94
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	48	5.0 - 145
PCB-3L	49	5.0 - 145
PCB-4L	31	5.0 - 145
PCB-19L	35	5.0 - 145
PCB-37L	86	5.0 - 145
PCB-54L	35	5.0 - 145
PCB-77L	92	10 - 145
PCB-81L	92	10 - 145
PCB-104L	45	10 - 145
PCB-105L	76	10 - 145
PCB-114L	76	10 - 145
PCB-118L	78	10 - 145
PCB-123L	76	10 - 145
PCB-126L	77	10 - 145
PCB-155L	72	10 - 145
PCB-156L/157L	137	10 - 145
PCB-167L	135	10 - 145
PCB-169L	118	10 - 145
PCB-188L	60	10 - 145
PCB-189L	115	10 - 145
PCB-202L	75	10 - 145
PCB-205L	85	10 - 145
PCB-206L	75	10 - 145
PCB-208L	81	10 - 145
PCB-209L	62	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	88	5.0 - 145
PCB-178L	68	10 - 145
PCB-111L	77	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	**Work Order #....:**	MQN751AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.94
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.54 g	**Analyst ID....:**	Sylvia H. Krenn		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer

J Estimated Result

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN752AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	4.74
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-52	2100	B	1.8	95	pg/g
PCB-99	4300		5.0	95	pg/g
PCB-105	2800	B	4.1	9.5	pg/g
PCB-118	9300	B	3.8	9.5	pg/g
PCB-129/138/163	11000	C	1.5	280	pg/g
PCB-153/168	8800	C	1.3	190	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-54L	46		5.0 - 145
PCB-77L	74		10 - 145
PCB-81L	74		10 - 145
PCB-104L	55		10 - 145
PCB-105L	78		10 - 145
PCB-114L	73		10 - 145
PCB-118L	81		10 - 145
PCB-123L	79		10 - 145
PCB-126L	78		10 - 145
PCB-155L	68		10 - 145
PCB-156L/157L	99	C	10 - 145
PCB-167L	91		10 - 145
PCB-169L	97		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	74	5.0 - 145
PCB-178L	77	10 - 145
PCB-111L	79	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level

C Co-eluting isomer.

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

4572

029

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	4.4	J	0.45	19	pg/g
PCB-2	1.5	J ~~J Q~~ EMPC	0.46	19	pg/g
PCB-3	0.86	J ~~J Q~~ EMPC	0.46	19	pg/g
PCB-4	24		2.4	19	pg/g
PCB-5	9.6 U		2.3	19	pg/g
PCB-6	20		2.4	19	pg/g
PCB-7	9.6 U		2.2	19	pg/g
PCB-8	60		2.4	19	pg/g
PCB-9	9.6 U		2.5	19	pg/g
PCB-10	9.6 U		1.4	19	pg/g
PCB-11	32	~~B~~	2.4	19	pg/g
PCB-12/13	19 U		2.4	39	pg/g
PCB-14	9.6 U		2.1	19	pg/g
PCB-15	9.6 U		2.0	19	pg/g
PCB-16	17	J	0.47	19	pg/g
PCB-17	26		0.38	19	pg/g
PCB-18/30	79	~~C B~~	0.32	39	pg/g
PCB-19	29		0.52	19	pg/g
PCB-20/28	460	~~C B~~	0.78	39	pg/g
PCB-21/33	60	~~C B~~	0.74	39	pg/g
PCB-22	80		0.81	19	pg/g
PCB-23	0.96 U		0.75	19	pg/g
PCB-24	0.83	J	0.29	19	pg/g
PCB-25	29		0.77	19	pg/g
PCB-26/29	65	~~C~~	0.76	39	pg/g
PCB-27	7.1	J	0.28	19	pg/g
PCB-31	250	~~B~~	0.73	19	pg/g
PCB-32	47	~~B~~	0.27	19	pg/g
PCB-34	3.7	J ~~J Q~~ EMPC	0.77	19	pg/g
PCB-35	1.9 U		0.81	19	pg/g
PCB-36	28		0.71	19	pg/g
PCB-37	6.9	J ~~B~~	0.68	19	pg/g
PCB-38	0.96 U		0.81	19	pg/g
PCB-39	0.96 U		0.73	19	pg/g
PCB-40/71	75	~~C~~	0.68	39	pg/g
PCB-41	3.0	J	0.96	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	42		0.77	19	pg/g
PCB-43	0.96 U		0.85	19	pg/g
PCB-45	34		0.87	19	pg/g
PCB-46	9.9	J	0.86	19	pg/g
PCB-44/47/65	850	~~C B~~	0.68	58	pg/g
PCB-48	8.4	J	0.73	19	pg/g
PCB-49/69	1000	~~C B~~	0.60	39	pg/g
PCB-50/53	96	~~C~~	0.70	39	pg/g
PCB-51	20		0.66	19	pg/g
PCB-54	6.0	J	0.34	19	pg/g
PCB-55	1.9 U		1.6	19	pg/g
PCB-56	130		1.7	19	pg/g
PCB-57	70		1.6	19	pg/g
PCB-58	1.5 U		1.5	19	pg/g
PCB-59/62/75	85	~~C~~	0.53	58	pg/g
PCB-60	280		1.6	19	pg/g
PCB-61/70/74/76	3500	~~C B~~	1.5	77	pg/g
PCB-63	92		1.4	19	pg/g
PCB-64	330		0.50	19	pg/g
PCB-67	33		1.5	19	pg/g
PCB-68	31	~~J Q~~ EMPC	1.4	19	pg/g
PCB-72	45		1.5	19	pg/g
PCB-73	0.96 U		0.55	19	pg/g
PCB-77	34	~~J Q~~ EMPC	1.4	1.9	pg/g
PCB-78	1.7 U		1.7	19	pg/g
PCB-79	38		1.4	19	pg/g
PCB-80	1.4 U		1.4	19	pg/g
PCB-81	3.4		1.4	1.9	pg/g
PCB-82	48		2.7	19	pg/g
PCB-83	2.2 U		2.2	19	pg/g
PCB-84	280		2.6	19	pg/g
PCB-85/116/117	1100	~~C~~	1.8	77	pg/g
PCB-86/87/97/108/119/125	1300	~~C~~	2.0	120	pg/g
PCB-88/91	290	~~C~~	2.2	39	pg/g
PCB-89	2.5 U		2.5	19	pg/g
PCB-92	1100		2.4	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-93/100	35	J ~~C J~~	2.2	39	pg/g
PCB-94	4.2	J ~~J Q~~ EMPC	2.4	19	pg/g
PCB-95	1700	~~B~~	2.2	19	pg/g
PCB-96	7.5	J	0.35	19	pg/g
PCB-98/102	16	~~C~~ J	2.3	39	pg/g
PCB-103	39		2.1	19	pg/g
PCB-104	0.96 U		0.38	19	pg/g
PCB-106	2.1 U		2.1	19	pg/g
PCB-109	570		1.4	19	pg/g
PCB-107/124	240	~~C~~	1.7	39	pg/g
PCB-110/115	2600	~~C~~ ~~B~~	1.8	39	pg/g
PCB-111	5.6	J ~~J Q~~ EMPC	1.7	19	pg/g
PCB-112	2.2 U		2.2	19	pg/g
PCB-114	170		1.7	1.9	pg/g
PCB-120	42		1.7	19	pg/g
PCB-121	2.1	J ~~J Q~~ EMPC	1.7	19	pg/g
PCB-122	1.8 U		1.8	19	pg/g
PCB-123	96		1.7	1.9	pg/g
PCB-126	23	~~C~~	2.0	2.0	pg/g
PCB-127	8.8	J	1.8	19	pg/g
PCB-128/166	840	~~C~~	0.72	39	pg/g
PCB-130	340		0.97	19	pg/g
PCB-131	5.2	J	0.92	19	pg/g
PCB-132	210		0.91	19	pg/g
PCB-133	81		0.89	19	pg/g
PCB-134/143	27	~~C~~ J	0.98	39	pg/g
PCB-135/151	400	~~C~~	0.83	39	pg/g
PCB-136	85		0.64	19	pg/g
PCB-137	210		0.65	19	pg/g
PCB-139/140	82	~~C~~	0.79	39	pg/g
PCB-141	540		1.0	19	pg/g
PCB-142	1.1 U		1.1	19	pg/g
PCB-144	76		0.82	19	pg/g
PCB-145	0.96 U		0.63	19	pg/g
PCB-146	860		0.66	19	pg/g
PCB-147/149	560	~~C~~	0.80	39	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

4512

032

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-148	0.96 U		0.80	19	pg/g
PCB-150	0.96 U		0.61	19	pg/g
PCB-152	0.96 U		0.59	19	pg/g
PCB-154	51		0.77	19	pg/g
PCB-155	0.96 U		0.77	19	pg/g
PCB-156/157	1300	C	2.1	3.9	pg/g
PCB-158	670		0.64	19	pg/g
PCB-159	1.9 U		1.9	19	pg/g
PCB-160	0.96 U		0.81	19	pg/g
PCB-161	0.96 U		0.81	19	pg/g
PCB-162	54		1.9	19	pg/g
PCB-164	130		0.83	19	pg/g
PCB-165	0.96 U		0.69	19	pg/g
PCB-167	420		1.6	1.9	pg/g
PCB-169	2.1 U		2.1	2.1	pg/g
PCB-170	760		1.6	19	pg/g
PCB-171/173	200	C	1.6	39	pg/g
PCB-172	160		1.5	19	pg/g
PCB-174	77		1.9	19	pg/g
PCB-175	13	J ~~J Q~~ EMPC	0.38	19	pg/g
PCB-176	6.3	J	0.28	19	pg/g
PCB-177	300		1.6	19	pg/g
PCB-178	71		0.40	19	pg/g
PCB-179	17	J	0.30	19	pg/g
PCB-180/193	1400	C	1.3	39	pg/g
PCB-181	14	J ~~J Q~~ EMPC	1.3	19	pg/g
PCB-182	3.1	J	0.39	19	pg/g
PCB-183	340		0.98	19	pg/g
PCB-184	0.96 U		0.31	19	pg/g
PCB-185	27	J Q EMPC	1.7	19	pg/g
PCB-186	0.96 U		0.29	19	pg/g
PCB-187	580		0.33	19	pg/g
PCB-188	2.4	J J Q EMPC	0.42	19	pg/g
PCB-189	22	J Q B EMPC	0.51	1.9	pg/g
PCB-190	130		1.1	19	pg/g
PCB-191	32		1.2	19	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

4512

033

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	**Work Order #....:**	MQN761AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.96
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.34 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-192	1.2 U		1.2	19	pg/g
PCB-194	110		0.63	19	pg/g
PCB-195	43		0.65	19	pg/g
PCB-196	54		0.67	19	pg/g
PCB-197	5.6	J ~~J Q~~ EMPC	0.44	19	pg/g
PCB-198/199	160	C	0.77	39	pg/g
PCB-200	1.9 U		0.72	19	pg/g
PCB-201	17	J	0.53	19	pg/g
PCB-202	37		0.61	19	pg/g
PCB-203	100		0.75	19	pg/g
PCB-204	0.96 U		0.54	19	pg/g
PCB-205	2.5	J ~~J Q~~ EMPC	0.43	19	pg/g
PCB-206	42		1.3	19	pg/g
PCB-207	6.6	J	0.89	19	pg/g
PCB-208	17	J	0.85	19	pg/g
PCB-209	13	J	0.44	19	pg/g
Total MoCB	6.8		1.4	19	pg/g
Total DiCB	140		24	19	pg/g
Total TrCB	1200		12	19	pg/g
Total TeCB	12000		35	19	pg/g
Total PeCB	33000		61	19	pg/g
Total HxCB	19000		32	19	pg/g
Total HpCB	4100		21	19	pg/g
Total OcCB	530		6.7	19	pg/g
Total NoCB	66		3.1	19	pg/g

CH2M Hill Inc
Sample ID: VWW06-FS02-0212
Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	**Work Order #....:**	MQN761AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.96
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.34 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	52	5.0 - 145
PCB-3L	52	5.0 - 145
PCB-4L	33	5.0 - 145
PCB-19L	38	5.0 - 145
PCB-37L	93	5.0 - 145
PCB-54L	36	5.0 - 145
PCB-77L	90	10 - 145
PCB-81L	91	10 - 145
PCB-104L	52	10 - 145
PCB-105L	78	10 - 145
PCB-114L	81	10 - 145
PCB-118L	80	10 - 145
PCB-123L	79	10 - 145
PCB-126L	78	10 - 145
PCB-155L	79	10 - 145
PCB-156L/157L	142	10 - 145
PCB-167L	142	10 - 145
PCB-169L	127	10 - 145
PCB-188L	71	10 - 145
PCB-189L	125	10 - 145
PCB-202L	87	10 - 145
PCB-205L	89	10 - 145
PCB-206L	80	10 - 145
PCB-208L	87	10 - 145
PCB-209L	64	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	92	5.0 - 145
PCB-178L	69	10 - 145
PCB-111L	82	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	**Work Order #....:**	MQN761AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.96
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.34 g	**Analyst ID....:**	Sylvia H. Krenn		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

G Elevated reporting limit. The reporting limit is elevated due to matrix interference.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN762AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	4.83
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-52	3100	B	2.8	97	pg/g
PCB-66	1700		4.0	97	pg/g
PCB-90/101/113	5800	C	5.7	290	pg/g
PCB-99	3700		5.7	97	pg/g
PCB-105	2600	B	5.0	9.7	pg/g
PCB-118	8200	B	4.5	9.7	pg/g
PCB-129/138/163	7800	C	2.6	290	pg/g
PCB-153/168	6400	C	2.3	190	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-54L	47		5.0 - 145
PCB-77L	77		10 - 145
PCB-81L	78		10 - 145
PCB-104L	61		10 - 145
PCB-105L	82		10 - 145
PCB-114L	82		10 - 145
PCB-118L	85		10 - 145
PCB-123L	84		10 - 145
PCB-126L	83		10 - 145
PCB-155L	74		10 - 145
PCB-156L/157L	103	C	10 - 145
PCB-167L	105		10 - 145
PCB-169L	104		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	81	5.0 - 145
PCB-178L	81	10 - 145
PCB-111L	85	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

4512

037

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	49.4
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	24	J Q	4.9	990	pg/g
PCB-2	25	J	5.1	990	pg/g
PCB-3	14	J Q	5.2	990	pg/g
PCB-4	190	J	34	990	pg/g
PCB-5	490 U		42	990	pg/g
PCB-6	210	J Q	43	990	pg/g
PCB-7	50	J	40	990	pg/g
PCB-8	700	J Q	42	990	pg/g
PCB-9	68	J	46	990	pg/g
PCB-10	490 U		29	990	pg/g
PCB-11	770	J Q B	44	990	pg/g
PCB-12/13	990 U		44	2000	pg/g
PCB-14	490 U		37	990	pg/g
PCB-15	280	J	45	990	pg/g
PCB-16	170	J	6.9	990	pg/g
PCB-17	530	J	5.6	990	pg/g
PCB-18/30	1100	C J B	4.8	200000	pg/g
PCB-19	200	J	5.1	990	pg/g
PCB-20/28	5600	C B	13	2000	pg/g
PCB-21/33	1600	C J B	12	2000	pg/g
PCB-22	940	J	13	990	pg/g
PCB-23	49 U		12	990	pg/g
PCB-24	12	J Q	4.3	990	pg/g
PCB-25	440	J	13	990	pg/g
PCB-26/29	900	C J	13	2000	pg/g
PCB-27	130	J	4.2	990	pg/g
PCB-31	4100	B	12	990	pg/g
PCB-32	1300	B	4.0	990	pg/g
PCB-34	59	J	13	990	pg/g
PCB-35	99 U		14	990	pg/g
PCB-36	520	J	12	990	pg/g
PCB-37	560	J B	15	990	pg/g
PCB-38	49 U		13	990	pg/g
PCB-39	13	J Q	12	990	pg/g
PCB-40/71	3400	C	8.8	2000	pg/g
PCB-41	49 U		12	990	pg/g

exclude DL

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN781AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	49.4
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	1500		9.9	990	pg/g
PCB-43	49 U		11	990	pg/g
PCB-45	540	J	11	990	pg/g
PCB-46	200	J	11	990	pg/g
PCB-44/47/65	20000	C B	8.8	3000	pg/g
PCB-48	840	J	9.4	990	pg/g
PCB-49/69	20000	C B	7.7	2000	pg/g
PCB-50/53	2000	C	9.0	2000	pg/g
PCB-51	740	J	8.5	990	pg/g
PCB-52	58000	B	9.6	990	pg/g
PCB-54	38	J	2.8	990	pg/g
PCB-55	99 U		21	990	pg/g
PCB-56	4800		22	990	pg/g
PCB-57	2100		20	990	pg/g
PCB-58	49 U		20	990	pg/g
PCB-59/62/75	1200	C J	6.9	3000	pg/g
PCB-60	2700		21	990	pg/g
PCB-61/70/74/76	51000	C B	20	4000	pg/g
PCB-63	910	J	18	990	pg/g
PCB-64	7000		6.4	990	pg/g
PCB-66	22000		21	990	pg/g
PCB-67	560	J	19	990	pg/g
PCB-68	320	J	19	990	pg/g
PCB-72	630	J	20	990	pg/g
PCB-73	49 U		7.1	990	pg/g
PCB-77	640		22	99	pg/g
PCB-78	49 U		22	990	pg/g
PCB-79	1800		19	990	pg/g
PCB-80	49 U		18	990	pg/g
PCB-81	49 U		19	99	pg/g
PCB-82	3600		30	990	pg/g
PCB-83	49 U		24	990	pg/g
PCB-84	13000		28	990	pg/g
PCB-85/116/117	15000	C	20	3000	pg/g
PCB-86/87/97/108/119/125	61000	C	21	5900	pg/g
PCB-88/91	11000	C	24	2000	pg/g

exclude DL

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	49.4
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	310	J	26	990	pg/g
PCB-90/101/113	150000	C B	22	3000	pg/g
PCB-92	25000		25	990	pg/g
PCB-93/100	600	C J	23	2000	pg/g
PCB-94	170	J	26	990	pg/g
PCB-95	65000	B	24	990	pg/g
PCB-96	130	J	3.2	990	pg/g
PCB-98/102	1700	C J	25	2000	pg/g
PCB-99	61000		22	990	pg/g
PCB-103	780	J	22	990	pg/g
PCB-104	49 U		3.5	990	pg/g
PCB-105	31000	B	17	99	pg/g
PCB-106	99 U		23	990	pg/g
PCB-109	6700		15	990	pg/g
PCB-107/124	4100	C	19	2000	pg/g
PCB-110/115	120000	C B	20	2000	pg/g
PCB-111	77	J	18	990	pg/g
PCB-112	49 U		23	990	pg/g
PCB-114	2100		18	99	pg/g
PCB-118	100000	E B	17	99	pg/g
PCB-120	360	J	18	990	pg/g
PCB-121	49 U		18	990	pg/g
PCB-122	1100		19	990	pg/g
PCB-123	900		19	99	pg/g
PCB-126	120		24	99	pg/g
PCB-127	140	J Q	19	990	pg/g
PCB-128/166	15000	C	10	2000	pg/g
PCB-129/138/163	100000	C	10	3000	pg/g
PCB-130	6700		14	990	pg/g
PCB-131	450	J	13	990	pg/g
PCB-132	20000		13	990	pg/g
PCB-133	1400		12	990	pg/g
PCB-134/143	3000	C	14	2000	pg/g
PCB-135/151	20000	C	12	2000	pg/g
PCB-136	7400		9.0	990	pg/g
PCB-137	4300		9.1	990	pg/g

exclude DL

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

4/5/12

040

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	49.4
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	1900	C J	11	2000	pg/g
PCB-141	15000		15	990	pg/g
PCB-142	49 U		15	990	pg/g
PCB-144	2900		11	990	pg/g
PCB-145	19	J Q	8.8	990	pg/g
PCB-146	11000		9.2	990	pg/g
PCB-147/149	55000	C	11	2000	pg/g
PCB-148	82	J	11	990	pg/g
PCB-150	93	J	8.5	990	pg/g
PCB-152	47	J	8.2	990	pg/g
PCB-153/168	76000	C	8.9	2000	pg/g
PCB-154	960	J	11	990	pg/g
PCB-155	11	J Q	8.4	990	pg/g
PCB-156/157	14000	C	20	200	pg/g
PCB-158	11000		9.0	990	pg/g
PCB-159	170	J	17	990	pg/g
PCB-160	49 U		11	990	pg/g
PCB-161	49 U		11	990	pg/g
PCB-162	560	J	17	990	pg/g
PCB-164	6000		12	990	pg/g
PCB-165	49 U		9.7	990	pg/g
PCB-167	5000		15	99	pg/g
PCB-169	49 U		19	99	pg/g
PCB-170	10000		14	990	pg/g
PCB-171/173	3300	C	14	2000	pg/g
PCB-172	1600		13	990	pg/g
PCB-174	7000		16	990	pg/g
PCB-175	320	J	4.1	990	pg/g
PCB-176	580	J	3.0	990	pg/g
PCB-177	5500		14	990	pg/g
PCB-178	1500		4.2	990	pg/g
PCB-179	2400		3.2	990	pg/g
PCB-180/193	16000	C	11	2000	pg/g
PCB-181	210	J Q	11	990	pg/g
PCB-182	60	J Q	4.1	990	pg/g
PCB-183	4300		8.5	990	pg/g

exclude DL

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

041

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	49.4
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	16	J Q	3.3	990	pg/g
PCB-185	99 U		15	990	pg/g
PCB-186	49 U		3.1	990	pg/g
PCB-187	7800		3.5	990	pg/g
PCB-188	46	J	3.9	990	pg/g
PCB-189	310	B	4.9	99	pg/g
PCB-190	1700		9.2	990	pg/g
PCB-191	440	J	10	990	pg/g
PCB-192	49 U		11	990	pg/g
PCB-194	1600		6.8	990	pg/g
PCB-195	630	J	7.0	990	pg/g
PCB-196	780	J	4.5	990	pg/g
PCB-197	71	J	3.0	990	pg/g
PCB-198/199	2300	C	5.2	2000	pg/g
PCB-200	140	J	4.8	990	pg/g
PCB-201	270	J	3.6	990	pg/g
PCB-202	590	J	4.3	990	pg/g
PCB-203	1500		5.1	990	pg/g
PCB-204	49 U		3.6	990	pg/g
PCB-205	87	J	4.4	990	pg/g
PCB-206	700	J	4.3	990	pg/g
PCB-207	100	J	3.1	990	pg/g
PCB-208	300	J	3.1	990	pg/g
PCB-209	250	J	2.6	990	pg/g
Total MoCB	63		5.2	990	pg/g
Total DiCB	2200		45	990	pg/g
Total TrCB	18000		15	990	pg/g
Total TeCB	200000		22	990	pg/g
Total PeCB	670000		24	990	pg/g
Total HxCB	380000		19	990	pg/g
Total HpCB	64000		4.9	990	pg/g
Total OcCB	8000		4.4	990	pg/g
Total NoCB	1100		4.3	990	pg/g

exclude DL

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

042

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN781AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	49.4
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-1L	49		5 0 - 145
PCB-3L	59		5.0 - 145
PCB-4L	44		5 0 - 145
PCB-19L	67		5 0 - 145
PCB-37L	70		5.0 - 145
PCB-54L	49		5.0 - 145
PCB-77L	91		10 - 145
PCB-81L	88		10 - 145
PCB-104L	55		10 - 145
PCB-105L	82		10 - 145
PCB-114L	83		10 - 145
PCB-118L	83		10 - 145
PCB-123L	81		10 - 145
PCB-126L	79		10 - 145
PCB-155L	78		10 - 145
PCB-156L/157L	105	C	10 - 145
PCB-167L	99		10 - 145
PCB-169L	101		10 - 145
PCB-188L	73		10 - 145
PCB-189L	94		10 - 145
PCB-202L	75		10 - 145
PCB-205L	88		10 - 145
PCB-206L	95		10 - 145
PCB-208L	89		10 - 145
PCB-209L	80		10 - 145

exclude DL

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	88	5 0 - 145
PCB-178L	74	10 - 145
PCB-111L	78	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN781AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	49.4
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Sylvia H. Krenn		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

E Estimated result. Result concentration exceeds the calibration range.

J Estimated Result

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	5.8 U		5.8	2000	pg/g
PCB-2	6.0 U		6.0	2000	pg/g
PCB-3	6.2 U		6.2	2000	pg/g
PCB-4	46 U		46	2000	pg/g
PCB-5	52 U		52	2000	pg/g
PCB-6	53 U		53	2000	pg/g
PCB-7	51 U		51	2000	pg/g
PCB-8	280	J ~~JQ~~ EMPC	53	2000	pg/g
PCB-9	57 U		57	2000	pg/g
PCB-10	34 U		34	2000	pg/g
PCB-11	310	J B	55	2000	pg/g
PCB-12/13	55 U		55	4000	pg/g
PCB-14	46 U		46	2000	pg/g
PCB-15	52 U		52	2000	pg/g
PCB-16	76	J ~~JQ~~ EMPC	8.7	2000	pg/g
PCB-17	270	J	7.1	2000	pg/g
PCB-18/30	570	C J B	6.0	4000	pg/g
PCB-19	110	J	6.7	2000	pg/g
PCB-20/28	2600	C J B	12	4000	pg/g
PCB-21/33	790	C J B	11	4000	pg/g
PCB-22	430	J	12	2000	pg/g
PCB-23	11 U		11	2000	pg/g
PCB-24	5.5 U		5.5	2000	pg/g
PCB-25	210	J	12	2000	pg/g
PCB-26/29	440	C J	11	4000	pg/g
PCB-27	68	J	5.3	2000	pg/g
PCB-31	1900	J B	11	2000	pg/g
PCB-32	630	J B	5.1	2000	pg/g
PCB-34	12 U		12	2000	pg/g
PCB-35	12 U		12	2000	pg/g
PCB-36	240	J	11	2000	pg/g
PCB-37	270	J B	13	2000	pg/g
PCB-38	12 U		12	2000	pg/g
PCB-39	11 U		11	2000	pg/g
PCB-40/71	1800	C J	11	4000	pg/g
PCB-41	56	J	16	2000	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	780	J	13	2000	pg/g
PCB-43	140	J	14	2000	pg/g
PCB-45	220	J	14	2000	pg/g
PCB-46	120	J	14	2000	pg/g
PCB-44/47/65	11000	C B	11	5900	pg/g
PCB-48	460	J	12	2000	pg/g
PCB-49/69	10000	C B	9.9	4000	pg/g
PCB-50/53	1000	C J	12	4000	pg/g
PCB-51	420	J	11	2000	pg/g
PCB-52	31000	B	12	2000	pg/g
PCB-54	4.7 U		4.7	2000	pg/g
PCB-55	28 U		28	2000	pg/g
PCB-56	2400		29	2000	pg/g
PCB-57	1200	J	27	2000	pg/g
PCB-58	27 U		27	2000	pg/g
PCB-59/62/75	630	C J	8.8	5900	pg/g
PCB-60	1400	J	28	2000	pg/g
PCB-61/70/74/76	26000	C B	27	7900	pg/g
PCB-63	460	J	25	2000	pg/g
PCB-64	3700		8.3	2000	pg/g
PCB-66	11000		28	2000	pg/g
PCB-67	310	J	26	2000	pg/g
PCB-68	180	J	25	2000	pg/g
PCB-72	320	J	26	2000	pg/g
PCB-73	9.0 U		9.0	2000	pg/g
PCB-77	380		32	200	pg/g
PCB-78	30 U		30	2000	pg/g
PCB-79	460	J	25	2000	pg/g
PCB-80	25 U		25	2000	pg/g
PCB-81	30 U		30	200	pg/g
PCB-82	2100		64	2000	pg/g
PCB-83	52 U		52	2000	pg/g
PCB-84	6900		61	2000	pg/g
PCB-85/116/117	7700	C	43	5900	pg/g
PCB-86/87/97/108/119/125	33000	C	47	12000	pg/g
PCB-88/91	6000	C	52	4000	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN782AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	03/06/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	170	J	58	2000	pg/g
PCB-90/101/113	80000	C B	47	5900	pg/g
PCB-92	14000		55	2000	pg/g
PCB-93/100	370	C J	51	4000	pg/g
PCB-94	88	J	57	2000	pg/g
PCB-95	35000	B	53	2000	pg/g
PCB-96	85	J	5.3	2000	pg/g
PCB-98/102	930	C J	54	4000	pg/g
PCB-99	33000		47	2000	pg/g
PCB-103	430	J	49	2000	pg/g
PCB-104	3.4 U		3.4	2000	pg/g
PCB-105	16000	B	45	200	pg/g
PCB-106	50 U		50	2000	pg/g
PCB-109	3300		33	2000	pg/g
PCB-107/124	2100	C J	41	4000	pg/g
PCB-110/115	70000	C B	43	4000	pg/g
PCB-111	39 U		39	2000	pg/g
PCB-112	51 U		51	2000	pg/g
PCB-114	1300		46	200	pg/g
PCB-118	54000	B	39	200	pg/g
PCB-120	160	J ~~J~~ Q EMPC	39	2000	pg/g
PCB-121	39 U		39	2000	pg/g
PCB-122	41 U		41	2000	pg/g
PCB-123	530		43	200	pg/g
PCB-126	150	J	56	200	pg/g
PCB-127	41 U		41	2000	pg/g
PCB-128/166	8600	C	12	4000	pg/g
PCB-129/138/163	59000	C	12	5900	pg/g
PCB-130	3800		16	2000	pg/g
PCB-131	270	J	15	2000	pg/g
PCB-132	12000		15	2000	pg/g
PCB-133	870	J	15	2000	pg/g
PCB-134/143	1800	C J	16	4000	pg/g
PCB-135/151	12000	C	14	4000	pg/g
PCB-136	4800		11	2000	pg/g
PCB-137	2400		11	2000	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	1100	~~C~~ J	13	4000	pg/g
PCB-141	8800		17	2000	pg/g
PCB-142	18 U		18	2000	pg/g
PCB-144	1800	J	14	2000	pg/g
PCB-145	11 U		11	2000	pg/g
PCB-146	6800		11	2000	pg/g
PCB-147/149	35000	~~C~~	13	4000	pg/g
PCB-148	13 U		13	2000	pg/g
PCB-150	18	J ~~J Q~~ EMPC	10	2000	pg/g
PCB-152	24	J ~~J Q~~ EMPC	9.8	2000	pg/g
PCB-153/168	46000	~~C~~	11	4000	pg/g
PCB-154	600	J	13	2000	pg/g
PCB-155	7.9 U		7.9	2000	pg/g
PCB-156/157	8000	~~C~~	32	400	pg/g
PCB-158	6600		11	2000	pg/g
PCB-159	68	J	25	2000	pg/g
PCB-160	13 U		13	2000	pg/g
PCB-161	14 U		14	2000	pg/g
PCB-162	350	J	25	2000	pg/g
PCB-164	3400		14	2000	pg/g
PCB-165	12 U		12	2000	pg/g
PCB-167	2700		24	200	pg/g
PCB-169	34 U		34	200	pg/g
PCB-170	4900		21	2000	pg/g
PCB-171/173	1700	~~C~~ J	22	4000	pg/g
PCB-172	820	J	20	2000	pg/g
PCB-174	3800		25	2000	pg/g
PCB-175	180	J	8.3	2000	pg/g
PCB-176	340	J	6.1	2000	pg/g
PCB-177	2900		21	2000	pg/g
PCB-178	850	J	8.6	2000	pg/g
PCB-179	1400	J	6.5	2000	pg/g
PCB-180/193	8500	~~C~~	17	4000	pg/g
PCB-181	69	J ~~J Q~~ EMPC	17	2000	pg/g
PCB-182	37	J ~~J Q~~ EMPC	8.4	2000	pg/g
PCB-183	2400		13	2000	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN782AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	03/06/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	6.8 U		6.8	2000	pg/g
PCB-185	22 U		22	2000	pg/g
PCB-186	6.3 U		6.3	2000	pg/g
PCB-187	4500		7.2	2000	pg/g
PCB-188	14	J ~~J Q~~ EMPC	7.1	2000	pg/g
PCB-189	150	J ~~B~~	8.8	200	pg/g
PCB-190	840	J	14	2000	pg/g
PCB-191	280	J	15	2000	pg/g
PCB-192	16 U		16	2000	pg/g
PCB-194	840	J	8.8	2000	pg/g
PCB-195	310	J	9.0	2000	pg/g
PCB-196	470	J	10	2000	pg/g
PCB-197	48	J ~~J Q~~ EMPC	6.8	2000	pg/g
PCB-198/199	1200	~~C~~ J	12	4000	pg/g
PCB-200	68	J	11	2000	pg/g
PCB-201	150	J	8.2	2000	pg/g
PCB-202	320	J	9.6	2000	pg/g
PCB-203	730	J	12	2000	pg/g
PCB-204	8.3 U		8.3	2000	pg/g
PCB-205	36	J ~~J Q~~ EMPC	5.9	2000	pg/g
PCB-206	450	J	6.1	2000	pg/g
PCB-207	69	J	4.2	2000	pg/g
PCB-208	160	J ~~J Q~~ EMPC	4.2	2000	pg/g
PCB-209	130	J	3.2	2000	pg/g
Total MoCB	6.2 U	U	6.2	2000	pg/g
Total DiCB	590		52	2000	pg/g
Total TrCB	8700		13	2000	pg/g
Total TeCB	110000		32	2000	pg/g
Total PeCB	370000		56	2000	pg/g
Total HxCB	230000		34	2000	pg/g
Total HpCB	34000		8.8	2000	pg/g
Total OcCB	4200		5.9	2000	pg/g
Total NoCB	680		6.1	2000	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN782AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	03/06/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	98	5.0 - 145
PCB-3L	101	5.0 - 145
PCB-4L	84	5.0 - 145
PCB-19L	95	5.0 - 145
PCB-37L	113	5.0 - 145
PCB-54L	88	5.0 - 145
PCB-77L	106	10 - 145
PCB-81L	109	10 - 145
PCB-104L	101	10 - 145
PCB-105L	100	10 - 145
PCB-114L	100	10 - 145
PCB-118L	107	10 - 145
PCB-123L	104	10 - 145
PCB-126L	91	10 - 145
PCB-155L	120	10 - 145
PCB-156L/157L	124	10 - 145
PCB-167L	127	10 - 145
PCB-169L	109	10 - 145
PCB-188L	109	10 - 145
PCB-189L	120	10 - 145
PCB-202L	113	10 - 145
PCB-205L	112	10 - 145
PCB-206L	113	10 - 145
PCB-208L	123	10 - 145
PCB-209L	117	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	93	5.0 - 145
PCB-178L	63	10 - 145
PCB-111L	63	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN782AF	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date.....:	02/14/12	**Analysis Date.....:**	03/06/12		
Prep Batch # ....:	2045127	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID.....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN791AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.1	J	0.30	20	pg/g
PCB-2	1.2	J ~~J Q~~ EMPC	0.31	20	pg/g
PCB-3	1.6	J ~~J Q~~ EMC	0.31	20	pg/g
PCB-4	4.9	J	2.3	20	pg/g
PCB-5	9.8 U		1.9	20	pg/g
PCB-6	7.4	J	2.0	20	pg/g
PCB-7	9.8 U		1.9	20	pg/g
PCB-8	32		2.0	20	pg/g
PCB-9	9.8 U		2.1	20	pg/g
PCB-10	9.8 U		1.6	20	pg/g
PCB-11	26	B	2.0	20	pg/g
PCB-12/13	20 U		2.0	40	pg/g
PCB-14	9.8 U		1.7	20	pg/g
PCB-15	4.0	J ~~J Q~~ EMC	1.8	20	pg/g
PCB-16	8.9	J	0.36	20	pg/g
PCB-17	25		0.30	20	pg/g
PCB-18/30	46	C B	0.25	40	pg/g
PCB-19	8.0	J	0.33	20	pg/g
PCB-20/28	180	C B	0.57	40	pg/g
PCB-21/33	88	C B	0.55	40	pg/g
PCB-22	37		0.60	20	pg/g
PCB-23	0.98 U		0.55	20	pg/g
PCB-24	0.98 U		0.23	20	pg/g
PCB-25	14	J	0.57	20	pg/g
PCB-26/29	30	C J	0.56	40	pg/g
PCB-27	5.2	J	0.22	20	pg/g
PCB-31	130	B	0.54	20	pg/g
PCB-32	50	B	0.21	20	pg/g
PCB-34	3.2	J	0.57	20	pg/g
PCB-35	2.0 U		0.60	20	pg/g
PCB-36	13	J	0.53	20	pg/g
PCB-37	14	J ~~J Q~~ B EMC	0.56	20	pg/g
PCB-38	0.98 U		0.60	20	pg/g
PCB-39	1.1	J	0.54	20	pg/g
PCB-40/71	160	C	0.29	40	pg/g
PCB-41	5.4	J	0.41	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN791AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	60		0.33	20	pg/g
PCB-43	11	J	0.36	20	pg/g
PCB-45	18	J	0.37	20	pg/g
PCB-46	7.7	J	0.36	20	pg/g
PCB-44/47/65	560	C B	0.29	59	pg/g
PCB-48	41		0.31	20	pg/g
PCB-49/69	510	C B	0.25	40	pg/g
PCB-50/53	68	C	0.30	40	pg/g
PCB-51	31		0.28	20	pg/g
PCB-52	1500	B	0.32	20	pg/g
PCB-54	1.4	J	0.19	20	pg/g
PCB-55	10	J	0.93	20	pg/g
PCB-56	160		0.95	20	pg/g
PCB-57	2.9	J	0.89	20	pg/g
PCB-58	2.5	J J Q EMPC	0.88	20	pg/g
PCB-59/62/75	38	C	0.23	59	pg/g
PCB-60	82		0.92	20	pg/g
PCB-61/70/74/76	1300	C B	0.87	79	pg/g
PCB-63	25		0.80	20	pg/g
PCB-64	200		0.21	20	pg/g
PCB-66	580		0.91	20	pg/g
PCB-67	17	J	0.85	20	pg/g
PCB-68	10	J	0.82	20	pg/g
PCB-72	16	J	0.86	20	pg/g
PCB-73	0.98 U		0.23	20	pg/g
PCB-77	24		0.86	2.0	pg/g
PCB-78	0.98 U		0.97	20	pg/g
PCB-79	15	J J Q EMPC	0.83	20	pg/g
PCB-80	0.98 U		0.80	20	pg/g
PCB-81	2.0		0.87	2.0	pg/g
PCB-82	120		1.7	20	pg/g
PCB-83	140		1.4	20	pg/g
PCB-84	380		1.6	20	pg/g
PCB-85/116/117	460	C	1.1	59	pg/g
PCB-86/87/97/108/119/125	1600	C	1.2	120	pg/g
PCB-88/91	300	C	1.4	40	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

053

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	**Work Order #....:**	MQN791AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	14	J	1.5	20	pg/g
PCB-90/101/113	3600	C B	1.2	59	pg/g
PCB-92	660		1.4	20	pg/g
PCB-93/100	17	C J	1.3	40	pg/g
PCB-94	6.6	J	1.5	20	pg/g
PCB-95	1600	B	1.4	20	pg/g
PCB-96	4.1	J	0.16	20	pg/g
PCB-98/102	60	C	1.4	40	pg/g
PCB-99	1500		1.2	20	pg/g
PCB-103	22		1.3	20	pg/g
PCB-104	0.98 U		0.16	20	pg/g
PCB-105	740	B	1.0	2.0	pg/g
PCB-106	2.0 U		1.3	20	pg/g
PCB-109	180		0.85	20	pg/g
PCB-107/124	110	C	1.1	40	pg/g
PCB-110/115	3200	C B	1.1	40	pg/g
PCB-111	2.3	J ~~J Q~~ EMPC	1.0	20	pg/g
PCB-112	1.3 U		1.3	20	pg/g
PCB-114	52		1.1	2.0	pg/g
PCB-120	11	J	1.0	20	pg/g
PCB-121	1.0 U		1.0	20	pg/g
PCB-122	27		1.1	20	pg/g
PCB-123	22		1.1	2.0	pg/g
PCB-126	5.5		1.2	2.0	pg/g
PCB-127	4.1	J	1.1	20	pg/g
PCB-128/166	430	C	0.31	40	pg/g
PCB-129/138/163	2800	C	0.32	59	pg/g
PCB-130	200		0.43	20	pg/g
PCB-131	11	J ~~J Q~~ EMPC	0.40	20	pg/g
PCB-132	650		0.40	20	pg/g
PCB-133	46		0.39	20	pg/g
PCB-134/143	88	C	0.43	40	pg/g
PCB-135/151	610	C	0.36	40	pg/g
PCB-136	210		0.28	20	pg/g
PCB-137	110		0.29	20	pg/g
PCB-139/140	54	C	0.34	40	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	**Work Order #....:**	MQN791AD	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-141	430		0.45	20	pg/g
PCB-142	0.98 U		0.46	20	pg/g
PCB-144	84		0.36	20	pg/g
PCB-145	0.98 U		0.28	20	pg/g
PCB-146	340		0.29	20	pg/g
PCB-147/149	1700	C	0.35	40	pg/g
PCB-148	2.8	J	0.35	20	pg/g
PCB-150	2.9	J	0.27	20	pg/g
PCB-152	0.82	J Q EMPC	0.26	20	pg/g
PCB-153/168	2200	C	0.28	40	pg/g
PCB-154	31		0.34	20	pg/g
PCB-155	0.98 U		0.29	20	pg/g
PCB-156/157	380	C	0.96	4.0	pg/g
PCB-158	300		0.28	20	pg/g
PCB-159	5.4	J	0.84	20	pg/g
PCB-160	0.98 U		0.35	20	pg/g
PCB-161	0.98 U		0.35	20	pg/g
PCB-162	14	J	0.85	20	pg/g
PCB-164	190		0.36	20	pg/g
PCB-165	0.98 U		0.30	20	pg/g
PCB-167	130		0.74	2.0	pg/g
PCB-169	0.98 U		0.96	2.0	pg/g
PCB-170	340		0.77	20	pg/g
PCB-171/173	110	C	0.78	40	pg/g
PCB-172	64		0.73	20	pg/g
PCB-174	290		0.90	20	pg/g
PCB-175	12	J	0.23	20	pg/g
PCB-176	21		0.17	20	pg/g
PCB-177	220		0.76	20	pg/g
PCB-178	63		0.24	20	pg/g
PCB-179	92		0.18	20	pg/g
PCB-180/193	580	C	0.62	40	pg/g
PCB-181	8.3	J	0.63	20	pg/g
PCB-182	3.0	J	0.23	20	pg/g
PCB-183	160		0.47	20	pg/g
PCB-184	0.98 U		0.19	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	**Work Order #....:**	MQN791AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-185	23		0.81	20	pg/g
PCB-186	0.98 U		0.18	20	pg/g
PCB-187	330		0.20	20	pg/g
PCB-188	1.1	J ~~J Q~~ EMPC	0.21	20	pg/g
PCB-189	9.8	~~J~~	0.32	2.0	pg/g
PCB-190	50		0.51	20	pg/g
PCB-191	15	J	0.56	20	pg/g
PCB-192	0.98 U		0.58	20	pg/g
PCB-194	66		0.43	20	pg/g
PCB-195	31		0.44	20	pg/g
PCB-196	41		0.27	20	pg/g
PCB-197	3.4	J	0.18	20	pg/g
PCB-198/199	130	C	0.31	40	pg/g
PCB-200	8.3	J	0.29	20	pg/g
PCB-201	15	J	0.21	20	pg/g
PCB-202	29		0.23	20	pg/g
PCB-203	78		0.30	20	pg/g
PCB-204	0.98 U		0.21	20	pg/g
PCB-205	3.7	J	0.31	20	pg/g
PCB-206	40		0.31	20	pg/g
PCB-207	5.4	J ~~J Q~~ EMPC	0.19	20	pg/g
PCB-208	17	J	0.17	20	pg/g
PCB-209	15	J	0.22	20	pg/g
Total MoCB	4.8		0.31	20	pg/g
Total DiCB	75		1.8	20	pg/g
Total TrCB	650		0.56	20	pg/g
Total TeCB	5400		0.86	20	pg/g
Total PeCB	17000		1.2	20	pg/g
Total HxCB	11000		0.96	20	pg/g
Total HpCB	2400		0.32	20	pg/g
Total OcCB	400		0.31	20	pg/g
Total NoCB	63		0.31	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	**Work Order #....:**	MQN791AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	50	5.0 - 145
PCB-3L	54	5.0 - 145
PCB-4L	46	5.0 - 145
PCB-19L	53	5.0 - 145
PCB-37L	79	5.0 - 145
PCB-54L	48	5.0 - 145
PCB-77L	86	10 - 145
PCB-81L	86	10 - 145
PCB-104L	59	10 - 145
PCB-105L	83	10 - 145
PCB-114L	83	10 - 145
PCB-118L	83	10 - 145
PCB-123L	82	10 - 145
PCB-126L	87	10 - 145
PCB-155L	73	10 - 145
PCB-156L/157L	106	10 - 145
PCB-167L	104	10 - 145
PCB-169L	99	10 - 145
PCB-188L	88	10 - 145
PCB-189L	107	10 - 145
PCB-202L	94	10 - 145
PCB-205L	86	10 - 145
PCB-206L	84	10 - 145
PCB-208L	96	10 - 145
PCB-209L	82	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	78	5.0 - 145
PCB-178L	78	10 - 145
PCB-111L	83	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	**Work Order #....:**	MQN791AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN792AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	4.94
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-118	2400	B	2.6	9.9	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-118L	82	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-111L	80	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

4572

059

CH2M Hill Inc

Sample ID: **VWW06-FS05-0212**

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	**Work Order #....:**	MQN8A1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	1.9 U		0.34	20	pg/g
PCB-2	1.9 U		0.30	20	pg/g
PCB-3	1.1	J	0.27	20	pg/g
PCB-4	9.7 U		1.7	20	pg/g
PCB-5	9.7 U		1.5	20	pg/g
PCB-6	9.7 U		1.5	20	pg/g
PCB-7	9.7 U		1.5	20	pg/g
PCB-8	9.7 U		1.5	20	pg/g
PCB-9	9.7 U		1.7	20	pg/g
PCB-10	9.7 U		1.2	20	pg/g
PCB-11	8.2	J B	1.6	20	pg/g
PCB-12/13	19 U		1.6	39	pg/g
PCB-14	9.7 U		1.3	20	pg/g
PCB-15	9.7 U		1.4	20	pg/g
PCB-16	0.81	J ~~J Q~~ EMPC	0.30	20	pg/g
PCB-17	1.1	J	0.25	20	pg/g
PCB-18/30	2.0	J ~~C J B~~	0.21	39	pg/g
PCB-19	0.97 U		0.29	20	pg/g
PCB-20/28	6.6	J ~~C J B~~ MBL	0.34	39	pg/g
PCB-21/33	2.1	C J B	0.33	39	pg/g
PCB-22	1.2	J	0.36	20	pg/g
PCB-23	0.97 U		0.33	20	pg/g
PCB-24	0.97 U		0.19	20	pg/g
PCB-25	0.97 U		0.34	20	pg/g
PCB-26/29	0.82	J ~~C J Q~~ EMPC	0.33	39	pg/g
PCB-27	0.97 U		0.18	20	pg/g
PCB-31	5.0	J ~~J B~~ MBL	0.32	20	pg/g
PCB-32	1.3	J B	0.18	20	pg/g
PCB-34	0.97 U		0.34	20	pg/g
PCB-35	1.9 U		0.36	20	pg/g
PCB-36	0.97 U		0.32	20	pg/g
PCB-37	1.0	J B	0.33	20	pg/g
PCB-38	0.97 U		0.36	20	pg/g
PCB-39	0.97 U		0.32	20	pg/g
PCB-40/71	2.2	C J	0.41	39	pg/g
PCB-41	0.97 U		0.57	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	**Work Order #....:**	MQN8A1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	0.80	J ~~J Q~~ EMPC	0.46	20	pg/g
PCB-43	0.97 U		0.51	20	pg/g
PCB-45	0.97 U		0.52	20	pg/g
PCB-46	0.97 U		0.51	20	pg/g
PCB-44/47/65	19	J ~~C J B~~ MBL	0.41	59	pg/g
PCB-48	0.97 U		0.44	20	pg/g
PCB-49/69	12	C J B	0.36	39	pg/g
PCB-50/53	1.6	C J	0.42	39	pg/g
PCB-51	1.5	J ~~J Q~~ EMPC	0.39	20	pg/g
PCB-52	34	J B MBL	0.44	20	pg/g
PCB-54	0.97 U		0.18	20	pg/g
PCB-55	1.9 U		0.43	20	pg/g
PCB-56	2.2	J	0.44	20	pg/g
PCB-57	0.97 U		0.42	20	pg/g
PCB-58	0.97 U		0.41	20	pg/g
PCB-59/62/75	0.87	C J	0.32	59	pg/g
PCB-60	2.1	J	0.43	20	pg/g
PCB-61/70/74/76	24	C J B	0.41	78	pg/g
PCB-63	0.97 U		0.37	20	pg/g
PCB-64	4.5	J	0.30	20	pg/g
PCB-66	12	J	0.42	20	pg/g
PCB-67	0.97 U		0.40	20	pg/g
PCB-68	1.9 U	~~J J Q~~	0.38	20	pg/g
PCB-72	0.97 U		0.40	20	pg/g
PCB-73	0.97 U		0.33	20	pg/g
PCB-77	0.97 U		0.42	2.0	pg/g
PCB-78	0.97 U		0.45	20	pg/g
PCB-79	0.97 U		0.39	20	pg/g
PCB-80	0.97 U		0.37	20	pg/g
PCB-81	0.97 U		0.38	2.0	pg/g
PCB-82	0.97 U		0.59	20	pg/g
PCB-83	0.97 U		0.48	20	pg/g
PCB-84	4.6	J	0.56	20	pg/g
PCB-85/116/117	6.6	C J	0.40	59	pg/g
PCB-86/87/97/108/119/125	18	C J	0.43	120	pg/g
PCB-88/91	5.2	C J	0.48	39	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	**Work Order #....:**	MQN8A1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-89	0.97 U	0.53	20	pg/g
PCB-90/101/113	47 ~~C J B~~	0.44	59	pg/g
PCB-92	9.2 J	0.51	20	pg/g
PCB-93/100	1.9 U	0.47	39	pg/g
PCB-94	0.97 U	0.52	20	pg/g
PCB-95	26 J ~~B~~ MBL	0.49	20	pg/g
PCB-96	0.97 U	0.19	20	pg/g
PCB-98/102	1.9 U	0.50	39	pg/g
PCB-99	24	0.43	20	pg/g
PCB-103	0.97 U	0.45	20	pg/g
PCB-104	0.97 U	0.19	20	pg/g
PCB-105	13 ~~B~~	0.42	2.0	pg/g
PCB-106	1.9 U	0.46	20	pg/g
PCB-109	2.9 J ~~J Q~~ EMPC	0.30	20	pg/g
PCB-107/124	5.8 U	0.38	39	pg/g
PCB-110/115	33 ~~C J B~~	0.40	39	pg/g
PCB-111	0.97 U	0.36	20	pg/g
PCB-112	0.97 U	0.47	20	pg/g
PCB-114	0.97 U	0.35	2.0	pg/g
PCB-118	34 ~~B~~	0.33	2.0	pg/g
PCB-120	0.97 U	0.36	20	pg/g
PCB-121	0.97 U	0.36	20	pg/g
PCB-122	0.97 U	0.38	20	pg/g
PCB-123	0.97 U	0.36	2.0	pg/g
PCB-126	0.97 U	0.42	2.0	pg/g
PCB-127	0.97 U	0.38	20	pg/g
PCB-128/166	5.1 J ~~C J Q~~ EMPC	0.29	39	pg/g
PCB-129/138/163	40 ~~C J~~	0.29	59	pg/g
PCB-130	1.5 J ~~J Q~~ EMPC	0.39	20	pg/g
PCB-131	0.97 U	0.37	20	pg/g
PCB-132	4.2 J ~~J Q~~ EMPC	0.36	20	pg/g
PCB-133	0.97 U	0.36	20	pg/g
PCB-134/143	1.9 U	0.39	39	pg/g
PCB-135/151	6.0 ~~C J~~	0.33	39	pg/g
PCB-136	2.5 J ~~J Q~~ EMPC	0.26	20	pg/g
PCB-137	0.97 U	0.26	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	1.9 U		0.32	39	pg/g
PCB-141	4.4	J	0.42	20	pg/g
PCB-142	0.97 U		0.43	20	pg/g
PCB-144	0.97 U		0.33	20	pg/g
PCB-145	0.97 U		0.25	20	pg/g
PCB-146	7.5	J	0.26	20	pg/g
PCB-147/149	14	C J	0.32	39	pg/g
PCB-148	0.97 U		0.32	20	pg/g
PCB-150	0.97 U		0.24	20	pg/g
PCB-152	0.97 U		0.23	20	pg/g
PCB-153/168	45	C	0.25	39	pg/g
PCB-154	0.97 U		0.31	20	pg/g
PCB-155	0.97 U		0.24	20	pg/g
PCB-156/157	4.7	C	0.36	3.9	pg/g
PCB-158	3.2	J ~~JQ~~ EMPC	0.26	20	pg/g
PCB-159	0.97 U		0.32	20	pg/g
PCB-160	0.97 U		0.32	20	pg/g
PCB-161	0.97 U		0.32	20	pg/g
PCB-162	0.97 U	J	0.32	20	pg/g
PCB-164	0.97 U		0.33	20	pg/g
PCB-165	0.97 U		0.28	20	pg/g
PCB-167	2.3	J Q EMPC	0.28	2.0	pg/g
PCB-169	0.97 U		0.41	2.0	pg/g
PCB-170	9.2	J ~~JQ~~ EMPC	0.55	20	pg/g
PCB-171/173	1.9 U		0.56	39	pg/g
PCB-172	2.8	J ~~JQ~~ EMPC	0.53	20	pg/g
PCB-174	2.4	J ~~JQ~~ EMPC	0.64	20	pg/g
PCB-175	0.97 U		0.25	20	pg/g
PCB-176	0.97 U		0.18	20	pg/g
PCB-177	2.9	J	0.55	20	pg/g
PCB-178	1.6	J	0.26	20	pg/g
PCB-179	0.61	J ~~JQ~~ EMPC	0.20	20	pg/g
PCB-180/193	22	C J	0.44	39	pg/g
PCB-181	1.9 U		0.45	20	pg/g
PCB-182	0.97 U		0.25	20	pg/g
PCB-183	5.8	J	0.34	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.97 U		0.21	20	pg/g
PCB-185	1.9 U		0.58	20	pg/g
PCB-186	0.97 U		0.19	20	pg/g
PCB-187	15	J	0.22	20	pg/g
PCB-188	0.97 U		0.21	20	pg/g
PCB-189	0.97 U		0.35	2.0	pg/g
PCB-190	0.97 U		0.37	20	pg/g
PCB-191	0.97 U		0.40	20	pg/g
PCB-192	0.97 U		0.42	20	pg/g
PCB-194	3.2	J	0.32	20	pg/g
PCB-195	0.97 U		0.33	20	pg/g
PCB-196	3.9	J	0.31	20	pg/g
PCB-197	0.81	J	0.21	20	pg/g
PCB-198/199	12	C J	0.36	39	pg/g
PCB-200	1.9 U		0.33	20	pg/g
PCB-201	2.0	J ~~JQ~~ EMPC	0.25	20	pg/g
PCB-202	2.0	J ~~JQ~~ EMPC	0.25	20	pg/g
PCB-203	2.8	J ~~JQ~~ EMPC	0.35	20	pg/g
PCB-204	0.97 U		0.25	20	pg/g
PCB-205	0.97 U		0.27	20	pg/g
PCB-206	4.6	J ~~JQ~~ EMPC	0.55	20	pg/g
PCB-207	1.8	J	0.34	20	pg/g
PCB-208	3.8	J	0.32	20	pg/g
PCB-209	4.4	J	0.17	20	pg/g
Total MoCB	1.1		0.27	20	pg/g
Total DiCB	8.2		1.4	20	pg/g
Total TrCB	22		0.33	20	pg/g
Total TeCB	120		0.42	20	pg/g
Total PeCB	220		0.42	20	pg/g
Total HxCB	140		0.41	20	pg/g
Total HpCB	62		0.35	20	pg/g
Total OcCB	27		0.27	20	pg/g
Total NoCB	10		0.55	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	**Work Order #....:**	MQN8A1AD	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	40	5.0 - 145
PCB-3L	47	5.0 - 145
PCB-4L	39	5.0 - 145
PCB-19L	45	5.0 - 145
PCB-37L	68	5.0 - 145
PCB-54L	40	5.0 - 145
PCB-77L	72	10 - 145
PCB-81L	77	10 - 145
PCB-104L	52	10 - 145
PCB-105L	65	10 - 145
PCB-114L	73	10 - 145
PCB-118L	75	10 - 145
PCB-123L	73	10 - 145
PCB-126L	73	10 - 145
PCB-155L	68	10 - 145
PCB-156L/157L	92	10 - 145
PCB-167L	91	10 - 145
PCB-169L	79	10 - 145
PCB-188L	102	10 - 145
PCB-189L	108	10 - 145
PCB-202L	105	10 - 145
PCB-205L	80	10 - 145
PCB-206L	86	10 - 145
PCB-208L	101	10 - 145
PCB-209L	78	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	65	5.0 - 145
PCB-178L	71	10 - 145
PCB-111L	72	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-1	2.0 U	0.46	20	pg/g
PCB-2	2.0 U	0.44	20	pg/g
PCB-3	0.98 U	0.42	20	pg/g
PCB-4	9.8 U	2.8	20	pg/g
PCB-5	9.8 U	2.6	20	pg/g
PCB-6	9.8 U	2.7	20	pg/g
PCB-7	9.8 U	2.5	20	pg/g
PCB-8	9.8 U	2.7	20	pg/g
PCB-9	9.8 U	2.9	20	pg/g
PCB-10	9.8 U	2.0	20	pg/g
PCB-11	9.8 U	2.8	20	pg/g
PCB-12/13	20 U	2.8	40	pg/g
PCB-14	9.8 U	2.3	20	pg/g
PCB-15	9.8 U	2.5	20	pg/g
PCB-16	0.98 U	0.54	20	pg/g
PCB-17	0.98 U	0.44	20	pg/g
PCB-18/30	20 ~~1.6~~ U ~~CJB~~ MBL	0.38	40	pg/g
PCB-19	0.98 U	0.49	20	pg/g
PCB-20/28	4.2 J ~~CJQB~~ MBL	0.68	40	pg/g
PCB-21/33	2.0 U ~~CJB~~	0.65	40	pg/g
PCB-22	0.98 U	0.71	20	pg/g
PCB-23	0.98 U	0.65	20	pg/g
PCB-24	0.98 U	0.34	20	pg/g
PCB-25	0.98 U	0.67	20	pg/g
PCB-26/29	0.67 ~~C~~J	0.66	40	pg/g
PCB-27	0.98 U	0.33	20	pg/g
PCB-31	2.5 J ~~JB~~ MBL	0.64	20	pg/g
PCB-32	0.98 U	0.32	20	pg/g
PCB-34	0.98 U	0.68	20	pg/g
PCB-35	2.0 U	0.71	20	pg/g
PCB-36	0.98 U	0.62	20	pg/g
PCB-37	0.98 U	0.67	20	pg/g
PCB-38	0.98 U	0.71	20	pg/g
PCB-39	0.98 U	0.64	20	pg/g
PCB-40/71	0.84 J ~~CJQ~~ EMPC	0.54	40	pg/g
PCB-41	0.98 U	0.77	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-42	0.98 U	0.61	20	pg/g
PCB-43	0.98 U	0.68	20	pg/g
PCB-45	0.98 U	0.69	20	pg/g
PCB-46	0.98 U	0.68	20	pg/g
PCB-44/47/65	13 J ~~CJB~~ MBL	0.54	59	pg/g
PCB-48	0.98 U	0.58	20	pg/g
PCB-49/69	5.3 ~~CJB~~	0.48	40	pg/g
PCB-50/53	2.0 U	0.56	40	pg/g
PCB-51	1.6 J	0.52	20	pg/g
PCB-52	14 J ~~JB~~ MBL	0.59	20	pg/g
PCB-54	0.98 U	0.28	20	pg/g
PCB-55	2.0 U	0.56	20	pg/g
PCB-56	0.98 U	0.57	20	pg/g
PCB-57	0.98 U	0.53	20	pg/g
PCB-58	0.98 U	0.53	20	pg/g
PCB-59/62/75	2.9 U	0.42	59	pg/g
PCB-60	2.0 U	0.55	20	pg/g
PCB-61/70/74/76	15 ~~CJB~~	0.52	79	pg/g
PCB-63	0.98 U	0.48	20	pg/g
PCB-64	1.9 J	0.40	20	pg/g
PCB-66	8.0 J ~~JQ~~ EMPC	0.55	20	pg/g
PCB-67	0.98 U	0.51	20	pg/g
PCB-68	2.0 U	0.49	20	pg/g
PCB-72	0.98 U	0.51	20	pg/g
PCB-73	0.98 U	0.44	20	pg/g
PCB-77	0.98 U	0.55	2.0	pg/g
PCB-78	0.98 U	0.58	20	pg/g
PCB-79	0.98 U	0.50	20	pg/g
PCB-80	0.98 U	0.48	20	pg/g
PCB-81	0.98 U	0.52	2.0	pg/g
PCB-82	0.98 U	0.81	20	pg/g
PCB-83	0.98 U	0.66	20	pg/g
PCB-84	2.3 J ~~JQ~~ EMPC	0.76	20	pg/g
PCB-85/116/117	3.4 J ~~CJQ~~ EMPC	0.54	59	pg/g
PCB-86/87/97/108/119/125	9.8 ~~CJ~~	0.59	120	pg/g
PCB-88/91	2.2 ~~CJ~~	0.66	40	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	**Work Order #....:**	MQN8C1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	0.98 U		0.72	20	pg/g
PCB-90/101/113	28	~~C J B~~	0.59	59	pg/g
PCB-92	4.8	J ~~J Q~~ EMPC	0.69	20	pg/g
PCB-93/100	2.0 U		0.64	40	pg/g
PCB-94	0.98 U		0.71	20	pg/g
PCB-95	11	J ~~J B~~ MBL	0.66	20	pg/g
PCB-96	0.98 U		0.23	20	pg/g
PCB-98/102	2.0 U		0.67	40	pg/g
PCB-99	20	J	0.59	20	pg/g
PCB-103	0.98 U		0.61	20	pg/g
PCB-104	0.98 U		0.22	20	pg/g
PCB-105	13	~~B~~	0.58	2.0	pg/g
PCB-106	2.0 U		0.63	20	pg/g
PCB-109	2.1	J ~~J Q~~ EMPC	0.41	20	pg/g
PCB-107/124	5.9 U		0.51	40	pg/g
PCB-110/115	19	J ~~C J B~~ MBL	0.54	40	pg/g
PCB-111	0.98 U		0.49	20	pg/g
PCB-112	0.98 U		0.64	20	pg/g
PCB-114	0.98 U		0.49	2.0	pg/g
PCB-118	34	~~B~~	0.44	2.0	pg/g
PCB-120	0.98 U		0.49	20	pg/g
PCB-121	0.98 U		0.49	20	pg/g
PCB-122	0.98 U		0.52	20	pg/g
PCB-123	0.98 U		0.49	2.0	pg/g
PCB-126	0.98 U		0.58	2.0	pg/g
PCB-127	0.98 U		0.52	20	pg/g
PCB-128/166	6.5	~~C~~ J	0.51	40	pg/g
PCB-129/138/163	45	~~C~~	0.51	59	pg/g
PCB-130	0.98 U		0.69	20	pg/g
PCB-131	0.98 U		0.65	20	pg/g
PCB-132	3.2	J	0.64	20	pg/g
PCB-133	0.98 U		0.63	20	pg/g
PCB-134/143	2.0 U		0.69	40	pg/g
PCB-135/151	3.6	J ~~C J Q~~ EMPC	0.59	40	pg/g
PCB-136	0.98 U		0.45	20	pg/g
PCB-137	0.98 U		0.46	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	2.0 U		0.55	40	pg/g
PCB-141	3.6	J ~~J Q~~ EMPC	0.73	20	pg/g
PCB-142	0.98 U		0.75	20	pg/g
PCB-144	0.98 U		0.58	20	pg/g
PCB-145	0.98 U		0.44	20	pg/g
PCB-146	9.4	J	0.46	20	pg/g
PCB-147/149	8.2	C J	0.56	40	pg/g
PCB-148	0.98 U		0.56	20	pg/g
PCB-150	0.98 U		0.43	20	pg/g
PCB-152	0.98 U		0.41	20	pg/g
PCB-153/168	51	C	0.45	40	pg/g
PCB-154	0.98 U		0.54	20	pg/g
PCB-155	0.98 U		0.43	20	pg/g
PCB-156/157	5.7	C	0.47	4.0	pg/g
PCB-158	3.6	J ~~J Q~~ EMPC	0.45	20	pg/g
PCB-159	0.98 U		0.39	20	pg/g
PCB-160	0.98 U		0.57	20	pg/g
PCB-161	0.98 U		0.57	20	pg/g
PCB-162	0.98 U		0.39	20	pg/g
PCB-164	0.98 U		0.58	20	pg/g
PCB-165	0.98 U		0.49	20	pg/g
PCB-167	2.0	J ~~J Q~~ EMPC	0.35	2.0	pg/g
PCB-169	0.98 U		0.45	2.0	pg/g
PCB-170	13	J	0.59	20	pg/g
PCB-171/173	2.4	J ~~C J Q~~ EMPC	0.60	40	pg/g
PCB-172	3.3	J	0.56	20	pg/g
PCB-174	2.3	J ~~J Q~~ EMPC	0.69	20	pg/g
PCB-175	0.98 U		0.34	20	pg/g
PCB-176	0.98 U		0.25	20	pg/g
PCB-177	3.4	J	0.58	20	pg/g
PCB-178	0.98 U		0.35	20	pg/g
PCB-179	0.98 U		0.27	20	pg/g
PCB-180/193	26	C	0.47	40	pg/g
PCB-181	2.0 U		0.48	20	pg/g
PCB-182	0.98 U		0.34	20	pg/g
PCB-183	5.6	J ~~J Q~~ EMPC	0.36	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.98 U		0.28	20	pg/g
PCB-185	2.0 U		0.62	20	pg/g
PCB-186	0.98 U		0.26	20	pg/g
PCB-187	19	J	0.30	20	pg/g
PCB-188	0.98 U		0.30	20	pg/g
PCB-189	0.98 U		0.31	2.0	pg/g
PCB-190	0.98 U		0.39	20	pg/g
PCB-191	0.98 U		0.43	20	pg/g
PCB-192	0.98 U		0.44	20	pg/g
PCB-194	3.7	J	0.42	20	pg/g
PCB-195	0.98 U		0.43	20	pg/g
PCB-196	4.4	J	0.33	20	pg/g
PCB-197	1.2	J	0.22	20	pg/g
PCB-198/199	16	~~J~~ J	0.37	40	pg/g
PCB-200	2.0 U		0.35	20	pg/g
PCB-201	2.0	J ~~J Q~~ EMPC	0.26	20	pg/g
PCB-202	2.6	J	0.28	20	pg/g
PCB-203	3.2	J	0.37	20	pg/g
PCB-204	0.98 U		0.26	20	pg/g
PCB-205	0.98 U		0.31	20	pg/g
PCB-206	6.3	J	1.1	20	pg/g
PCB-207	2.0	J ~~J Q~~ EMPC	0.70	20	pg/g
PCB-208	5.0	J	0.64	20	pg/g
PCB-209	4.5	J ~~J Q~~ EMPC	0.34	20	pg/g
Total MoCB	0.42 U	U	0.42	20	pg/g
Total DiCB	2.5 U	U	2.5	20	pg/g
Total TrCB	11		0.67	20	pg/g
Total TeCB	60		0.54	20	pg/g
Total PeCB	150		0.58	20	pg/g
Total HxCB	140		0.45	20	pg/g
Total HpCB	75		0.30	20	pg/g
Total OcCB	33		0.31	20	pg/g
Total NoCB	13		1.1	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	**Work Order #....:**	MQN8C1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	50	5.0 - 145
PCB-3L	55	5.0 - 145
PCB-4L	47	5.0 - 145
PCB-19L	55	5.0 - 145
PCB-37L	82	5.0 - 145
PCB-54L	50	5.0 - 145
PCB-77L	87	10 - 145
PCB-81L	84	10 - 145
PCB-104L	65	10 - 145
PCB-105L	79	10 - 145
PCB-114L	88	10 - 145
PCB-118L	91	10 - 145
PCB-123L	89	10 - 145
PCB-126L	88	10 - 145
PCB-155L	82	10 - 145
PCB-156L/157L	111	10 - 145
PCB-167L	108	10 - 145
PCB-169L	105	10 - 145
PCB-188L	106	10 - 145
PCB-189L	122	10 - 145
PCB-202L	110	10 - 145
PCB-205L	96	10 - 145
PCB-206L	96	10 - 145
PCB-208L	113	10 - 145
PCB-209L	87	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	80	5.0 - 145
PCB-178L	86	10 - 145
PCB-111L	87	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	**Work Order #....:**	MQN8C1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	1.9 U		0.29	19	pg/g
PCB-2	1.9 U		0.27	19	pg/g
PCB-3	0.95 U		0.24	19	pg/g
PCB-4	9.5 U		1.5	19	pg/g
PCB-5	9.5 U		1.5	19	pg/g
PCB-6	9.5 U		1.5	19	pg/g
PCB-7	9.5 U		1.4	19	pg/g
PCB-8	9.5 U		1.5	19	pg/g
PCB-9	9.5 U		1.6	19	pg/g
PCB-10	9.5 U		0.98	19	pg/g
PCB-11	8.2	J B	1.6	19	pg/g
PCB-12/13	19 U		1.6	38	pg/g
PCB-14	9.5 U		1.3	19	pg/g
PCB-15	9.5 U		1.4	19	pg/g
PCB-16	0.95 U		0.35	19	pg/g
PCB-17	0.95 U		0.29	19	pg/g
PCB-18/30	1.1	C J B	0.24	38	pg/g
PCB-19	0.95 U		0.34	19	pg/g
PCB-20/28	3.8	J ~~C J B~~ MBL	0.44	38	pg/g
PCB-21/33	1.9 U	C J B	0.42	38	pg/g
PCB-22	1.1	J	0.46	19	pg/g
PCB-23	0.95 U		0.42	19	pg/g
PCB-24	0.95 U		0.22	19	pg/g
PCB-25	0.95 U		0.44	19	pg/g
PCB-26/29	0.78	C J	0.43	38	pg/g
PCB-27	0.95 U		0.21	19	pg/g
PCB-31	2.8	J ~~J B~~ MBL	0.42	19	pg/g
PCB-32	0.95 U		0.20	19	pg/g
PCB-34	0.95 U		0.44	19	pg/g
PCB-35	1.9 U		0.46	19	pg/g
PCB-36	0.95 U		0.40	19	pg/g
PCB-37	0.95 U		0.42	19	pg/g
PCB-38	0.95 U		0.46	19	pg/g
PCB-39	0.95 U		0.41	19	pg/g
PCB-40/71	1.0	C J	0.38	38	pg/g
PCB-41	0.95 U		0.54	19	pg/g

exclude BL

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	0.95 U		0.43	19	pg/g
PCB-43	0.95 U		0.47	19	pg/g
PCB-45	0.95 U		0.48	19	pg/g
PCB-46	0.95 U		0.48	19	pg/g
PCB-44/47/65	11	J ~~C J B~~ MBL	0.38	57	pg/g
PCB-48	0.95 U		0.41	19	pg/g
PCB-49/69	3.7	C J B	0.33	38	pg/g
PCB-50/53	1.9 U		0.39	38	pg/g
PCB-51	1.3	J	0.37	19	pg/g
PCB-52	12	J ~~J B~~ MBL	0.42	19	pg/g
PCB-54	0.95 U		0.15	19	pg/g
PCB-55	1.9 U		0.35	19	pg/g
PCB-56	0.95 U		0.36	19	pg/g
PCB-57	0.95 U		0.34	19	pg/g
PCB-58	0.95 U		0.33	19	pg/g
PCB-59/62/75	2.8 U		0.30	57	pg/g
PCB-60	1.9 U		0.35	19	pg/g
PCB-61/70/74/76	17	C J B	0.33	76	pg/g
PCB-63	0.95 U		0.30	19	pg/g
PCB-64	1.9	J Q	0.28	19	pg/g
PCB-66	10	J	0.34	19	pg/g
PCB-67	0.95 U		0.32	19	pg/g
PCB-68	1.9 U		0.31	19	pg/g
PCB-72	0.95 U		0.32	19	pg/g
PCB-73	0.95 U		0.31	19	pg/g
PCB-77	0.95 U		0.33	1.9	pg/g
PCB-78	0.95 U		0.36	19	pg/g
PCB-79	0.95 U		0.31	19	pg/g
PCB-80	0.95 U		0.30	19	pg/g
PCB-81	0.95 U		0.32	1.9	pg/g
PCB-82	0.95 U		0.62	19	pg/g
PCB-83	0.95 U		0.50	19	pg/g
PCB-84	0.95 U		0.58	19	pg/g
PCB-85/116/117	3.9	C J Q	0.41	57	pg/g
PCB-86/87/97/108/119/125	7.8	C J	0.45	110	pg/g
PCB-88/91	1.9 U		0.50	38	pg/g

exclude DL

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S, Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	0.95 U		0.55	19	pg/g
PCB-90/101/113	26	C J B	0.45	57	pg/g
PCB-92	4.6	J Q	0.53	19	pg/g
PCB-93/100	1.9 U		0.49	38	pg/g
PCB-94	0.95 U		0.54	19	pg/g
PCB-95	7.5	J ~~J B~~ MBL	0.51	19	pg/g
PCB-96	0.95 U		0.18	19	pg/g
PCB-98/102	1.9 U		0.52	38	pg/g
PCB-99	21		0.45	19	pg/g
PCB-103	0.95 U		0.47	19	pg/g
PCB-104	0.95 U		0.19	19	pg/g
PCB-105	14	~~B~~	0.38	1.9	pg/g
PCB-106	1.9 U		0.48	19	pg/g
PCB-109	3.2	J	0.32	19	pg/g
PCB-107/124	5.7 U		0.39	38	pg/g
PCB-110/115	12	J ~~C J B~~ MBL	0.41	38	pg/g
PCB-111	0.95 U		0.38	19	pg/g
PCB-112	0.95 U		0.49	19	pg/g
PCB-114	0.95 U		0.37	1.9	pg/g
PCB-118	39	~~B~~	0.35	1.9	pg/g
PCB-120	0.95 U		0.38	19	pg/g
PCB-121	0.95 U		0.38	19	pg/g
PCB-122	0.95 U		0.40	19	pg/g
PCB-123	0.95 U		0.38	1.9	pg/g
PCB-126	0.95 U		0.45	1.9	pg/g
PCB-127	0.95 U		0.40	19	pg/g
PCB-128/166	5.7	C J Q	0.24	38	pg/g
PCB-129/138/163	48	C J	0.25	57	pg/g
PCB-130	2.2	J Q	0.33	19	pg/g
PCB-131	0.95 U		0.31	19	pg/g
PCB-132	1.9	J	0.31	19	pg/g
PCB-133	0.95 U		0.30	19	pg/g
PCB-134/143	1.9 U		0.33	38	pg/g
PCB-135/151	3.3	C J	0.28	38	pg/g
PCB-136	0.95 U		0.22	19	pg/g
PCB-137	1.1	J Q	0.22	19	pg/g

exclude DL

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

KA 4/5/12

076

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	1.9 U		0.27	38	pg/g
PCB-141	4.8	J	0.35	19	pg/g
PCB-142	0.95 U		0.36	19	pg/g
PCB-144	0.95 U		0.28	19	pg/g
PCB-145	0.95 U		0.21	19	pg/g
PCB-146	9.4	J	0.22	19	pg/g
PCB-147/149	6.8	C J	0.27	38	pg/g
PCB-148	0.95 U		0.27	19	pg/g
PCB-150	0.95 U		0.21	19	pg/g
PCB-152	0.95 U		0.20	19	pg/g
PCB-153/168	50	C	0.21	38	pg/g
PCB-154	0.95 U		0.26	19	pg/g
PCB-155	0.95 U		0.21	19	pg/g
PCB-156/157	5.0	C	0.51	3.8	pg/g
PCB-158	4.7	J	0.22	19	pg/g
PCB-159	0.95 U		0.44	38	pg/g
PCB-160	0.95 U		0.27	19	pg/g
PCB-161	0.95 U		0.27	19	pg/g
PCB-162	0.95 U		0.44	19	pg/g
PCB-164	1.0	J	0.28	19	pg/g
PCB-165	0.95 U		0.23	19	pg/g
PCB-167	2.5	Q	0.38	1.9	pg/g
PCB-169	0.95 U		0.53	1.9	pg/g
PCB-170	15	J	0.41	19	pg/g
PCB-171/173	3.6	C J Q	0.42	38	pg/g
PCB-172	4.4	J Q	0.40	19	pg/g
PCB-174	2.5	J	0.48	19	pg/g
PCB-175	0.95 U		0.25	19	pg/g
PCB-176	0.95 U		0.18	19	pg/g
PCB-177	4.7	J	0.41	19	pg/g
PCB-178	2.3	J	0.26	19	pg/g
PCB-179	0.95 U		0.20	19	pg/g
PCB-180/193	32	C J	0.33	38	pg/g
PCB-181	1.9 U		0.34	19	pg/g
PCB-182	0.95 U		0.25	19	pg/g
PCB-183	7.1	J	0.25	19	pg/g

exclude DL

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

4572

077

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.95 U		0.20	19	pg/g
PCB-185	1.9 U		0.43	19	pg/g
PCB-186	0.95 U		0.19	19	pg/g
PCB-187	18	J	0.22	19	pg/g
PCB-188	0.95 U		0.20	19	pg/g
PCB-189	0.95 U		0.34	1.9	pg/g
PCB-190	1.0	J Q	0.27	19	pg/g
PCB-191	0.95 U		0.30	19	pg/g
PCB-192	0.95 U		0.31	19	pg/g
PCB-194	2.9	J Q	0.31	19	pg/g
PCB-195	0.95 U		0.32	19	pg/g
PCB-196	4.1	J Q	0.26	19	pg/g
PCB-197	0.83	J	0.17	19	pg/g
PCB-198/199	17	C J	0.30	38	pg/g
PCB-200	1.9 U		0.28	19	pg/g
PCB-201	2.6	J	0.21	19	pg/g
PCB-202	3.0	J Q	0.19	19	pg/g
PCB-203	3.7	J	0.29	19	pg/g
PCB-204	0.95 U		0.21	19	pg/g
PCB-205	0.95 U		0.31	19	pg/g
PCB-206	5.0	J Q	0.91	19	pg/g
PCB-207	2.0	J	0.54	19	pg/g
PCB-208	5.2	J	0.49	19	pg/g
PCB-209	5.3	J	0.22	19	pg/g
Total MoCB	0.24 U	U	0.24	19	pg/g
Total DiCB	8.2		1.4	19	pg/g
Total TrCB	11		0.42	19	pg/g
Total TeCB	57		0.33	19	pg/g
Total PeCB	140		0.44	19	pg/g
Total HxCB	150		0.52	19	pg/g
Total HpCB	91		0.34	19	pg/g
Total OcCB	34		0.31	19	pg/g
Total NoCB	12		0.90	19	pg/g

exclude DL

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

078

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-1L	46		5.0 - 145
PCB-3L	48		5.0 - 145
PCB-4L	41		5.0 - 145
PCB-19L	49		5.0 - 145
PCB-37L	77		5.0 - 145
PCB-54L	44		5.0 - 145
PCB-77L	82		10 - 145
PCB-81L	81		10 - 145
PCB-104L	55		10 - 145
PCB-105L	77		10 - 145
PCB-114L	80		10 - 145
PCB-118L	77		10 - 145
PCB-123L	78		10 - 145
PCB-126L	78		10 - 145
PCB-155L	71		10 - 145
PCB-156L/157L	95	C	10 - 145
PCB-167L	96		10 - 145
PCB-169L	86		10 - 145
PCB-188L	159	*	10 - 145
PCB-189L	156	*	10 - 145
PCB-202L	170	*	10 - 145
PCB-205L	104		10 - 145
PCB-206L	117		10 - 145
PCB-208L	151	*	10 - 145
PCB-209L	113		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	72	5.0 - 145
PCB-178L	74	10 - 145
PCB-111L	79	10 - 145

exclude DL

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

* Surrogate recovery is outside stated control limits.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS06-0112 DL

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	4.75
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-1	9.5 U	1.2	96	pg/g
PCB-2	9.5 U	1.2	96	pg/g
PCB-3	4.8 U	1.3	96	pg/g
PCB-4	48 U	7.0	96	pg/g
PCB-5	48 U	8.8	96	pg/g
PCB-6	48 U	9.0	96	pg/g
PCB-7	48 U	8.5	96	pg/g
PCB-8	48 U	9.0	96	pg/g
PCB-9	48 U	9.6	96	pg/g
PCB-10	48 U	5.3	96	pg/g
PCB-11	48 U	9.3	96	pg/g
PCB-12/13	95 U	9.3	190	pg/g
PCB-14	48 U	7.8	96	pg/g
PCB-15	48 U	8.8	96	pg/g
PCB-16	4.8 U	1.7	96	pg/g
PCB-17	4.8 U	1.4	96	pg/g
PCB-18/30	9.5 U	1.2	190	pg/g
PCB-19	4.8 U	1.3	96	pg/g
PCB-20/28	9.5 ~~6.7~~ U ~~CJB~~ MBL	1.2	190	pg/g
PCB-21/33	9.5 U	1.2	190	pg/g
PCB-22	4.8 U	1.3	96	pg/g
PCB-23	4.8 U	1.2	96	pg/g
PCB-24	4.8 U	1.1	96	pg/g
PCB-25	4.8 U	1.2	96	pg/g
PCB-26/29	9.5 U	1.2	190	pg/g
PCB-27	4.8 U	1.0	96	pg/g
PCB-31	4.8 ~~3.8~~ U ~~JQB~~ MBL	1.2	96	pg/g
PCB-32	4.8 U	0.98	96	pg/g
PCB-34	4.8 U	1.2	96	pg/g
PCB-35	9.5 U	1.3	96	pg/g
PCB-36	4.8 U	1.1	96	pg/g
PCB-37	4.8 U	1.4	96	pg/g
PCB-38	4.8 U	1.3	96	pg/g
PCB-39	4.8 U	1.2	96	pg/g
PCB-40/71	9.5 U	1.5	190	pg/g
PCB-41	4.8 U	2.2	96	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS06-0112 DL

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	4.75
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT			DL	LOQ	UNITS
PCB-42	4.8 U			1.7	96	pg/g
PCB-43	4.8 U			1.9	96	pg/g
PCB-45	4.8 U			2.0	96	pg/g
PCB-46	4.8 U			1.9	96	pg/g
PCB-44/47/65	14 ~~11~~	U	~~CJQB~~ MBL	1.5	290	pg/g
PCB-48	4.8 U			1.7	96	pg/g
PCB-49/69	9.5 ~~5.1~~	U	CJB MBL	1.4	190	pg/g
PCB-50/53	9.5 U			1.6	190	pg/g
PCB-51	4.8 U			1.5	96	pg/g
PCB-52	14	J	~~JB~~ MBL	1.7	96	pg/g
PCB-54	4.8 U			0.71	96	pg/g
PCB-55	9.5 U			1.7	96	pg/g
PCB-56	4.8 U			1.8	96	pg/g
PCB-57	4.8 U			1.6	96	pg/g
PCB-58	4.8 U			1.6	96	pg/g
PCB-59/62/75	14 U			1.2	290	pg/g
PCB-60	9.5 U			1.7	96	pg/g
PCB-61/70/74/76	19 ~~18~~	U	~~CJB~~ MBL	1.6	380	pg/g
PCB-63	4.8 U			1.5	96	pg/g
PCB-64	4.8 U			1.1	96	pg/g
PCB-66	7.7	J	~~JQ~~ EMPC	1.7	96	pg/g
PCB-67	4.8 U			1.6	96	pg/g
PCB-68	9.5 U			1.5	96	pg/g
PCB-72	4.8 U			1.6	96	pg/g
PCB-73	4.8 U			1.2	96	pg/g
PCB-77	4.8 U			1.7	9.6	pg/g
PCB-78	4.8 U			1.8	96	pg/g
PCB-79	4.8 U			1.5	96	pg/g
PCB-80	4.8 U			1.5	96	pg/g
PCB-81	4.8 U			1.6	9.6	pg/g
PCB-82	4.8 U			2.8	96	pg/g
PCB-83	4.8 U			2.2	96	pg/g
PCB-84	4.8 U			2.6	96	pg/g
PCB-85/116/117	14 U			1.9	290	pg/g
PCB-86/87/97/108/119/125	5.6	J	~~CJQ~~ EMPC	2.0	570	pg/g
PCB-88/91	9.5 U			2.2	190	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

JMC 4512

082

CH2M Hill Inc

Sample ID: VWW06-FS06-0112 DL

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	4.75
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	4.8 U		2.5	96	pg/g
PCB-90/101/113	25	~~CJB~~	2.0	290	pg/g
PCB-92	4.8 U		2.4	96	pg/g
PCB-93/100	9.5 U		2.2	190	pg/g
PCB-94	4.8 U		2.4	96	pg/g
PCB-95	7.6	J ~~JQB~~ MBL	2.3	96	pg/g
PCB-96	4.8 U		1.0	96	pg/g
PCB-98/102	9.5 U		2.3	190	pg/g
PCB-99	21	J ~~JQ~~ EMPC	2.0	96	pg/g
PCB-103	4.8 U		2.1	96	pg/g
PCB-104	4.8 U		0.88	96	pg/g
PCB-105	15	~~B~~	1.7	9.6	pg/g
PCB-106	9.5 U		2.1	96	pg/g
PCB-109	2.1	J ~~JQ~~ EMPC	1.4	96	pg/g
PCB-107/124	28 U		1.8	190	pg/g
PCB-110/115	12	J ~~CJB~~ MBL	1.8	190	pg/g
PCB-111	4.8 U		1.7	96	pg/g
PCB-112	4.8 U		2.2	96	pg/g
PCB-114	4.8 U		1.8	9.6	pg/g
PCB-118	39	~~B~~	1.7	9.6	pg/g
PCB-120	4.8 U		1.7	96	pg/g
PCB-121	4.8 U		1.7	96	pg/g
PCB-122	4.8 U		1.8	96	pg/g
PCB-123	4.8 U		1.8	9.6	pg/g
PCB-126	4.8 U		2.1	9.6	pg/g
PCB-127	4.8 U		1.8	96	pg/g
PCB-128/166	9.5 U		1.2	190	pg/g
PCB-129/138/163	48	~~CJ~~	1.3	290	pg/g
PCB-130	4.8 U		1.7	96	pg/g
PCB-131	4.8 U		1.6	96	pg/g
PCB-132	4.8 U		1.6	96	pg/g
PCB-133	4.8 U		1.5	96	pg/g
PCB-134/143	9.5 U		1.7	190	pg/g
PCB-135/151	9.5 U		1.4	1900	pg/g
PCB-136	4.8 U		1.1	96	pg/g
PCB-137	4.8 U		1.1	96	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS06-0112 DL

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D2AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	4.75
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10 47 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	9.5 U		1.4	190	pg/g
PCB-141	4.8 U		1.8	96	pg/g
PCB-142	4.8 U		1.8	96	pg/g
PCB-144	4.8 U		1.4	96	pg/g
PCB-145	4.8 U		1.1	96	pg/g
PCB-146	9.0	J	1.1	96	pg/g
PCB-147/149	7.9	~~C~~ J	1.4	190	pg/g
PCB-148	4.8 U		1.4	96	pg/g
PCB-150	4.8 U		1.1	96	pg/g
PCB-152	4.8 U		1.0	96	pg/g
PCB-153/168	50	~~C~~ J	1.1	190	pg/g
PCB-154	4.8 U		1.3	96	pg/g
PCB-155	4.8 U		1.1	96	pg/g
PCB-156/157	5.6	~~C~~ J	1.6	19	pg/g
PCB-158	4.8 U		1.1	96	pg/g
PCB-159	4.8 U		1.4	96	pg/g
PCB-160	4.8 U		1.4	96	pg/g
PCB-161	4.8 U		1.4	96	pg/g
PCB-162	4.8 U		1.4	96	pg/g
PCB-164	4.8 U		1.4	96	pg/g
PCB-165	4.8 U		1.2	96	pg/g
PCB-167	4.8 U		1.3	9.6	pg/g
PCB-169	4.8 U		1.6	9.6	pg/g
PCB-170	13	J	2.1	96	pg/g
PCB-171/173	9.5 U		2.1	190	pg/g
PCB-172	4.8 U		2.0	96	pg/g
PCB-174	4.8 U		2.4	96	pg/g
PCB-175	4.8 U		0.97	96	pg/g
PCB-176	4.8 U		0.71	96	pg/g
PCB-177	4.8 U		2.1	96	pg/g
PCB-178	4.8 U		1.0	96	pg/g
PCB-179	4.8 U		0.76	96	pg/g
PCB-180/193	27	~~C~~ J	1.7	190	pg/g
PCB-181	9.5 U		1.7	96	pg/g
PCB-182	4.8 U		0.98	96	pg/g
PCB-183	4.7	J ~~JQ~~ EMPC	1.3	96	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS06-0112 DL

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D2AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	4.75
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	4.8 U		0.79	96	pg/g
PCB-185	9.5 U		2.2	96	pg/g
PCB-186	4.8 U		0.73	96	pg/g
PCB-187	14	J	0.84	96	pg/g
PCB-188	4.8 U		0.92	96	pg/g
PCB-189	4.8 U		0.81	9.6	pg/g
PCB-190	4.8 U		1.4	96	pg/g
PCB-191	4.8 U		1.5	96	pg/g
PCB-192	4.8 U		1.6	96	pg/g
PCB-194	4.8 U		1.1	96	pg/g
PCB-195	4.8 U		1.2	96	pg/g
PCB-196	5.6	J ~~JQ~~ EMPC	1.1	96	pg/g
PCB-197	4.8 U		0.72	96	pg/g
PCB-198/199	17	~~C~~ J	1.2	190	pg/g
PCB-200	9.5 U		1.2	96	pg/g
PCB-201	2.0	J ~~JQ~~ EMPC	0.86	96	pg/g
PCB-202	4.3	J	1.0	96	pg/g
PCB-203	4.8 U		1.2	96	pg/g
PCB-204	4.8 U		0.87	96	pg/g
PCB-205	4.8 U		0.75	96	pg/g
PCB-206	4.8 U		3.2	96	pg/g
PCB-207	4.8 U		2.3	96	pg/g
PCB-208	4.8 U		2.3	96	pg/g
PCB-209	4.4	J ~~JQ~~ EMPC	0.79	96	pg/g
Total MoCB	1.3 U	U	1.3	96	pg/g
Total DiCB	8.8 U	U	8.8	96	pg/g
Total TrCB	11		1.4	96	pg/g
Total TeCB	55		1.7	96	pg/g
Total PeCB	130		2.1	96	pg/g
Total HxCB	120		1.6	96	pg/g
Total HpCB	58		0.81	96	pg/g
Total OcCB	28		0.75	96	pg/g
Total NoCB	3.2 U	U	3.2	96	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

4/5/12

085

CH2M Hill Inc

Sample ID: VWW06-FS06-0112 DL

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D2AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	4.75
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	48	5.0 - 145
PCB-3L	53	5.0 - 145
PCB-4L	43	5.0 - 145
PCB-19L	56	5.0 - 145
PCB-37L	74	5.0 - 145
PCB-54L	46	5.0 - 145
PCB-77L	75	10 - 145
PCB-81L	75	10 - 145
PCB-104L	61	10 - 145
PCB-105L	76	10 - 145
PCB-114L	74	10 - 145
PCB-118L	79	10 - 145
PCB-123L	77	10 - 145
PCB-126L	73	10 - 145
PCB-155L	75	10 - 145
PCB-156L/157L	101	10 - 145
PCB-167L	98	10 - 145
PCB-169L	98	10 - 145
PCB-188L	69	10 - 145
PCB-189L	90	10 - 145
PCB-202L	73	10 - 145
PCB-205L	78	10 - 145
PCB-206L	74	10 - 145
PCB-208L	77	10 - 145
PCB-209L	71	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	80	5.0 - 145
PCB-178L	76	10 - 145
PCB-111L	80	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS06-0112 DL

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D2AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	4.75
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-1	1.9 U	0.24	19	pg/g
PCB-2	3.9 J ~~J Q~~ EMPC	0.20	19	pg/g
PCB-3	1.3 J ~~J Q~~ EMPC	0.16	19	pg/g
PCB-4	9.6 U	0.79	19	pg/g
PCB-5	9.6 U	0.93	19	pg/g
PCB-6	9.6 U	0.95	19	pg/g
PCB-7	9.6 U	0.90	19	pg/g
PCB-8	9.6 U	0.94	19	pg/g
PCB-9	9.6 U	1.0	19	pg/g
PCB-10	9.6 U	0.51	19	pg/g
PCB-11	13 J B	0.98	19	pg/g
PCB-12/13	19 U	0.98	39	pg/g
PCB-14	9.6 U	0.82	19	pg/g
PCB-15	9.6 U	0.83	19	pg/g
PCB-16	0.70 J	0.24	19	pg/g
PCB-17	0.74 J ~~J Q~~ EMPC	0.20	19	pg/g
PCB-18/30	1.9 U ~~C J B~~ MBL	0.17	39	pg/g
PCB-19	0.96 U	0.26	19	pg/g
PCB-20/28	8.4 J ~~C J B~~ MBL	0.28	39	pg/g
PCB-21/33	1.8 C J B	0.27	39	pg/g
PCB-22	1.8 J ~~J Q~~ EMPC	0.30	19	pg/g
PCB-23	0.96 U	0.27	19	pg/g
PCB-24	0.96 U	0.15	19	pg/g
PCB-25	0.96 U	0.28	19	pg/g
PCB-26/29	1.2 J ~~C J Q~~ EMPC	0.28	39	pg/g
PCB-27	0.96 U	0.15	19	pg/g
PCB-31	6.4 J ~~J B~~ MBL	0.27	19	pg/g
PCB-32	0.96 ~~0.93~~ U ~~J B~~ MBL	0.14	19	pg/g
PCB-34	0.96 U	0.28	19	pg/g
PCB-35	1.9 U	0.30	19	pg/g
PCB-36	0.96 U	0.26	19	pg/g
PCB-37	1.1 J ~~J Q~~ EMPC	0.26	19	pg/g
PCB-38	0.96 U	0.30	19	pg/g
PCB-39	0.96 U	0.27	19	pg/g
PCB-40/71	2.1 J ~~C J Q~~ EMPC	0.18	39	pg/g
PCB-41	0.96 U	0.26	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	0.96 U	~~J Q~~	0.21	19	pg/g
PCB-43	0.96 U		0.23	19	pg/g
PCB-45	0.96 U		0.23	19	pg/g
PCB-46	0.96 U		0.23	19	pg/g
PCB-44/47/65	20 J	~~C J B~~ MBL	0.18	58	pg/g
PCB-48	0.76	J	0.20	19	pg/g
PCB-49/69	11 J	~~C J B~~ MBL	0.16	39	pg/g
PCB-50/53	1.1	C J	0.19	39	pg/g
PCB-51	1.9	J	0.18	19	pg/g
PCB-52	34	B	0.20	19	pg/g
PCB-54	0.96 U		0.11	19	pg/g
PCB-55	1.9 U		0.25	19	pg/g
PCB-56	4.3	J	0.26	19	pg/g
PCB-57	0.96 U		0.24	19	pg/g
PCB-58	0.96 U		0.24	19	pg/g
PCB-59/62/75	0.73 J	~~C J Q~~ EMPC	0.14	58	pg/g
PCB-60	3.5 J	~~J Q~~ EMPC	0.25	19	pg/g
PCB-61/70/74/76	44	C J B	0.24	77	pg/g
PCB-63	0.98	J	0.22	19	pg/g
PCB-64	4.8	J	0.14	19	pg/g
PCB-66	20		0.25	19	pg/g
PCB-67	0.96 U	~~J Q~~	0.23	19	pg/g
PCB-68	1.9 U	~~J Q~~	0.22	19	pg/g
PCB-72	0.69	J	0.24	19	pg/g
PCB-73	0.96 U		0.15	19	pg/g
PCB-77	2.0		0.24	1.9	pg/g
PCB-78	0.96 U		0.27	19	pg/g
PCB-79	0.96 U		0.23	19	pg/g
PCB-80	0.96 U		0.22	19	pg/g
PCB-81	0.96 U		0.23	1.9	pg/g
PCB-82	0.96 U		0.51	19	pg/g
PCB-83	2.4	J	0.41	19	pg/g
PCB-84	7.0	J	0.48	19	pg/g
PCB-85/116/117	11	C J	0.34	58	pg/g
PCB-86/87/97/108/119/125	34	C J	0.37	120	pg/g
PCB-88/91	6.6	C J	0.41	39	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	0.96 U		0.45	19	pg/g
PCB-90/101/113	90	C B	0.37	58	pg/g
PCB-92	16	J	0.43	19	pg/g
PCB-93/100	1.9 U	~~C J Q~~	0.40	39	pg/g
PCB-94	0.96 U		0.44	19	pg/g
PCB-95	35	B	0.41	19	pg/g
PCB-96	0.96 U		0.14	19	pg/g
PCB-98/102	1.9 U		0.42	39	pg/g
PCB-99	43		0.37	19	pg/g
PCB-103	0.96 U	~~J Q~~	0.38	19	pg/g
PCB-104	0.96 U		0.15	19	pg/g
PCB-105	20	B	0.31	1.9	pg/g
PCB-106	1.9 U		0.39	19	pg/g
PCB-109	4.5	J	0.26	19	pg/g
PCB-107/124	2.1	C J	0.32	39	pg/g
PCB-110/115	65	C B	0.34	39	pg/g
PCB-111	0.96 U		0.31	19	pg/g
PCB-112	0.96 U		0.40	19	pg/g
PCB-114	0.90	J	0.30	1.9	pg/g
PCB-118	60	B	0.29	1.9	pg/g
PCB-120	0.93	J	0.31	19	pg/g
PCB-121	0.96 U		0.31	19	pg/g
PCB-122	0.96 U		0.32	19	pg/g
PCB-123	0.91	J	0.30	1.9	pg/g
PCB-126	0.96 U		0.38	1.9	pg/g
PCB-127	0.96 U		0.32	19	pg/g
PCB-128/166	8.2	C J	0.25	39	pg/g
PCB-129/138/163	65	C	0.25	58	pg/g
PCB-130	4.1	J	0.34	19	pg/g
PCB-131	0.96 U		0.32	19	pg/g
PCB-132	7.8	J	0.31	19	pg/g
PCB-133	2.1	J	0.31	19	pg/g
PCB-134/143	1.3	C J	0.34	39	pg/g
PCB-135/151	15	C J	0.29	39	pg/g
PCB-136	4.8	J	0.22	19	pg/g
PCB-137	2.1	J	0.23	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	**Work Order #....:**	MQN8J1AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.96
Prep Date....:	02/14/12	**Analysis Date....:**	02/21/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.37 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	1.4	~~C~~ J	0.27	39	pg/g
PCB-141	9.2	J	0.36	19	pg/g
PCB-142	0.96 U		0.37	19	pg/g
PCB-144	2.2	J	0.29	19	pg/g
PCB-145	0.96 U		0.22	19	pg/g
PCB-146	13	J	0.23	19	pg/g
PCB-147/149	27	~~C~~ J	0.28	39	pg/g
PCB-148	0.96 U		0.28	19	pg/g
PCB-150	0.96 U		0.21	19	pg/g
PCB-152	0.96 U		0.20	19	pg/g
PCB-153/168	75	~~C~~	0.22	39	pg/g
PCB-154	2.0	J	0.27	19	pg/g
PCB-155	0.96 U		0.21	19	pg/g
PCB-156/157	6.2	~~C~~	0.30	3.9	pg/g
PCB-158	6.1	J	0.22	19	pg/g
PCB-159	0.96 U		0.25	19	pg/g
PCB-160	0.96 U		0.28	19	pg/g
PCB-161	0.96 U		0.28	19	pg/g
PCB-162	0.96 U	~~J Q~~	0.25	19	pg/g
PCB-164	2.6	J	0.29	19	pg/g
PCB-165	0.96 U		0.24	19	pg/g
PCB-167	3.3		0.22	1.9	pg/g
PCB-169	0.96 U		0.28	1.9	pg/g
PCB-170	16	J	0.26	19	pg/g
PCB-171/173	5.9	~~C~~ J	0.26	39	pg/g
PCB-172	4.1	J	0.24	19	pg/g
PCB-174	4.8	J	0.30	19	pg/g
PCB-175	0.86 J	~~J Q~~ EMPC	0.13	19	pg/g
PCB-176	0.96	J	0.093	19	pg/g
PCB-177	3.8 J	~~J Q~~ EMPC	0.25	19	pg/g
PCB-178	5.2	J	0.13	19	pg/g
PCB-179	3.1	J	0.099	19	pg/g
PCB-180/193	40	~~C~~	0.21	39	pg/g
PCB-181	1.9 U		0.21	19	pg/g
PCB-182	0.96 U		0.13	19	pg/g
PCB-183	10	J	0.16	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix.....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.66	J	0.10	19	pg/g
PCB-185	1.9 U		0.27	19	pg/g
PCB-186	0.96 U		0.096	19	pg/g
PCB-187	17	J	0.11	19	pg/g
PCB-188	1.4	J	0.11	19	pg/g
PCB-189	0.96 U		0.15	1.9	pg/g
PCB-190	0.96 U		0.17	19	pg/g
PCB-191	0.92	J	0.19	19	pg/g
PCB-192	0.96 U		0.19	19	pg/g
PCB-194	5.0	J	0.24	19	pg/g
PCB-195	0.96 U		0.24	19	pg/g
PCB-196	5.5	J	0.16	19	pg/g
PCB-197	1.5	J	0.11	19	pg/g
PCB-198/199	15	~~C~~ J	0.19	39	pg/g
PCB-200	1.9 U		0.17	19	pg/g
PCB-201	3.4	J	0.13	19	pg/g
PCB-202	7.2	J	0.14	19	pg/g
PCB-203	2.0	J	0.18	19	pg/g
PCB-204	0.96 U		0.13	19	pg/g
PCB-205	0.96 U		0.18	19	pg/g
PCB-206	1.9	J ~~J Q~~ EMPC	0.37	19	pg/g
PCB-207	0.96 U	~~J Q~~	0.24	19	pg/g
PCB-208	1.8	J ~~J Q~~ EMPC	0.22	19	pg/g
PCB-209	2.3	J	0.15	19	pg/g
Total MoCB	5.3		0.16	19	pg/g
Total DiCB	13		0.83	19	pg/g
Total TrCB	25		0.26	19	pg/g
Total TeCB	150		0.24	19	pg/g
Total PeCB	400		0.38	19	pg/g
Total HxCB	260		0.28	19	pg/g
Total HpCB	120		0.15	19	pg/g
Total OcCB	39		0.18	19	pg/g
Total NoCB	4.5		0.37	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.96
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	42	5.0 - 145
PCB-3L	43	5.0 - 145
PCB-4L	40	5.0 - 145
PCB-19L	37	5.0 - 145
PCB-37L	75	5.0 - 145
PCB-54L	46	5.0 - 145
PCB-77L	79	10 - 145
PCB-81L	79	10 - 145
PCB-104L	53	10 - 145
PCB-105L	76	10 - 145
PCB-114L	77	10 - 145
PCB-118L	73	10 - 145
PCB-123L	77	10 - 145
PCB-126L	73	10 - 145
PCB-155L	74	10 - 145
PCB-156L/157L	100	10 - 145
PCB-167L	101	10 - 145
PCB-169L	98	10 - 145
PCB-188L	91	10 - 145
PCB-189L	112	10 - 145
PCB-202L	100	10 - 145
PCB-205L	86	10 - 145
PCB-206L	92	10 - 145
PCB-208L	101	10 - 145
PCB-209L	86	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	71	5.0 - 145
PCB-178L	77	10 - 145
PCB-111L	79	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	**Work Order #....:**	MQN8J1AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.96
Prep Date....:	02/14/12	**Analysis Date....:**	02/21/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.37 g	**Analyst ID....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.0 U	~~J Q~~	0.24	20	pg/g
PCB-2	1.8	J	0.22	20	pg/g
PCB-3	1.3 J	~~J Q~~ EMPC	0.20	20	pg/g
PCB-4	9.9 U		1.2	20	pg/g
PCB-5	9.9 U		1.1	20	pg/g
PCB-6	9.9 U		1.1	20	pg/g
PCB-7	9.9 U		1.0	20	pg/g
PCB-8	9.9 U		1.1	20	pg/g
PCB-9	9.9 U		1.2	20	pg/g
PCB-10	9.9 U		0.79	20	pg/g
PCB-11	11 J	~~J Q~~ B EMPC	1.1	20	pg/g
PCB-12/13	20 U		1.1	40	pg/g
PCB-14	9.9 U		0.94	20	pg/g
PCB-15	9.9 U		0.96	20	pg/g
PCB-16	0.71	J	0.24	20	pg/g
PCB-17	0.86	J	0.19	20	pg/g
PCB-18/30	2.0 ~~1.9~~ U	~~C J B~~ MBL	0.16	40	pg/g
PCB-19	1.3	J	0.23	20	pg/g
PCB-20/28	8.9 J	~~C J B~~ MBL	0.31	40	pg/g
PCB-21/33	2.4	C J B	0.29	40	pg/g
PCB-22	1.6 J	~~J Q~~ EMPC	0.32	20	pg/g
PCB-23	0.99 U		0.29	20	pg/g
PCB-24	0.99 U		0.15	20	pg/g
PCB-25	0.99 U		0.30	20	pg/g
PCB-26/29	1.3	C J	0.30	40	pg/g
PCB-27	0.99 U		0.14	20	pg/g
PCB-31	7.2 J	J B MBL	0.29	20	pg/g
PCB-32	1.3 J	J Q B EMPC	0.14	20	pg/g
PCB-34	0.99 U		0.30	20	pg/g
PCB-35	2.0 U		0.32	20	pg/g
PCB-36	0.74 J	~~J Q~~ EMPC	0.28	20	pg/g
PCB-37	1.3	J B	0.28	20	pg/g
PCB-38	0.99 U		0.32	20	pg/g
PCB-39	0.99 U		0.29	20	pg/g
PCB-40/71	4.3	C J	0.35	40	pg/g
PCB-41	0.99 U		0.50	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	2.2	J	0.40	20	pg/g
PCB-43	0.99 U		0.44	20	pg/g
PCB-45	0.99 U		0.45	20	pg/g
PCB-46	0.99 U		0.44	20	pg/g
PCB-44/47/65	33	J ~~C J B~~ MGL	0.35	60	pg/g
PCB-48	1.5	J	0.38	20	pg/g
PCB-49/69	23	~~C~~ J ~~B~~	0.31	40	pg/g
PCB-50/53	2.1	~~C~~ J	0.36	40	pg/g
PCB-51	1.5	J ~~J Q~~ EMPC	0.34	20	pg/g
PCB-52	68	~~B~~	0.39	20	pg/g
PCB-54	0.66	J	0.13	20	pg/g
PCB-55	2.0 U		0.33	20	pg/g
PCB-56	5.7	J	0.34	20	pg/g
PCB-57	0.99 U		0.32	20	pg/g
PCB-58	0.99 U		0.32	20	pg/g
PCB-59/62/75	1.9	~~C~~ J	0.28	60	pg/g
PCB-60	4.9	J	0.33	20	pg/g
PCB-61/70/74/76	65	~~C~~ J ~~B~~	0.31	80	pg/g
PCB-63	1.2	J	0.29	20	pg/g
PCB-64	9.3	J	0.26	20	pg/g
PCB-66	28		0.33	20	pg/g
PCB-67	0.99 U	~~J Q~~	0.31	20	pg/g
PCB-68	1.7	J	0.29	20	pg/g
PCB-72	0.69	J ~~J Q~~ EMPC	0.31	20	pg/g
PCB-73	0.99 U		0.28	20	pg/g
PCB-77	1.7	J ~~J Q~~ EMPC	0.30	2.0	pg/g
PCB-78	0.99 U		0.35	20	pg/g
PCB-79	0.98	J ~~J Q~~ EMPC	0.30	20	pg/g
PCB-80	0.99 U		0.29	20	pg/g
PCB-81	0.99 U		0.31	2.0	pg/g
PCB-82	1.6	J	0.45	20	pg/g
PCB-83	6.3	J	0.36	20	pg/g
PCB-84	15	J	0.42	20	pg/g
PCB-85/116/117	12	J ~~C J Q~~ EMPC	0.30	60	pg/g
PCB-86/87/97/108/119/125	50	~~C~~ J	0.32	120	pg/g
PCB-88/91	13	~~C~~ J	0.36	40	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

JAC 4512

096

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	0.99 U		0.40	20	pg/g
PCB-90/101/113	130	~~C~~ B	0.33	60	pg/g
PCB-92	25		0.38	20	pg/g
PCB-93/100	2.0 U	~~C~~ J	0.35	40	pg/g
PCB-94	0.99 U		0.39	20	pg/g
PCB-95	70	~~B~~	0.36	20	pg/g
PCB-96	0.99 U		0.16	20	pg/g
PCB-98/102	1.8	~~C~~ J	0.37	40	pg/g
PCB-99	54		0.32	20	pg/g
PCB-103	1.1	J	0.34	20	pg/g
PCB-104	0.99 U		0.16	20	pg/g
PCB-105	17	~~B~~	0.28	2.0	pg/g
PCB-106	2.0 U		0.35	20	pg/g
PCB-109	4.8	J	0.23	20	pg/g
PCB-107/124	2.4	J ~~C J Q~~ EMPC	0.28	40	pg/g
PCB-110/115	95	~~C~~ B	0.30	40	pg/g
PCB-111	0.99 U		0.27	20	pg/g
PCB-112	0.99 U		0.35	20	pg/g
PCB-114	0.93	J ~~J Q~~ EMPC	0.27	2.0	pg/g
PCB-118	61	~~B~~	0.26	2.0	pg/g
PCB-120	0.99 U		0.27	20	pg/g
PCB-121	0.99 U		0.27	20	pg/g
PCB-122	0.99 U		0.28	20	pg/g
PCB-123	1.1	J	0.27	2.0	pg/g
PCB-126	0.99 U		0.33	2.0	pg/g
PCB-127	0.99 U		0.29	20	pg/g
PCB-128/166	7.3	~~C~~ J	0.21	40	pg/g
PCB-129/138/163	56	~~C~~ J	0.21	60	pg/g
PCB-130	4.1	J ~~J Q~~ EMPC	0.28	20	pg/g
PCB-131	0.99 U		0.26	20	pg/g
PCB-132	11	J	0.26	20	pg/g
PCB-133	1.8	J	0.26	20	pg/g
PCB-134/143	1.3	J ~~C J Q~~ EMPC	0.28	40	pg/g
PCB-135/151	18	~~C~~ J	0.24	40	pg/g
PCB-136	8.1	J	0.18	20	pg/g
PCB-137	1.4	J ~~J Q~~ EMPC	0.19	20	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

4512

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix.....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	1.0	J ~~C J Q~~ EMPC	0.23	40	pg/g
PCB-141	9.2	J	0.30	20	pg/g
PCB-142	0.99 U		0.31	20	pg/g
PCB-144	2.4	J	0.24	20	pg/g
PCB-145	0.99 U		0.18	20	pg/g
PCB-146	11	J	0.19	20	pg/g
PCB-147/149	40	C	0.23	40	pg/g
PCB-148	0.99 U		0.23	20	pg/g
PCB-150	0.99 U		0.18	20	pg/g
PCB-152	0.99 U		0.17	20	pg/g
PCB-153/168	63	C	0.18	40	pg/g
PCB-154	1.5	J ~~J Q~~ EMPC	0.22	20	pg/g
PCB-155	0.99 U		0.17	20	pg/g
PCB-156/157	5.3	C	0.38	4.0	pg/g
PCB-158	4.9	J	0.18	20	pg/g
PCB-159	0.99 U		0.32	20	pg/g
PCB-160	0.99 U		0.23	20	pg/g
PCB-161	0.99 U		0.23	20	pg/g
PCB-162	0.97	J ~~J Q~~ EMPC	0.32	20	pg/g
PCB-164	2.5	J ~~J Q~~ EMPC	0.24	20	pg/g
PCB-165	0.99 U		0.20	20	pg/g
PCB-167	2.7	J C EMPC	0.28	2.0	pg/g
PCB-169	0.99 U		0.39	2.0	pg/g
PCB-170	12	J	0.27	20	pg/g
PCB-171/173	3.6	C J	0.27	40	pg/g
PCB-172	3.6	J	0.26	20	pg/g
PCB-174	7.3	J	0.31	20	pg/g
PCB-175	0.99 U		0.25	20	pg/g
PCB-176	0.91	J	0.18	20	pg/g
PCB-177	6.2	J	0.26	20	pg/g
PCB-178	4.5	J	0.26	20	pg/g
PCB-179	3.2	J	0.19	20	pg/g
PCB-180/193	30	C J	0.21	40	pg/g
PCB-181	2.0 U		0.22	20	pg/g
PCB-182	0.99 U		0.25	20	pg/g
PCB-183	7.6	J	0.16	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	**Work Order #....:**	MQN8K1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date....:	02/14/12	**Analysis Date....:**	02/21/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.06 g	**Analyst ID....:**	Grandfield S Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.62	J	0.20	20	pg/g
PCB-185	2.0 U		0.28	20	pg/g
PCB-186	0.99 U		0.19	20	pg/g
PCB-187	20	J	0.21	20	pg/g
PCB-188	1.3	J ~~JQ~~ EMPC	0.21	20	pg/g
PCB-189	0.99 U		0.21	2.0	pg/g
PCB-190	0.99 U		0.18	20	pg/g
PCB-191	0.99 U		0.19	20	pg/g
PCB-192	0.99 U		0.20	20	pg/g
PCB-194	2.6	J ~~JQ~~ EMPC	0.24	20	pg/g
PCB-195	0.99 U		0.25	20	pg/g
PCB-196	4.3	J	0.19	20	pg/g
PCB-197	1.4	J	0.12	20	pg/g
PCB-198/199	16	~~C~~ J	0.22	40	pg/g
PCB-200	2.0 U		0.20	20	pg/g
PCB-201	3.4	J	0.15	20	pg/g
PCB-202	6.2	J	0.15	20	pg/g
PCB-203	1.5	J ~~JQ~~ EMPC	0.21	20	pg/g
PCB-204	0.99 U		0.15	20	pg/g
PCB-205	0.99 U		0.22	20	pg/g
PCB-206	3.1	J ~~JQ~~ EMPC	0.82	20	pg/g
PCB-207	0.99 U		0.50	20	pg/g
PCB-208	1.8	J ~~JQ~~ EMPC	0.45	20	pg/g
PCB-209	2.0 U	J	0.18	20	pg/g
Total MoCB	4.0		0.20	20	pg/g
Total DiCB	11		0.96	20	pg/g
Total TrCB	30		0.28	20	pg/g
Total TeCB	260		0.30	20	pg/g
Total PeCB	570		0.33	20	pg/g
Total HxCB	250		0.39	20	pg/g
Total HpCB	99		0.21	20	pg/g
Total OcCB	35		0.22	20	pg/g
Total NoCB	4.9		0.82	20	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

099

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	**Work Order #....:**	MQN8K1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date....:	02/14/12	**Analysis Date....:**	02/21/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.06 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	48	5.0 - 145
PCB-3L	47	5.0 - 145
PCB-4L	43	5.0 - 145
PCB-19L	49	5.0 - 145
PCB-37L	82	5.0 - 145
PCB-54L	47	5.0 - 145
PCB-77L	88	10 - 145
PCB-81L	86	10 - 145
PCB-104L	59	10 - 145
PCB-105L	82	10 - 145
PCB-114L	84	10 - 145
PCB-118L	81	10 - 145
PCB-123L	83	10 - 145
PCB-126L	84	10 - 145
PCB-155L	80	10 - 145
PCB-156L/157L	105	10 - 145
PCB-167L	106	10 - 145
PCB-169L	94	10 - 145
PCB-188L	124	10 - 145
PCB-189L	127	10 - 145
PCB-202L	132	10 - 145
PCB-205L	90	10 - 145
PCB-206L	99	10 - 145
PCB-208L	121	10 - 145
PCB-209L	92	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	75	5.0 - 145
PCB-178L	85	10 - 145
PCB-111L	87	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC)

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.7	J ~~JQ~~ EMPC	0.42	20	pg/g
PCB-2	3.5	J	0.41	20	pg/g
PCB-3	1.1	J ~~JQ~~ EMPC	0.39	20	pg/g
PCB-4	9.9	J ~~JQ~~ EMPC	2.0	20	pg/g
PCB-5	9.8 U		2.3	20	pg/g
PCB-6	9.8 U		2.3	20	pg/g
PCB-7	9.8 U		2.2	20	pg/g
PCB-8	37		2.3	20	pg/g
PCB-9	9.8 U		2.5	20	pg/g
PCB-10	9.8 U		1.4	20	pg/g
PCB-11	71		2.4	20	pg/g
PCB-12/13	20 U		2.4	39	pg/g
PCB-14	9.8 U		2.0	20	pg/g
PCB-15	10	J ~~JQ~~ EMPC	2.1	20	pg/g
PCB-16	10	J	0.46	20	pg/g
PCB-17	28	~~B~~	0.37	20	pg/g
PCB-18/30	62	~~C B~~	0.32	39	pg/g
PCB-19	11	J	0.46	20	pg/g
PCB-20/28	320	~~C B~~	0.63	39	pg/g
PCB-21/33	93	~~C B~~	0.60	39	pg/g
PCB-22	58	~~B~~	0.66	20	pg/g
PCB-23	3.3	J ~~JQ~~ EMPC	0.61	20	pg/g
PCB-24	0.98 U		0.29	20	pg/g
PCB-25	23		0.63	20	pg/g
PCB-26/29	48	~~C~~	0.61	39	pg/g
PCB-27	6.7	J	0.28	20	pg/g
PCB-31	220	~~B~~	0.59	20	pg/g
PCB-32	71		0.27	20	pg/g
PCB-34	0.98 U		0.63	20	pg/g
PCB-35	2.0 U	~~JQ~~	0.66	20	pg/g
PCB-36	20		0.58	20	pg/g
PCB-37	33		0.57	20	pg/g
PCB-38	0.98 U		0.66	20	pg/g
PCB-39	0.98 U		0.59	20	pg/g
PCB-40/71	200	~~C~~	0.51	39	pg/g
PCB-41	0.98 U		0.72	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	78		0.57	20	pg/g
PCB-43	10	J	0.64	20	pg/g
PCB-45	26		0.65	20	pg/g
PCB-46	10	J	0.64	20	pg/g
PCB-44/47/65	940	C B	0.51	59	pg/g
PCB-48	43		0.55	20	pg/g
PCB-49/69	870	C	0.45	39	pg/g
PCB-50/53	110	C B	0.52	39	pg/g
PCB-51	40		0.49	20	pg/g
PCB-54	2.0	J	0.22	20	pg/g
PCB-55	2.0 U		1.2	20	pg/g
PCB-56	280		1.2	20	pg/g
PCB-57	78		1.2	20	pg/g
PCB-58	1.1 U		1.1	20	pg/g
PCB-59/62/75	63	C	0.40	59	pg/g
PCB-60	160		1.2	20	pg/g
PCB-61/70/74/76	2600	C B	1.1	79	pg/g
PCB-63	53		1.0	20	pg/g
PCB-64	350	B	0.37	20	pg/g
PCB-66	1200	B	1.2	20	pg/g
PCB-67	29		1.1	20	pg/g
PCB-68	18	J	1.1	20	pg/g
PCB-72	29		1.1	20	pg/g
PCB-73	0.98 U		0.41	20	pg/g
PCB-77	52		1.1	2.0	pg/g
PCB-78	1.3 U		1.3	20	pg/g
PCB-79	71		1.1	20	pg/g
PCB-80	1.0 U		1.0	20	pg/g
PCB-81	1.1 U		1.1	2.0	pg/g
PCB-82	160		2.0	20	pg/g
PCB-83	1.7 U		1.7	20	pg/g
PCB-84	530		1.9	20	pg/g
PCB-85/116/117	800	C	1.4	59	pg/g
PCB-86/87/97/108/119/125	2500	C	1.5	120	pg/g
PCB-88/91	470	C	1.7	39	pg/g
PCB-89	14	J	1.8	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-92	980		1.7	20	pg/g
PCB-93/100	29	~~C~~ J	1.6	39	pg/g
PCB-94	8.8	J	1.8	20	pg/g
PCB-96	5.8	J	0.18	20	pg/g
PCB-98/102	77	~~C~~	1.7	39	pg/g
PCB-103	31		1.5	20	pg/g
PCB-104	0.98 U		0.21	20	pg/g
PCB-105	1600	~~B~~	1.2	2.0	pg/g
PCB-106	2.0 U		1.6	20	pg/g
PCB-109	380		1.0	20	pg/g
PCB-107/124	200	~~C~~	1.3	39	pg/g
PCB-111	1.2 U		1.2	20	pg/g
PCB-112	1.6 U		1.6	20	pg/g
PCB-114	120		1.3	2.0	pg/g
PCB-120	22		1.2	20	pg/g
PCB-121	1.4	J ~~JQ~~ EMPC	1.2	20	pg/g
PCB-122	61		1.3	20	pg/g
PCB-123	64		1.2	2.0	pg/g
PCB-126	13	J FD	1.4	2.0	pg/g
PCB-127	7.6	J ~~JQ~~ EMPC	1.3	20	pg/g
PCB-128/166	750	~~C~~	0.44	39	pg/g
PCB-129/138/163	5200	~~C~~ ~~B~~	0.45	59	pg/g
PCB-130	320		0.60	20	pg/g
PCB-131	19	J ~~JQ~~ EMPC	0.56	20	pg/g
PCB-132	920		0.55	20	pg/g
PCB-133	74		0.54	20	pg/g
PCB-134/143	130	~~C~~	0.60	39	pg/g
PCB-135/151	830	~~C~~	0.51	39	pg/g
PCB-136	290		0.39	20	pg/g
PCB-137	220		0.40	20	pg/g
PCB-139/140	95	~~C~~	0.48	39	pg/g
PCB-141	670		0.64	20	pg/g
PCB-142	0.98 U		0.65	20	pg/g
PCB-144	120		0.50	20	pg/g
PCB-145	1.1	J ~~JQ~~ EMPC	0.38	20	pg/g
PCB-146	650		0.40	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-147/149	2700	C B	0.49	39	pg/g
PCB-148	3.6	J	0.49	20	pg/g
PCB-150	3.7	J	0.37	20	pg/g
PCB-152	1.9	J	0.36	20	pg/g
PCB-154	56		0.47	20	pg/g
PCB-155	0.98 U		0.41	20	pg/g
PCB-156/157	830	C	1.4	3.9	pg/g
PCB-158	590		0.39	20	pg/g
PCB-159	6.3	J	1.2	20	pg/g
PCB-160	0.98 U		0.49	20	pg/g
PCB-161	0.98 U		0.49	20	pg/g
PCB-162	35		1.2	20	pg/g
PCB-164	310		0.51	20	pg/g
PCB-165	1.2	J ~~JQ~~ EMPC	0.42	20	pg/g
PCB-167	280		0.97	2.0	pg/g
PCB-169	1.3 U		1.3	2.0	pg/g
PCB-170	510		0.94	20	pg/g
PCB-171/173	180	C	0.97	39	pg/g
PCB-172	100		0.90	20	pg/g
PCB-174	360		1.1	20	pg/g
PCB-175	15	J	0.29	20	pg/g
PCB-176	25		0.21	20	pg/g
PCB-177	300		0.94	20	pg/g
PCB-178	82		0.30	20	pg/g
PCB-179	100		0.23	20	pg/g
PCB-180/193	960	C	0.76	39	pg/g
PCB-181	13	J	0.77	20	pg/g
PCB-182	5.2	J	0.29	20	pg/g
PCB-183	230		0.58	20	pg/g
PCB-184	1.2	J	0.24	20	pg/g
PCB-185	31	J FD	0.99	20	pg/g
PCB-186	0.98 U		0.22	20	pg/g
PCB-187	540		0.25	20	pg/g
PCB-188	3.1	J	0.27	20	pg/g
PCB-189	19		0.29	2.0	pg/g
PCB-190	79		0.63	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-191	24		0.69	20	pg/g
PCB-192	0.98 U		0.72	20	pg/g
PCB-194	79		0.44	20	pg/g
PCB-195	31		0.46	20	pg/g
PCB-196	48		0.27	20	pg/g
PCB-197	5.6	J	0.18	20	pg/g
PCB-198/199	160	~~J~~	0.31	39	pg/g
PCB-200	7.2	J	0.29	20	pg/g
PCB-201	17	J	0.22	20	pg/g
PCB-202	36		0.25	20	pg/g
PCB-203	75		0.31	20	pg/g
PCB-204	0.98 U		0.22	20	pg/g
PCB-205	2.8	J ~~J Q~~ EMPC	0.30	20	pg/g
PCB-206	33		0.95	20	pg/g
PCB-207	5.8	J	0.64	20	pg/g
PCB-208	18	J	0.62	20	pg/g
PCB-209	13	J	0.21	20	pg/g
Total MoCB	7.4		0.39	20	pg/g
Total DiCB	130		2.1	20	pg/g
Total TrCB	1000		0.57	20	pg/g
Total TeCB	9800		1.1	20	pg/g
Total PeCB	31000		1.4	20	pg/g
Total HxCB	19000		1.3	20	pg/g
Total HpCB	3600		0.29	20	pg/g
Total OcCB	460		0.30	20	pg/g
Total NoCB	57		0.95	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	**Work Order #....:**	MQN8L1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.16 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	48	5.0 - 145
PCB-3L	53	5.0 - 145
PCB-4L	42	5.0 - 145
PCB-19L	48	5.0 - 145
PCB-37L	71	5.0 - 145
PCB-54L	43	5.0 - 145
PCB-77L	78	10 - 145
PCB-81L	77	10 - 145
PCB-104L	53	10 - 145
PCB-105L	80	10 - 145
PCB-114L	76	10 - 145
PCB-118L	78	10 - 145
PCB-123L	77	10 - 145
PCB-126L	82	10 - 145
PCB-155L	67	10 - 145
PCB-156L/157L	104	10 - 145
PCB-167L	100	10 - 145
PCB-169L	101	10 - 145
PCB-188L	73	10 - 145
PCB-189L	96	10 - 145
PCB-202L	79	10 - 145
PCB-205L	85	10 - 145
PCB-206L	81	10 - 145
PCB-208L	83	10 - 145
PCB-209L	76	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	69	5.0 - 145
PCB-178L	74	10 - 145
PCB-111L	74	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	**Work Order #....:**	MQN8L1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.16 g	**Analyst ID....:**	Sylvia H. Krenn		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result

Q Estimated maximum possible concentration (EMPC)

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	4.92
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-52	2400	B	1.5	98	pg/g
PCB-90/101/113	5900	C B	4.0	300	pg/g
PCB-95	2500	B	4.4	98	pg/g
PCB-99	3100		3.9	98	pg/g
PCB-110/115	6100	C B	3.6	200	pg/g
PCB-118	5600	B	3.1	9.8	pg/g
PCB-153/168	4100	C	1.3	200	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-54L	46		5.0 - 145
PCB-77L	82		10 - 145
PCB-81L	79		10 - 145
PCB-104L	54		10 - 145
PCB-105L	76		10 - 145
PCB-114L	77		10 - 145
PCB-118L	81		10 - 145
PCB-123L	79		10 - 145
PCB-126L	82		10 - 145
PCB-155L	63		10 - 145
PCB-156L/157L	103	C	10 - 145
PCB-167L	102		10 - 145
PCB-169L	103		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	75	5.0 - 145
PCB-178L	75	10 - 145
PCB-111L	71	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	3.1	J	0.19	20	pg/g
PCB-2	4.1	J	0.18	20	pg/g
PCB-3	1.2	J ~~J Q~~ EMPC	0.17	20	pg/g
PCB-4	8.7	J ~~J Q~~ EMPC	0.92	20	pg/g
PCB-5	9.9 U		0.89	20	pg/g
PCB-6	11	J	0.90	20	pg/g
PCB-7	9.9 U		0.85	20	pg/g
PCB-8	39		0.90	20	pg/g
PCB-9	9.9 U		0.96	20	pg/g
PCB-10	9.9 U		0.57	20	pg/g
PCB-11	72		0.93	20	pg/g
PCB-12/13	20 U	~~C J Q~~	0.93	40	pg/g
PCB-14	9.9 U		0.78	20	pg/g
PCB-15	9.1	J ~~J Q~~ EMPC	0.76	20	pg/g
PCB-16	11	J	0.21	20	pg/g
PCB-17	32	~~B~~	0.17	20	pg/g
PCB-18/30	64	~~C~~ ~~B~~	0.14	40	pg/g
PCB-19	11	J	0.24	20	pg/g
PCB-20/28	350	~~C~~ ~~B~~	0.41	40	pg/g
PCB-21/33	100	~~C~~ ~~B~~	0.39	40	pg/g
PCB-22	63	~~B~~	0.42	20	pg/g
PCB-23	0.99 U		0.39	20	pg/g
PCB-24	0.99 U		0.13	20	pg/g
PCB-25	26		0.40	20	pg/g
PCB-26/29	54	~~C~~	0.39	40	pg/g
PCB-27	7.5	J	0.13	20	pg/g
PCB-31	250	~~B~~	0.38	20	pg/g
PCB-32	76		0.12	20	pg/g
PCB-34	3.6	J	0.40	20	pg/g
PCB-35	2.0 U	~~J Q~~	0.42	20	pg/g
PCB-36	26		0.37	20	pg/g
PCB-37	36		0.34	20	pg/g
PCB-38	0.99 U		0.42	20	pg/g
PCB-39	1.6	J	0.38	20	pg/g
PCB-40/71	210	~~C~~	0.21	40	pg/g
PCB-41	0.99 U		0.30	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	79		0.24	20	pg/g
PCB-43	13	J	0.27	20	pg/g
PCB-45	22		0.27	20	pg/g
PCB-46	10	J	0.27	20	pg/g
PCB-44/47/65	980	C B	0.22	60	pg/g
PCB-48	44		0.23	20	pg/g
PCB-49/69	910	C	0.19	40	pg/g
PCB-50/53	110	C B	0.22	40	pg/g
PCB-51	41		0.21	20	pg/g
PCB-54	2.2	J	0.085	20	pg/g
PCB-55	2.0 U		0.63	20	pg/g
PCB-56	300		0.64	20	pg/g
PCB-57	0.99 U		0.60	20	pg/g
PCB-58	0.99 U		0.60	20	pg/g
PCB-59/62/75	64	C	0.17	60	pg/g
PCB-60	170		0.62	20	pg/g
PCB-61/70/74/76	2800	C B	0.59	80	pg/g
PCB-63	56		0.54	20	pg/g
PCB-64	360	B	0.16	20	pg/g
PCB-66	1300	B	0.61	20	pg/g
PCB-67	32		0.58	20	pg/g
PCB-68	19	J	0.55	20	pg/g
PCB-72	24		0.58	20	pg/g
PCB-73	0.99 U		0.17	20	pg/g
PCB-77	53		0.56	2.0	pg/g
PCB-78	0.99 U		0.65	20	pg/g
PCB-79	71		0.56	20	pg/g
PCB-80	0.99 U		0.54	20	pg/g
PCB-81	0.99 U		0.55	2.0	pg/g
PCB-82	170		1.3	20	pg/g
PCB-83	1.1 U		1.1	20	pg/g
PCB-84	560		1.3	20	pg/g
PCB-85/116/117	860	C	0.90	60	pg/g
PCB-86/87/97/108/119/125	2700	C	0.97	120	pg/g
PCB-88/91	510	C	1.1	40	pg/g
PCB-89	15	J	1.2	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-92	1000		1.1	20	pg/g
PCB-93/100	30	C J	1.1	40	pg/g
PCB-94	9.1	J	1.2	20	pg/g
PCB-96	5.7	J	0.086	20	pg/g
PCB-98/102	82	C	1.1	40	pg/g
PCB-103	33		1.0	20	pg/g
PCB-104	0.57	J J Q EMPC	0.096	20	pg/g
PCB-105	1800	B	0.79	2.0	pg/g
PCB-106	2.0 U		1.0	20	pg/g
PCB-109	400		0.68	20	pg/g
PCB-107/124	220	C	0.85	40	pg/g
PCB-111	5.4	J	0.82	20	pg/g
PCB-112	1.1 U		1.1	20	pg/g
PCB-114	120		0.83	2.0	pg/g
PCB-120	24		0.82	20	pg/g
PCB-121	1.4	J	0.81	20	pg/g
PCB-122	58		0.86	20	pg/g
PCB-123	71		0.81	2.0	pg/g
PCB-126	8.5	J FD	0.88	2.0	pg/g
PCB-127	8.0	J	0.86	20	pg/g
PCB-128/166	840	C	0.37	40	pg/g
PCB-129/138/163	5600	C B	0.38	60	pg/g
PCB-130	360		0.50	20	pg/g
PCB-131	20	J	0.48	20	pg/g
PCB-132	1000		0.47	20	pg/g
PCB-133	83		0.46	20	pg/g
PCB-134/143	120	C	0.51	40	pg/g
PCB-135/151	900	C	0.43	40	pg/g
PCB-136	310		0.33	20	pg/g
PCB-137	240		0.34	20	pg/g
PCB-139/140	100	C	0.41	40	pg/g
PCB-141	690		0.54	20	pg/g
PCB-142	0.99 U		0.55	20	pg/g
PCB-144	130		0.42	20	pg/g
PCB-145	0.99 U		0.32	20	pg/g
PCB-146	710		0.34	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-147/149	2900	C J	0.41	40	pg/g
PCB-148	3.6	J	0.41	20	pg/g
PCB-150	4.0	J	0.32	20	pg/g
PCB-152	2.1	J ~~JQ~~ EMPC	0.30	20	pg/g
PCB-154	58		0.40	20	pg/g
PCB-155	1.0	J ~~JQ~~ EMPC	0.35	20	pg/g
PCB-156/157	920	C	0.84	4.0	pg/g
PCB-158	680		0.33	20	pg/g
PCB-159	8.5	J	0.72	20	pg/g
PCB-160	0.99 U		0.42	20	pg/g
PCB-161	0.99 U		0.42	20	pg/g
PCB-162	40		0.73	20	pg/g
PCB-164	340		0.43	20	pg/g
PCB-165	0.74	J	0.36	20	pg/g
PCB-167	300		0.63	2.0	pg/g
PCB-169	1.3	J	0.77	2.0	pg/g
PCB-170	590		0.47	20	pg/g
PCB-171/173	210	C	0.49	40	pg/g
PCB-172	120		0.45	20	pg/g
PCB-174	410		0.55	20	pg/g
PCB-175	17	J	0.13	20	pg/g
PCB-176	28		0.096	20	pg/g
PCB-177	340		0.47	20	pg/g
PCB-178	94		0.14	20	pg/g
PCB-179	110		0.10	20	pg/g
PCB-180/193	1100	C	0.38	40	pg/g
PCB-181	15	J	0.39	20	pg/g
PCB-182	5.1	J	0.13	20	pg/g
PCB-183	260		0.29	20	pg/g
PCB-184	0.94	J ~~JQ~~ EMPC	0.11	20	pg/g
PCB-185	48	J FD	0.50	20	pg/g
PCB-186	0.99 U		0.099	20	pg/g
PCB-187	620		0.11	20	pg/g
PCB-188	3.0	J	0.12	20	pg/g
PCB-189	20		0.23	2.0	pg/g
PCB-190	82		0.32	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-191	25		0.35	20	pg/g
PCB-192	0.99 U		0.36	20	pg/g
PCB-194	86		0.26	20	pg/g
PCB-195	34		0.27	20	pg/g
PCB-196	56		0.15	20	pg/g
PCB-197	4.8	J ~~J Q~~ EMPC	0.096	20	pg/g
PCB-198/199	180	C	0.17	40	pg/g
PCB-200	7.2	J ~~J Q~~ EMPC	0.16	20	pg/g
PCB-201	20	J	0.11	20	pg/g
PCB-202	38		0.13	20	pg/g
PCB-203	83		0.16	20	pg/g
PCB-204	0.99 U		0.12	20	pg/g
PCB-205	3.7	J	0.19	20	pg/g
PCB-206	39		0.41	20	pg/g
PCB-207	7.0	J	0.27	20	pg/g
PCB-208	19	J	0.25	20	pg/g
PCB-209	15	J	0.11	20	pg/g
Total MoCB	8.5		0.17	20	pg/g
Total DiCB	150		0.76	20	pg/g
Total TrCB	1100		0.34	20	pg/g
Total TeCB	10000		0.56	20	pg/g
Total PeCB	34000		0.88	20	pg/g
Total HxCB	21000		0.77	20	pg/g
Total HpCB	4100		0.23	20	pg/g
Total OcCB	510		0.19	20	pg/g
Total NoCB	65		0.41	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	45	5.0 - 145
PCB-3L	46	5.0 - 145
PCB-4L	40	5.0 - 145
PCB-19L	44	5.0 - 145
PCB-37L	79	5.0 - 145
PCB-54L	45	5.0 - 145
PCB-77L	91	10 - 145
PCB-81L	90	10 - 145
PCB-104L	56	10 - 145
PCB-105L	87	10 - 145
PCB-114L	86	10 - 145
PCB-118L	86	10 - 145
PCB-123L	87	10 - 145
PCB-126L	93	10 - 145
PCB-155L	72	10 - 145
PCB-156L/157L	115	10 - 145
PCB-167L	113	10 - 145
PCB-169L	108	10 - 145
PCB-188L	90	10 - 145
PCB-189L	113	10 - 145
PCB-202L	101	10 - 145
PCB-205L	91	10 - 145
PCB-206L	90	10 - 145
PCB-208L	99	10 - 145
PCB-209L	83	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	72	5.0 - 145
PCB-178L	81	10 - 145
PCB-111L	83	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	**Work Order #....:**	MQN8P1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.05 g	**Analyst ID....:**	Sylvia H. Krenn		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result

Q Estimated maximum possible concentration (EMPC)

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	4.97
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-52	2700	B	2.0	100	pg/g
PCB-90/101/113	6600	C B	3.8	300	pg/g
PCB-95	2900	B	4.2	100	pg/g
PCB-99	3500		3.8	100	pg/g
PCB-110/115	6700	C B	3.5	200	pg/g
PCB-118	6400	B	3.0	10	pg/g
PCB-153/168	4600	C	1.4	200	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-54L	48		5.0 - 145
PCB-77L	84		10 - 145
PCB-81L	85		10 - 145
PCB-104L	58		10 - 145
PCB-105L	82		10 - 145
PCB-114L	81		10 - 145
PCB-118L	80		10 - 145
PCB-123L	81		10 - 145
PCB-126L	83		10 - 145
PCB-155L	72		10 - 145
PCB-156L/157L	110	C	10 - 145
PCB-167L	107		10 - 145
PCB-169L	105		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	78	5.0 - 145
PCB-178L	81	10 - 145
PCB-111L	78	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	**Work Order #....:**	MQN8R1AD	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	10.52 g	**Analyst ID.....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	1.9	J ~~J Q~~ EMPC	0.24	19	pg/g
PCB-2	2.1	J ~~J Q~~	0.23	19	pg/g
PCB-3	1.5	J ~~J Q~~	0.21	19	pg/g
PCB-4	4.3	J ~~J Q~~	1.4	19	pg/g
PCB-5	9.5 U		1.1	19	pg/g
PCB-6	11	J	1.1	19	pg/g
PCB-7	9.5 U		1.0	19	pg/g
PCB-8	37		1.1	19	pg/g
PCB-9	9.5 U		1.2	19	pg/g
PCB-10	9.5 U		0.86	19	pg/g
PCB-11	70		1.1	19	pg/g
PCB-12/13	19 U	~~C J Q~~	1.1	38	pg/g
PCB-14	9.5 U		0.96	19	pg/g
PCB-15	18	J	0.95	19	pg/g
PCB-16	4.2	J	0.28	19	pg/g
PCB-17	14	~~J B~~	0.23	19	pg/g
PCB-18/30	23	~~C J B~~	0.19	38	pg/g
PCB-19	2.3	J	0.31	19	pg/g
PCB-20/28	500	~~C B~~	0.41	38	pg/g
PCB-21/33	57	~~C B~~	0.39	38	pg/g
PCB-22	130	~~B~~	0.42	19	pg/g
PCB-23	0.95 U		0.39	19	pg/g
PCB-24	0.95 U		0.18	19	pg/g
PCB-25	18	J	0.40	19	pg/g
PCB-26/29	26	~~C~~ J	0.39	38	pg/g
PCB-27	3.9	J	0.17	19	pg/g
PCB-31	170	~~B~~	0.38	19	pg/g
PCB-32	45		0.16	19	pg/g
PCB-34	3.2	J	0.40	19	pg/g
PCB-35	3.4	J	0.42	19	pg/g
PCB-36	7.3	J ~~J Q~~ EMPC	0.37	19	pg/g
PCB-37	34		0.35	19	pg/g
PCB-38	0.95 U		0.42	19	pg/g
PCB-39	3.5	J	0.38	19	pg/g
PCB-40/71	170	~~C~~	0.41	38	pg/g
PCB-41	0.95 U		0.57	19	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

JAC 4512

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	**Work Order #....:**	MQN8R1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.52 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	44		0.46	19	pg/g
PCB-43	5.9	J	0.51	19	pg/g
PCB-45	3.2	J	0.52	19	pg/g
PCB-46	3.2	J	0.51	19	pg/g
PCB-44/47/65	700	~~C B~~	0.41	57	pg/g
PCB-48	21		0.44	19	pg/g
PCB-49/69	290	~~C~~	0.36	38	pg/g
PCB-50/53	43	~~C B~~	0.42	38	pg/g
PCB-51	11	J	0.39	19	pg/g
PCB-52	780	~~B~~	0.44	19	pg/g
PCB-54	0.95 U		0.16	19	pg/g
PCB-55	1.9 U		0.75	19	pg/g
PCB-56	140		0.77	19	pg/g
PCB-57	2.4	J ~~J Q~~ EMPC	0.72	19	pg/g
PCB-58	3.1	J ~~J Q~~ EMPC	0.72	19	pg/g
PCB-59/62/75	61	~~C~~	0.32	57	pg/g
PCB-60	210		0.75	19	pg/g
PCB-61/70/74/76	2000	~~C B~~	0.71	76	pg/g
PCB-63	93		0.65	19	pg/g
PCB-64	150	~~B~~	0.30	19	pg/g
PCB-66	1100	~~B~~	0.74	19	pg/g
PCB-67	21		0.69	19	pg/g
PCB-68	27		0.67	19	pg/g
PCB-72	21		0.70	19	pg/g
PCB-73	0.95 U		0.33	19	pg/g
PCB-77	56		0.68	1.9	pg/g
PCB-78	0.95 U		0.78	19	pg/g
PCB-79	19	J ~~Q~~ EMPC	0.67	19	pg/g
PCB-80	0.95 U		0.65	19	pg/g
PCB-81	2.8		0.64	1.9	pg/g
PCB-82	100		1.7	19	pg/g
PCB-83	1.3 U		1.3	19	pg/g
PCB-84	110		1.6	19	pg/g
PCB-85/116/117	780	~~C~~	1.1	57	pg/g
PCB-86/87/97/108/119/125	1200	~~C~~	1.2	110	pg/g
PCB-88/91	65	~~C~~	1.3	38	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	**Work Order #....:**	MQN8R1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.52 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	4.1	J	1.5	19	pg/g
PCB-90/101/113	2400	C B	1.2	57	pg/g
PCB-92	170		1.4	19	pg/g
PCB-93/100	26	C J	1.3	38	pg/g
PCB-94	6.0	J	1.5	19	pg/g
PCB-95	400	B	1.4	19	pg/g
PCB-96	0.95 U		0.14	19	pg/g
PCB-98/102	31	C J	1.4	38	pg/g
PCB-103	6.2	J	1.2	19	pg/g
PCB-104	0.95 U		0.16	19	pg/g
PCB-105	1800	B	0.99	1.9	pg/g
PCB-106	1.9 U		1.3	19	pg/g
PCB-109	440		0.84	19	pg/g
PCB-107/124	130	C	1.1	38	pg/g
PCB-110/115	3600	C B	1.1	38	pg/g
PCB-111	6.7	J	1.0	19	pg/g
PCB-112	1.3 U		1.3	19	pg/g
PCB-114	150		1.0	1.9	pg/g
PCB-118	6500	E B Exclude DL	0.94	1.9	pg/g
PCB-120	27		1.0	19	pg/g
PCB-121	1.0 U		1.0	19	pg/g
PCB-122	48		1.1	19	pg/g
PCB-123	81		0.98	1.9	pg/g
PCB-126	9.1	J Q EMPC	1.1	1.9	pg/g
PCB-127	5.3	J Q EMPC	1.1	19	pg/g
PCB-128/166	530	C	0.33	38	pg/g
PCB-129/138/163	4300	C B	0.33	57	pg/g
PCB-130	160		0.44	19	pg/g
PCB-131	11	J	0.42	19	pg/g
PCB-132	140		0.41	19	pg/g
PCB-133	46		0.40	19	pg/g
PCB-134/143	35	C J	0.44	38	pg/g
PCB-135/151	130	C	0.38	38	pg/g
PCB-136	12	J	0.29	19	pg/g
PCB-137	190		0.30	19	pg/g
PCB-139/140	84	C	0.36	38	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

DLC 4/5/12

120

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-141	190		0.47	19	pg/g
PCB-142	0.95 U		0.48	19	pg/g
PCB-144	18	J	0.37	19	pg/g
PCB-145	0.95 U		0.28	19	pg/g
PCB-146	690		0.30	19	pg/g
PCB-147/149	740	~~C~~ B	0.36	38	pg/g
PCB-148	1.1	J ~~J Q~~ EMPC	0.36	19	pg/g
PCB-150	0.95 U		0.28	19	pg/g
PCB-152	0.72	J	0.27	19	pg/g
PCB-153/168	~~4400~~	~~C E~~ exclude DL	0.29	38	pg/g
PCB-154	59		0.35	19	pg/g
PCB-155	0.95 U		0.29	19	pg/g
PCB-156/157	870	~~C~~	0.87	3.8	pg/g
PCB-158	600		0.29	19	pg/g
PCB-159	0.96	J ~~J Q~~ EMPC	0.74	19	pg/g
PCB-160	0.95 U		0.36	19	pg/g
PCB-161	0.95 U		0.37	19	pg/g
PCB-162	33		0.74	19	pg/g
PCB-164	130		0.37	19	pg/g
PCB-165	1.0	J ~~J Q~~ EMPC	0.31	19	pg/g
PCB-167	290		0.65	1.9	pg/g
PCB-169	0.95 U		0.82	1.9	pg/g
PCB-170	190		0.47	19	pg/g
PCB-171/173	100	~~C~~	0.48	38	pg/g
PCB-172	71		0.45	19	pg/g
PCB-174	61		0.55	19	pg/g
PCB-175	4.4	J	0.18	19	pg/g
PCB-176	3.0	J	0.13	19	pg/g
PCB-177	110		0.46	19	pg/g
PCB-178	40		0.19	19	pg/g
PCB-179	7.8	J	0.14	19	pg/g
PCB-180/193	660	~~C~~	0.38	38	pg/g
PCB-181	13	J	0.38	19	pg/g
PCB-182	4.1	J	0.18	19	pg/g
PCB-183	200		0.29	19	pg/g
PCB-184	0.57	J ~~J Q~~ EMPC	0.15	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0 95
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-185	1.9 U		0.49	19	pg/g
PCB-186	0.95 U		0.14	19	pg/g
PCB-187	450		0.16	19	pg/g
PCB-188	1.5	J ~~J Q~~ EMPC	0.17	19	pg/g
PCB-189	13		0.22	1.9	pg/g
PCB-190	43		0.31	19	pg/g
PCB-191	14	J	0.34	19	pg/g
PCB-192	0.95 U		0.35	19	pg/g
PCB-194	28		0.31	19	pg/g
PCB-195	9.8	J	0.32	19	pg/g
PCB-196	32		0.17	19	pg/g
PCB-197	2.6	J	0.12	19	pg/g
PCB-198/199	97	~~J~~	0.20	38	pg/g
PCB-200	1.9 U		0.19	19	pg/g
PCB-201	8.3	J	0.14	19	pg/g
PCB-202	20		0.15	19	pg/g
PCB-203	34		0.20	19	pg/g
PCB-204	0.95 U		0.14	19	pg/g
PCB-205	0.95 U		0.22	19	pg/g
PCB-206	9.3	J	0.54	19	pg/g
PCB-207	2.8	J	0.34	19	pg/g
PCB-208	8.8	J	0.31	19	pg/g
PCB-209	6.1	J ~~J Q~~ EMPC	0.15	19	pg/g
Total MoCB	5.5		0.68	19	pg/g
Total DiCB	140		12	19	pg/g
Total TrCB	1000		6.6	19	pg/g
Total TeCB	6100		18	19	pg/g
Total PeCB	22000		36	19	pg/g
Total HxCB	14000		14	19	pg/g
Total HpCB	2000		6.6	19	pg/g
Total OcCB	230		2.2	19	pg/g
Total NoCB	21		1.2	19	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

122

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	41	5.0 - 145
PCB-3L	47	5.0 - 145
PCB-4L	37	5.0 - 145
PCB-19L	42	5.0 - 145
PCB-37L	71	5.0 - 145
PCB-54L	40	5.0 - 145
PCB-77L	79	10 - 145
PCB-81L	80	10 - 145
PCB-104L	52	10 - 145
PCB-105L	78	10 - 145
PCB-114L	76	10 - 145
PCB-118L	76	10 - 145
PCB-123L	77	10 - 145
PCB-126L	80	10 - 145
PCB-155L	70	10 - 145
PCB-156L/157L	103	10 - 145
PCB-167L	101	10 - 145
PCB-169L	95	10 - 145
PCB-188L	79	10 - 145
PCB-189L	100	10 - 145
PCB-202L	86	10 - 145
PCB-205L	83	10 - 145
PCB-206L	76	10 - 145
PCB-208L	87	10 - 145
PCB-209L	72	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	66	5.0 - 145
PCB-178L	74	10 - 145
PCB-111L	77	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	**Work Order #....:**	MQN8R1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.52 g	**Analyst ID....:**	Sylvia H. Krenn		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level

C Co-eluting isomer

E Estimated result. Result concentration exceeds the calibration range.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	**Work Order #....:**	MQN8R2AD	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	01/31/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	4.75
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/24/12		
Prep Batch # .....:	2047107	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	10.52 g	**Analyst ID.....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-99	3700		3.9	95	pg/g
PCB-118	6400	B	3.0	9.5	pg/g
PCB-153/168	4500	C	1.5	190	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-104L	51		10 - 145
PCB-105L	75		10 - 145
PCB-114L	75		10 - 145
PCB-118L	77		10 - 145
PCB-123L	78		10 - 145
PCB-126L	74		10 - 145
PCB-155L	68		10 - 145
PCB-156L/157L	98	C	10 - 145
PCB-167L	97		10 - 145
PCB-169L	98		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	71	5.0 - 145
PCB-178L	74	10 - 145
PCB-111L	74	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	**Work Order #....:**	MQN8V1AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.0	J	0.32	20	pg/g
PCB-2	2.5	J	0.31	20	pg/g
PCB-3	2.0	J	0.29	20	pg/g
PCB-4	10 U		1.3	20	pg/g
PCB-5	10 U		1.8	20	pg/g
PCB-6	7.4	J	1.8	20	pg/g
PCB-7	10 U		1.7	20	pg/g
PCB-8	31		1.8	20	pg/g
PCB-9	10 U		1.9	20	pg/g
PCB-10	10 U		0.90	20	pg/g
PCB-11	91		1.9	20	pg/g
PCB-12/13	20 U		1.9	40	pg/g
PCB-14	10 U		1.6	20	pg/g
PCB-15	14	J	1.6	20	pg/g
PCB-16	1.4	J	0.33	20	pg/g
PCB-17	6.7	J ~~J B~~ MBL	0.27	20	pg/g
PCB-18/30	16	J ~~C J B~~ MBL	0.23	40	pg/g
PCB-19	1.6	J ~~J Q~~ EMPC	0.34	20	pg/g
PCB-20/28	370	~~C~~ ~~B~~	0.59	40	pg/g
PCB-21/33	39	~~C~~ J ~~B~~	0.56	40	pg/g
PCB-22	56	~~B~~	0.61	20	pg/g
PCB-23	1.0 U		0.56	20	pg/g
PCB-24	1.0 U		0.21	20	pg/g
PCB-25	17	J	0.58	20	pg/g
PCB-26/29	40	~~C~~	0.57	40	pg/g
PCB-27	2.4	J	0.20	20	pg/g
PCB-31	200	~~B~~	0.55	20	pg/g
PCB-32	44		0.19	20	pg/g
PCB-34	1.9	J ~~J Q~~ EMPC	0.58	20	pg/g
PCB-35	2.7	J	0.61	20	pg/g
PCB-36	11	J	0.54	20	pg/g
PCB-37	45		0.53	20	pg/g
PCB-38	1.0 U		0.61	20	pg/g
PCB-39	1.6	J	0.55	20	pg/g
PCB-40/71	97	~~C~~	0.34	40	pg/g
PCB-41	1.0 U		0.48	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix....:	BIOLOGICAL
Date Sampled.....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date.....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	47		0.38	20	pg/g
PCB-43	3.2	J	0.42	20	pg/g
PCB-45	2.7	J	0.43	20	pg/g
PCB-46	1.0 U		0.42	20	pg/g
PCB-44/47/65	480	C B	0.34	60	pg/g
PCB-48	9.9	J	0.36	20	pg/g
PCB-49/69	390	C	0.30	40	pg/g
PCB-50/53	15	C J B	0.34	40	pg/g
PCB-51	5.7	J	0.33	20	pg/g
PCB-52	1300	B	0.37	20	pg/g
PCB-54	1.0 U		0.21	20	pg/g
PCB-55	2.0 U		0.79	20	pg/g
PCB-56	210		0.82	20	pg/g
PCB-57	2.9	J	0.76	20	pg/g
PCB-58	3.1	J	0.75	20	pg/g
PCB-59/62/75	42	C J	0.26	60	pg/g
PCB-60	200		0.79	20	pg/g
PCB-61/70/74/76	2100	C B	0.74	80	pg/g
PCB-63	61		0.69	20	pg/g
PCB-64	280	B	0.25	20	pg/g
PCB-66	1200	B	0.78	20	pg/g
PCB-67	22		0.73	20	pg/g
PCB-68	18	J	0.70	20	pg/g
PCB-72	25		0.73	20	pg/g
PCB-73	1.0 U		0.27	20	pg/g
PCB-77	72		0.71	2.0	pg/g
PCB-78	1.0 U		0.83	20	pg/g
PCB-79	16	J	0.71	20	pg/g
PCB-80	1.0 U		0.69	20	pg/g
PCB-81	4.4		0.68	2.0	pg/g
PCB-82	74		1.6	20	pg/g
PCB-83	1.3 U		1.3	20	pg/g
PCB-84	47		1.5	20	pg/g
PCB-85/116/117	690	C	1.1	60	pg/g
PCB-86/87/97/108/119/125	920	C	1.2	120	pg/g
PCB-88/91	160	C	1.3	40	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	**Work Order #....:**	MQN8V1AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	2.9	J	1.4	20	pg/g
PCB-90/101/113	3800	~~C B~~	1.2	60	pg/g
PCB-92	290		1.4	20	pg/g
PCB-93/100	19	~~C~~ J	1.3	40	pg/g
PCB-94	2.6	J ~~J Q~~ EMPC	1.4	20	pg/g
PCB-95	350	~~B~~	1.3	20	pg/g
PCB-96	1.0 U		0.15	20	pg/g
PCB-98/102	16	~~C~~ J	1.3	40	pg/g
PCB-103	7.0	J	1.2	20	pg/g
PCB-104	1.0 U		0.18	20	pg/g
PCB-106	2.0 U		1.2	20	pg/g
PCB-109	410		0.81	20	pg/g
PCB-107/124	160	~~C~~	1.0	40	pg/g
PCB-110/115	3500	~~C B~~	1.1	40	pg/g
PCB-111	6.1	J ~~J Q~~ EMPC	0.97	20	pg/g
PCB-112	1.3 U		1.3	20	pg/g
PCB-114	120		1.0	2.0	pg/g
PCB-120	29		0.97	20	pg/g
PCB-121	1.0 U		0.97	20	pg/g
PCB-122	48		1.0	20	pg/g
PCB-123	63		0.96	2.0	pg/g
PCB-126	17		1.1	2.0	pg/g
PCB-127	6.7	J	1.0	20	pg/g
PCB-128/166	640	~~C~~	0.40	40	pg/g
PCB-129/138/163	5200	~~C B~~	0.41	60	pg/g
PCB-130	230		0.54	20	pg/g
PCB-131	6.4	J ~~J Q~~ EMPC	0.51	20	pg/g
PCB-132	170		0.51	20	pg/g
PCB-133	73		0.50	20	pg/g
PCB-134/143	23	~~C~~ J	0.55	40	pg/g
PCB-135/151	180	~~C~~	0.46	40	pg/g
PCB-136	9.9	J	0.36	20	pg/g
PCB-137	150		0.36	20	pg/g
PCB-139/140	72	~~C~~	0.44	40	pg/g
PCB-141	280		0.58	20	pg/g
PCB-142	1.0 U		0.59	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	**Work Order #....:**	MQN8V1AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-144	31		0.46	20	pg/g
PCB-145	1.0 U		0.35	20	pg/g
PCB-146	730		0.36	20	pg/g
PCB-147/149	1400	~~C~~ ~~B~~	0.44	40	pg/g
PCB-148	1.4	J	0.45	20	pg/g
PCB-150	1.1	J	0.34	20	pg/g
PCB-152	1.0 U		0.33	20	pg/g
PCB-154	55		0.43	20	pg/g
PCB-155	1.6	J	0.35	20	pg/g
PCB-156/157	920	~~C~~	1.1	4.0	pg/g
PCB-158	590		0.36	20	pg/g
PCB-159	1.9	~~J~~ ~~J Q~~ EMPC	0.93	20	pg/g
PCB-160	1.0 U		0.45	20	pg/g
PCB-161	1.0 U		0.45	20	pg/g
PCB-162	33		0.94	20	pg/g
PCB-164	180		0.46	20	pg/g
PCB-165	1.4	~~J~~ ~~J Q~~ EMPC	0.39	20	pg/g
PCB-167	280		0.82	2.0	pg/g
PCB-169	1.0 U		1.0	2.0	pg/g
PCB-170	380		0.78	20	pg/g
PCB-171/173	140	~~C~~	0.80	40	pg/g
PCB-172	100		0.75	20	pg/g
PCB-174	120		0.92	20	pg/g
PCB-175	11	J	0.20	20	pg/g
PCB-176	8.0	J	0.15	20	pg/g
PCB-177	240		0.78	20	pg/g
PCB-178	80		0.21	20	pg/g
PCB-179	17	J	0.16	20	pg/g
PCB-180/193	980	~~C~~	0.63	40	pg/g
PCB-181	13	J	0.64	20	pg/g
PCB-182	3.3	~~J~~ ~~J Q~~ EMPC	0.20	20	pg/g
PCB-183	240		0.48	20	pg/g
PCB-184	0.90	J	0.17	20	pg/g
PCB-185	2.0 U		0.83	20	pg/g
PCB-186	1.0 U		0.15	20	pg/g
PCB-187	690		0.18	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-188	2.7	J ~~J Q~~ EMPC	0.19	20	pg/g
PCB-189	20		0.28	20	pg/g
PCB-190	70		0.52	20	pg/g
PCB-191	22		0.57	20	pg/g
PCB-192	1.0 U		0.60	20	pg/g
PCB-194	96		0.39	20	pg/g
PCB-195	28		0.40	20	pg/g
PCB-196	61		0.29	20	pg/g
PCB-197	6.6	J	0.19	20	pg/g
PCB-198/199	210	C	0.33	40	pg/g
PCB-200	2.0 U		0.31	20	pg/g
PCB-201	19	J	0.23	20	pg/g
PCB-202	45		0.26	20	pg/g
PCB-203	65		0.33	20	pg/g
PCB-204	1.0 U		0.23	20	pg/g
PCB-205	1.0	J	0.27	20	pg/g
PCB-206	27		0.35	20	pg/g
PCB-207	6.8	J	0.23	20	pg/g
PCB-208	19	J	0.22	20	pg/g
PCB-209	16	J	0.16	20	pg/g
Total MoCB	6.6		0.28	20	pg/g
Total DiCB	140		1.6	20	pg/g
Total TrCB	850		0.53	20	pg/g
Total TeCB	6500		0.71	20	pg/g
Total PeCB	22000		1.1	20	pg/g
Total HxCB	16000		1.0	20	pg/g
Total HpCB	3100		0.28	20	pg/g
Total OcCB	530		0.27	20	pg/g
Total NoCB	53		0.34	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	**Work Order #....:**	MQN8V1AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	42	5.0 - 145
PCB-3L	44	5.0 - 145
PCB-4L	37	5.0 - 145
PCB-19L	40	5.0 - 145
PCB-37L	66	5.0 - 145
PCB-54L	38	5.0 - 145
PCB-77L	73	10 - 145
PCB-81L	72	10 - 145
PCB-104L	45	10 - 145
PCB-105L	70	10 - 145
PCB-114L	67	10 - 145
PCB-118L	69	10 - 145
PCB-123L	68	10 - 145
PCB-126L	72	10 - 145
PCB-155L	62	10 - 145
PCB-156L/157L	91	10 - 145
PCB-167L	89	10 - 145
PCB-169L	87	10 - 145
PCB-188L	65	10 - 145
PCB-189L	88	10 - 145
PCB-202L	71	10 - 145
PCB-205L	75	10 - 145
PCB-206L	72	10 - 145
PCB-208L	76	10 - 145
PCB-209L	67	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	58	5.0 - 145
PCB-178L	66	10 - 145
PCB-111L	66	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	**Work Order #....:**	MQN8V1AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V2AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	5
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-99	2800		4.9	100	pg/g
PCB-105	2000	B	4.3	10	pg/g
PCB-118	6100	B	3.8	10	pg/g
PCB-153/168	4500	C	2.0	100	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-104L	49	10 - 145
PCB-105L	68	10 - 145
PCB-114L	68	10 - 145
PCB-118L	73	10 - 145
PCB-123L	73	10 - 145
PCB-126L	73	10 - 145
PCB-155L	65	10 - 145
PCB-156L/157L	96	10 - 145
PCB-167L	96	10 - 145
PCB-169L	88	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-178L	69	10 - 145
PCB-111L	67	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	1.9 U		0.31	19	pg/g
PCB-2	1.4	J	0.29	19	pg/g
PCB-3	1.0	J ~~J Q~~ EMPC	0.26	19	pg/g
PCB-4	9.7 U		1.8	19	pg/g
PCB-5	9.7 U		1.3	19	pg/g
PCB-6	9.7 U		1.3	19	pg/g
PCB-7	9.7 U		1.3	19	pg/g
PCB-8	15	J	1.3	19	pg/g
PCB-9	9.7 U		1.4	19	pg/g
PCB-10	9.7 U		1.2	19	pg/g
PCB-11	47		1.4	19	pg/g
PCB-12/13	19 U		1.4	39	pg/g
PCB-14	9.7 U		1.2	19	pg/g
PCB-15	8.5	J	1.2	19	pg/g
PCB-16	0.97 U		0.37	19	pg/g
PCB-17	2.4	J ~~J B~~ MBL	0.30	19	pg/g
PCB-18/30	6.3	J ~~C J B~~ MBL	0.25	39	pg/g
PCB-19	0.97 U		0.37	19	pg/g
PCB-20/28	160	C B	0.48	39	pg/g
PCB-21/33	15	C J B	0.45	39	pg/g
PCB-22	27	B	0.50	19	pg/g
PCB-23	0.97 U		0.46	19	pg/g
PCB-24	0.97 U		0.23	19	pg/g
PCB-25	8.3	J	0.47	19	pg/g
PCB-26/29	20	C J	0.46	39	pg/g
PCB-27	1.0	J	0.22	19	pg/g
PCB-31	90	B	0.45	19	pg/g
PCB-32	20		0.21	19	pg/g
PCB-34	0.97 U		0.47	19	pg/g
PCB-35	1.9 U		0.50	19	pg/g
PCB-36	5.9	J	0.44	19	pg/g
PCB-37	21		0.43	19	pg/g
PCB-38	0.97 U		0.50	19	pg/g
PCB-39	0.97 U		0.45	19	pg/g
PCB-40/71	48	C	0.28	39	pg/g
PCB-41	0.97 U		0.39	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	21		0.31	19	pg/g
PCB-43	0.69	J ~~JQ~~ EMPC	0.35	19	pg/g
PCB-45	1.2	J ~~JQ~~ EMPC	0.35	19	pg/g
PCB-46	0.97 U		0.35	19	pg/g
PCB-44/47/65	240	~~C B~~	0.28	58	pg/g
PCB-48	0.97 U		0.30	19	pg/g
PCB-49/69	190	~~C~~	0.24	39	pg/g
PCB-50/53	6.5	~~C J B~~	0.28	39	pg/g
PCB-51	2.7	J	0.27	19	pg/g
PCB-52	450	~~B~~	0.30	19	pg/g
PCB-54	0.97 U		0.17	19	pg/g
PCB-55	1.9 U	~~J~~	0.71	19	pg/g
PCB-56	100		0.73	19	pg/g
PCB-57	1.2	J ~~JQ~~ EMPC	0.68	19	pg/g
PCB-58	1.1	J ~~JQ~~ EMPC	0.67	19	pg/g
PCB-59/62/75	19	~~C~~ J	0.22	58	pg/g
PCB-60	80		0.70	19	pg/g
PCB-61/70/74/76	830	~~C B~~	0.66	78	pg/g
PCB-63	23		0.61	19	pg/g
PCB-64	130	~~B~~	0.20	19	pg/g
PCB-66	460	~~B~~	0.69	19	pg/g
PCB-67	12	J	0.65	19	pg/g
PCB-68	8.8	J	0.62	19	pg/g
PCB-72	10	J	0.65	19	pg/g
PCB-73	0.97 U		0.22	19	pg/g
PCB-77	26		0.63	1.9	pg/g
PCB-78	0.97 U		0.74	19	pg/g
PCB-79	7.4	J	0.63	19	pg/g
PCB-80	0.97 U		0.61	19	pg/g
PCB-81	1.8	J ~~JQ~~ EMPC	0.63	1.9	pg/g
PCB-82	32		1.3	19	pg/g
PCB-83	1.0 U		1.0	19	pg/g
PCB-84	21		1.2	19	pg/g
PCB-85/116/117	270	~~C~~	0.86	58	pg/g
PCB-86/87/97/108/119/125	470	~~C~~	0.93	120	pg/g
PCB-88/91	71	~~C~~	1.0	39	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	1.2 U		1.2	19	pg/g
PCB-90/101/113	1400	C B	0.94	58	pg/g
PCB-92	110		1.1	19	pg/g
PCB-93/100	9.5	C J	1.0	39	pg/g
PCB-94	1.1 U		1.1	19	pg/g
PCB-95	120	B	1.1	19	pg/g
PCB-96	0.97 U		0.18	19	pg/g
PCB-98/102	5.4	C J	1.1	39	pg/g
PCB-99	1200		0.94	19	pg/g
PCB-103	3.6	J	0.97	19	pg/g
PCB-104	0.97 U		0.20	19	pg/g
PCB-105	740	B	0.78	1.9	pg/g
PCB-106	1.9 U		1.0	19	pg/g
PCB-109	150		0.66	19	pg/g
PCB-107/124	55	C	0.82	39	pg/g
PCB-110/115	1600	C B	0.86	39	pg/g
PCB-111	0.97 U		0.78	19	pg/g
PCB-112	1.0 U		1.0	19	pg/g
PCB-114	39		0.78	1.9	pg/g
PCB-120	11	J	0.78	19	pg/g
PCB-121	0.97 U		0.78	19	pg/g
PCB-122	19	J	0.82	19	pg/g
PCB-123	26		0.78	1.9	pg/g
PCB-126	6.0		0.92	1.9	pg/g
PCB-127	0.97 U		0.82	19	pg/g
PCB-128/166	270	C	0.34	39	pg/g
PCB-129/138/163	1900	C B	0.34	58	pg/g
PCB-130	77		0.45	19	pg/g
PCB-131	3.6	J	0.43	19	pg/g
PCB-132	62		0.42	19	pg/g
PCB-133	21		0.42	19	pg/g
PCB-134/143	7.0	J C J Q EMPC	0.46	39	pg/g
PCB-135/151	69	C	0.39	39	pg/g
PCB-136	4.7	J	0.30	19	pg/g
PCB-137	55		0.31	19	pg/g
PCB-139/140	33	C	0.37	39	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-141	110		0.48	19	pg/g
PCB-142	0.97 U		0.50	19	pg/g
PCB-144	15	J	0.38	19	pg/g
PCB-145	0.97 U		0.29	19	pg/g
PCB-146	270		0.31	19	pg/g
PCB-147/149	530	¢	0.37	39	pg/g
PCB-148	0.97 U		0.37	19	pg/g
PCB-150	0.97 U		0.28	19	pg/g
PCB-152	0.97 U		0.27	19	pg/g
PCB-153/168	1700	¢	0.30	39	pg/g
PCB-154	23		0.36	19	pg/g
PCB-155	0.97 U		0.29	19	pg/g
PCB-156/157	340	¢	0.80	3.9	pg/g
PCB-158	230		0.30	19	pg/g
PCB-159	0.97 U		0.66	19	pg/g
PCB-160	0.97 U		0.38	19	pg/g
PCB-161	0.97 U		0.38	19	pg/g
PCB-162	11	J	0.67	19	pg/g
PCB-164	70		0.39	19	pg/g
PCB-165	0.97 U		0.32	19	pg/g
PCB-167	110		0.57	1.9	pg/g
PCB-169	0.97 U		0.75	1.9	pg/g
PCB-170	150		0.68	19	pg/g
PCB-171/173	62	¢	0.69	39	pg/g
PCB-172	40		0.65	19	pg/g
PCB-174	40		0.79	19	pg/g
PCB-175	4.5	J	0.23	19	pg/g
PCB-176	2.5	J ~~JQ~~ EMPC	0.17	19	pg/g
PCB-177	76		0.67	19	pg/g
PCB-178	26		0.24	19	pg/g
PCB-179	5.2	J	0.18	19	pg/g
PCB-180/193	390	¢	0.55	39	pg/g
PCB-181	3.7	J ~~JQ~~ EMPC	0.55	19	pg/g
PCB-182	1.5	J ~~JQ~~ EMPC	0.23	19	pg/g
PCB-183	99		0.42	19	pg/g
PCB-184	0.97 U		0.19	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	**Work Order #....:**	MQN8X1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.27 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-185	6.4	J	0.71	19	pg/g
PCB-186	0.97 U		0.18	19	pg/g
PCB-187	270		0.20	19	pg/g
PCB-188	1.9 J ~~J Q~~ EMPC		0.21	19	pg/g
PCB-189	7.4		0.24	1.9	pg/g
PCB-190	28		0.45	19	pg/g
PCB-191	9.2	J	0.49	19	pg/g
PCB-192	0.97 U		0.52	19	pg/g
PCB-194	43		0.40	19	pg/g
PCB-195	12	J	0.41	19	pg/g
PCB-196	30		0.19	19	pg/g
PCB-197	2.7 J ~~J Q~~ EMPC		0.12	19	pg/g
PCB-198/199	92	~~C~~	0.21	39	pg/g
PCB-200	1.9 U		0.20	19	pg/g
PCB-201	9.8	J	0.15	19	pg/g
PCB-202	18	J	0.17	19	pg/g
PCB-203	31		0.21	19	pg/g
PCB-204	0.97 U		0.15	19	pg/g
PCB-205	0.97 U		0.28	19	pg/g
PCB-206	14	J	0.63	19	pg/g
PCB-207	4.9	J	0.41	19	pg/g
PCB-208	10	J	0.39	19	pg/g
PCB-209	9.8	J	0.18	19	pg/g
Total MoCB	2.4		0.26	19	pg/g
Total DiCB	70		1.2	19	pg/g
Total TrCB	380		0.43	19	pg/g
Total TeCB	2700		0.63	19	pg/g
Total PeCB	8700		0.92	19	pg/g
Total HxCB	6000		0.75	19	pg/g
Total HpCB	1200		0.24	19	pg/g
Total OcCB	240		0.28	19	pg/g
Total NoCB	29		0.63	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	**Work Order #....:**	MQN8X1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.27 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	44	5.0 - 145
PCB-3L	48	5.0 - 145
PCB-4L	39	5.0 - 145
PCB-19L	44	5.0 - 145
PCB-37L	70	5.0 - 145
PCB-54L	42	5.0 - 145
PCB-77L	79	10 - 145
PCB-81L	78	10 - 145
PCB-104L	54	10 - 145
PCB-105L	74	10 - 145
PCB-114L	76	10 - 145
PCB-118L	75	10 - 145
PCB-123L	76	10 - 145
PCB-126L	78	10 - 145
PCB-155L	69	10 - 145
PCB-156L/157L	99	10 - 145
PCB-167L	98	10 - 145
PCB-169L	95	10 - 145
PCB-188L	77	10 - 145
PCB-189L	95	10 - 145
PCB-202L	81	10 - 145
PCB-205L	82	10 - 145
PCB-206L	77	10 - 145
PCB-208L	83	10 - 145
PCB-209L	72	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	67	5.0 - 145
PCB-178L	73	10 - 145
PCB-111L	75	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	**Work Order #....:**	MQN8X1AD	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	01/31/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/23/12		
Prep Batch # .....:	2047107	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	10.27 g	**Analyst ID.....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	**Work Order #....:**	MQN8X2AD	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	01/31/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	1.95
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/25/12		
Prep Batch # .....:	2047107	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	10.27 g	**Analyst ID.....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-118	2400	B	1.2	3.9	pg/g

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-118L	75	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-111L	73	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	1.9 U		0.26	20	pg/g
PCB-2	1.9 U		0.25	20	pg/g
PCB-3	0.97 U		0.25	20	pg/g
PCB-4	9.7 U		1.3	20	pg/g
PCB-5	9.7 U		1.4	20	pg/g
PCB-6	9.7 U		1.4	20	pg/g
PCB-7	9.7 U		1.4	20	pg/g
PCB-8	9.7 U		1.4	20	pg/g
PCB-9	9.7 U		1.5	20	pg/g
PCB-10	9.7 U		0.85	20	pg/g
PCB-11	8.6	J	1.5	20	pg/g
PCB-12/13	19 U		1.5	39	pg/g
PCB-14	9.7 U		1.2	20	pg/g
PCB-15	9.7 U		1.3	20	pg/g
PCB-16	0.97 U		0.32	20	pg/g
PCB-17	0.97 U		0.26	20	pg/g
PCB-18/30	1.9 U	CJB	0.22	39	pg/g
PCB-19	0.97 U		0.33	20	pg/g
PCB-20/28	2.5	J ~~CJB~~ MBL	0.33	39	pg/g
PCB-21/33	1.9 U		0.32	39	pg/g
PCB-22	0.97 U		0.35	20	pg/g
PCB-23	0.97 U		0.32	20	pg/g
PCB-24	0.97 U		0.20	20	pg/g
PCB-25	0.97 U		0.33	20	pg/g
PCB-26/29	1.9 U		0.32	39	pg/g
PCB-27	0.97 U		0.20	20	pg/g
PCB-31	1.2	J JB MBL	0.31	20	pg/g
PCB-32	0.52	J	0.19	20	pg/g
PCB-34	0.97 U		0.33	20	pg/g
PCB-35	1.9 U		0.35	20	pg/g
PCB-36	0.97 U		0.30	20	pg/g
PCB-37	0.97 U		0.30	20	pg/g
PCB-38	0.97 U		0.35	20	pg/g
PCB-39	0.97 U		0.31	20	pg/g
PCB-40/71	0.85	CJ	0.22	39	pg/g
PCB-41	0.97 U		0.31	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	0.97 U		0.24	20	pg/g
PCB-43	0.97 U		0.27	20	pg/g
PCB-45	0.97 U		0.28	20	pg/g
PCB-46	0.97 U		0.27	20	pg/g
PCB-44/47/65	11	J ~~CJB~~ MBL	0.22	59	pg/g
PCB-48	0.97 U		0.23	20	pg/g
PCB-49/69	1.1	J ~~CJQ~~ EMPC	0.19	39	pg/g
PCB-50/53	1.9 U		0.22	39	pg/g
PCB-51	1.6	J ~~JQ~~ EMPC	0.21	20	pg/g
PCB-52	2.8	J ~~JB~~ MBL	0.24	20	pg/g
PCB-54	0.97 U		0.14	20	pg/g
PCB-55	1.9 U		0.25	20	pg/g
PCB-56	0.97 U	J	0.25	20	pg/g
PCB-57	0.97 U		0.24	20	pg/g
PCB-58	0.97 U		0.24	20	pg/g
PCB-59/62/75	2.9 U		0.17	59	pg/g
PCB-60	1.2	J ~~JQ~~ EMPC	0.25	20	pg/g
PCB-61/70/74/76	7.6	J ~~CJB~~ MBL	0.23	78	pg/g
PCB-63	0.97 U		0.21	20	pg/g
PCB-64	1.3	J ~~JB~~ MBL	0.16	20	pg/g
PCB-66	6.8	J ~~JQB~~ MBL	0.24	20	pg/g
PCB-67	0.97 U		0.23	20	pg/g
PCB-68	1.9 U	J	0.22	20	pg/g
PCB-72	0.97 U		0.23	20	pg/g
PCB-73	0.97 U		0.17	20	pg/g
PCB-77	0.77	J	0.23	2.0	pg/g
PCB-78	0.97 U		0.26	20	pg/g
PCB-79	0.97 U		0.22	20	pg/g
PCB-80	0.97 U		0.21	20	pg/g
PCB-81	0.97 U		0.21	2.0	pg/g
PCB-82	0.97 U		0.49	20	pg/g
PCB-83	0.97 U		0.40	20	pg/g
PCB-84	0.97 U		0.46	20	pg/g
PCB-85/116/117	4.6	C J	0.33	59	pg/g
PCB-86/87/97/108/119/125	3.0	C J	0.35	120	pg/g
PCB-88/91	1.9 U	C J	0.40	39	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ...:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	0.97 U		0.44	20	pg/g
PCB-90/101/113	7.3	~~C J B~~	0.36	59	pg/g
PCB-92	0.97 U		0.42	20	pg/g
PCB-93/100	1.9 U		0.38	39	pg/g
PCB-94	0.97 U		0.43	20	pg/g
PCB-95	2.4	J ~~J B~~ MBL	0.40	20	pg/g
PCB-96	0.97 U		0.16	20	pg/g
PCB-98/102	1.9 U		0.41	39	pg/g
PCB-99	18	J	0.36	20	pg/g
PCB-103	0.97 U		0.37	20	pg/g
PCB-104	0.97 U		0.17	20	pg/g
PCB-105	9.8	~~B~~	0.30	2.0	pg/g
PCB-106	1.9 U		0.38	20	pg/g
PCB-109	1.9	J ~~J Q~~ EMC	0.25	20	pg/g
PCB-107/124	5.8 U		0.31	39	pg/g
PCB-110/115	18	~~C J B~~	0.33	39	pg/g
PCB-111	0.97 U		0.30	20	pg/g
PCB-112	0.97 U		0.39	20	pg/g
PCB-114	0.97 U		0.30	2.0	pg/g
PCB-118	32	~~B~~	0.28	2.0	pg/g
PCB-120	0.97 U		0.30	20	pg/g
PCB-121	0.97 U		0.30	20	pg/g
PCB-122	0.97 U		0.31	20	pg/g
PCB-123	0.97 U		0.29	2.0	pg/g
PCB-126	0.97 U		0.32	2.0	pg/g
PCB-127	0.97 U		0.31	20	pg/g
PCB-128/166	4.5	~~C J~~	0.23	39	pg/g
PCB-129/138/163	33	~~C B~~	0.24	59	pg/g
PCB-130	1.6	J	0.31	20	pg/g
PCB-131	0.97 U		0.30	20	pg/g
PCB-132	0.97 U		0.29	20	pg/g
PCB-133	0.97 U		0.29	20	pg/g
PCB-134/143	1.9 U		0.32	39	pg/g
PCB-135/151	1.9 U		0.27	39	pg/g
PCB-136	0.97 U		0.21	20	pg/g
PCB-137	0.62	J ~~J Q~~ EMPC	0.21	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	1.9 U		0.25	39	pg/g
PCB-141	0.97 U		0.34	20	pg/g
PCB-142	0.97 U		0.34	20	pg/g
PCB-144	0.97 U		0.26	20	pg/g
PCB-145	0.97 U		0.20	20	pg/g
PCB-146	4.0	~~J Q~~ J EMC	0.21	20	pg/g
PCB-147/149	4.4	~~C J Q B~~ J EMC	0.26	39	pg/g
PCB-148	0.97 U		0.26	20	pg/g
PCB-150	0.97 U		0.20	20	pg/g
PCB-152	0.97 U		0.19	20	pg/g
PCB-153/168	35	~~C~~	0.20	39	pg/g
PCB-154	0.97 U		0.25	20	pg/g
PCB-155	0.97 U		0.21	20	pg/g
PCB-156/157	5.2	~~C~~	0.27	3.9	pg/g
PCB-158	3.4	J	0.21	20	pg/g
PCB-159	0.97 U		0.24	20	pg/g
PCB-160	0.97 U		0.26	20	pg/g
PCB-161	0.97 U		0.26	20	pg/g
PCB-162	0.97 U	~~J Q~~	0.24	20	pg/g
PCB-164	0.97 U		0.27	20	pg/g
PCB-165	0.97 U		0.22	20	pg/g
PCB-167	1.8	J	0.20	2.0	pg/g
PCB-169	0.97 U		0.27	2.0	pg/g
PCB-170	5.8	~~J Q~~ J EMC	0.39	20	pg/g
PCB-171/173	1.7	~~C~~ J	0.40	39	pg/g
PCB-172	1.3	J	0.37	20	pg/g
PCB-174	0.97 U		0.45	20	pg/g
PCB-175	0.97 U		0.19	20	pg/g
PCB-176	0.97 U		0.14	20	pg/g
PCB-177	2.7	J	0.38	20	pg/g
PCB-178	1.5	J	0.19	20	pg/g
PCB-179	0.97 U		0.15	20	pg/g
PCB-180/193	11	~~C~~ J	0.31	39	pg/g
PCB-181	1.9 U		0.32	20	pg/g
PCB-182	0.97 U		0.19	20	pg/g
PCB-183	2.6	J	0.24	20	pg/g

CH2M Hill Inc

Sample ID: **VWW06-CRB05-0212**

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	**Work Order #....:**	MQN811AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.22 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.97 U		0.15	20	pg/g
PCB-185	1.9 U		0.41	20	pg/g
PCB-186	0.97 U		0.14	20	pg/g
PCB-187	4.5	J	0.16	20	pg/g
PCB-188	0.97 U		0.17	20	pg/g
PCB-189	0.97 U		0.20	2.0	pg/g
PCB-190	0.97 U		0.26	20	pg/g
PCB-191	0.97 U		0.28	20	pg/g
PCB-192	0.97 U		0.29	20	pg/g
PCB-194	1.4	J	0.28	20	pg/g
PCB-195	0.97 U		0.29	20	pg/g
PCB-196	1.0	J	0.18	20	pg/g
PCB-197	0.97 U		0.12	20	pg/g
PCB-198/199	2.6	~~J~~ J	0.20	39	pg/g
PCB-200	1.9 U		0.19	20	pg/g
PCB-201	0.97 U		0.14	20	pg/g
PCB-202	0.97	J	0.16	20	pg/g
PCB-203	1.2	J	0.20	20	pg/g
PCB-204	0.97 U		0.14	20	pg/g
PCB-205	0.97 U		0.20	20	pg/g
PCB-206	0.97 U		0.63	20	pg/g
PCB-207	0.97 U		0.41	20	pg/g
PCB-208	1.5	J ~~J~~ Q EMPC	0.39	20	pg/g
PCB-209	1.9 U	~~J~~	0.15	20	pg/g
Total MoCB	0.25 U	~~U~~	0.25	20	pg/g
Total DiCB	8.6		1.3	20	pg/g
Total TrCB	4.9		0.30	20	pg/g
Total TeCB	37		0.23	20	pg/g
Total PeCB	97		0.32	20	pg/g
Total HxCB	94		0.27	20	pg/g
Total HpCB	31		0.20	20	pg/g
Total OcCB	7.3		0.20	20	pg/g
Total NoCB	1.5		0.63	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	40	5.0 - 145
PCB-3L	42	5.0 - 145
PCB-4L	34	5.0 - 145
PCB-19L	38	5.0 - 145
PCB-37L	62	5.0 - 145
PCB-54L	36	5.0 - 145
PCB-77L	66	10 - 145
PCB-81L	66	10 - 145
PCB-104L	43	10 - 145
PCB-105L	62	10 - 145
PCB-114L	62	10 - 145
PCB-118L	63	10 - 145
PCB-123L	64	10 - 145
PCB-126L	65	10 - 145
PCB-155L	57	10 - 145
PCB-156L/157L	82	10 - 145
PCB-167L	82	10 - 145
PCB-169L	77	10 - 145
PCB-188L	65	10 - 145
PCB-189L	80	10 - 145
PCB-202L	69	10 - 145
PCB-205L	70	10 - 145
PCB-206L	65	10 - 145
PCB-208L	71	10 - 145
PCB-209L	63	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	58	5.0 - 145
PCB-178L	61	10 - 145
PCB-111L	62	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	**Work Order #....:**	MQN811AD	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	02/01/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	10.22 g	**Analyst ID.....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ...:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-1	2.0 U	0.22	20	pg/g
PCB-2	2.0 U	0.21	20	pg/g
PCB-3	0.99 U	0.19	20	pg/g
PCB-4	9.9 U	1.3	20	pg/g
PCB-5	9.9 U	0.99	20	pg/g
PCB-6	9.9 U	1.0	20	pg/g
PCB-7	9.9 U	0.96	20	pg/g
PCB-8	9.9 U	1.0	20	pg/g
PCB-9	9.9 U	1.1	20	pg/g
PCB-10	9.9 U	0.82	20	pg/g
PCB-11	21	1.0	20	pg/g
PCB-12/13	20 U	1.0	40	pg/g
PCB-14	9.9 U	0.88	20	pg/g
PCB-15	9.9 U	0.86	20	pg/g
PCB-16	0.99 U	0.26	20	pg/g
PCB-17	0.99 ~~0.64~~ U ~~J B~~ MBL	0.21	20	pg/g
PCB-18/30	2.0 U C J B	0.18	40	pg/g
PCB-19	0.99 U	0.28	20	pg/g
PCB-20/28	2.7 J ~~C J Q B~~ MBL	0.24	40	pg/g
PCB-21/33	2.0 U ~~C J Q B~~	0.23	40	pg/g
PCB-22	0.99 ~~0.71~~ U ~~J B~~ MBL	0.25	20	pg/g
PCB-23	0.99 U	0.23	20	pg/g
PCB-24	0.99 U	0.16	20	pg/g
PCB-25	0.99 U	0.23	20	pg/g
PCB-26/29	2.0 U	0.23	40	pg/g
PCB-27	0.99 U	0.16	20	pg/g
PCB-31	1.5 J ~~J Q B~~ MBL	0.22	20	pg/g
PCB-32	0.59 J	0.15	20	pg/g
PCB-34	0.99 U	0.23	20	pg/g
PCB-35	2.0 U	0.25	20	pg/g
PCB-36	0.99 U	0.22	20	pg/g
PCB-37	0.99 U	0.21	20	pg/g
PCB-38	0.99 U	0.25	20	pg/g
PCB-39	0.99 U	0.22	20	pg/g
PCB-40/71	1.1 C J	0.22	40	pg/g
PCB-41	0.99 U	0.30	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	**Work Order #....:**	MQN821AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.1 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	0.99 U		0.24	20	pg/g
PCB-43	0.99 U		0.27	20	pg/g
PCB-45	0.99 U		0.27	20	pg/g
PCB-46	0.99 U		0.27	20	pg/g
PCB-44/47/65	11	J ~~CJB~~ MBL	0.22	59	pg/g
PCB-48	0.99 U		0.23	20	pg/g
PCB-49/69	0.85	J ~~CJQ~~ EMPC	0.19	40	pg/g
PCB-50/53	2.0 U		0.22	40	pg/g
PCB-51	1.0	J ~~JQ~~ EMPC	0.21	20	pg/g
PCB-52	3.8	J ~~JB~~ MBL	0.24	20	pg/g
PCB-54	0.99 U		0.13	20	pg/g
PCB-55	2.0 U		0.23	20	pg/g
PCB-56	0.99 U	~~JQ~~	0.24	20	pg/g
PCB-57	0.99 U		0.22	20	pg/g
PCB-58	0.99 U		0.22	20	pg/g
PCB-59/62/75	3.0 U		0.17	59	pg/g
PCB-60	2.0 U	~~JQ~~	0.23	20	pg/g
PCB-61/70/74/76	7.4	J ~~CJQB~~ MBL	0.22	79	pg/g
PCB-63	0.99 U		0.20	20	pg/g
PCB-64	1.2	J ~~JQB~~ MBL	0.16	20	pg/g
PCB-66	8.2	J ~~JB~~ MBL	0.23	20	pg/g
PCB-67	0.99 U		0.21	20	pg/g
PCB-68	2.0 U	~~JQ~~	0.20	20	pg/g
PCB-72	0.99 U		0.21	20	pg/g
PCB-73	0.99 U		0.17	20	pg/g
PCB-77	0.54	J	0.21	2.0	pg/g
PCB-78	0.99 U		0.24	20	pg/g
PCB-79	0.99 U		0.21	20	pg/g
PCB-80	0.99 U		0.20	20	pg/g
PCB-81	0.99 U		0.20	2.0	pg/g
PCB-82	0.99 U		0.32	20	pg/g
PCB-83	0.99 U		0.26	20	pg/g
PCB-84	1.3	J ~~JQ~~ EMPC	0.31	20	pg/g
PCB-85/116/117	4.7	J ~~CJQ~~	0.22	59	pg/g
PCB-86/87/97/108/119/125	3.4	J ~~CJQ~~	0.23	120	pg/g
PCB-88/91	1.4	J ~~CJQ~~	0.26	40	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	0.99 U		0.29	20	pg/g
PCB-90/101/113	9.2	~~C~~ J ~~B~~	0.24	59	pg/g
PCB-92	1.4	J	0.28	20	pg/g
PCB-93/100	2.0 U		0.26	40	pg/g
PCB-94	0.99 U		0.28	20	pg/g
PCB-95	3.5	J ~~J B~~ MBL	0.27	20	pg/g
PCB-96	0.99 U		0.12	20	pg/g
PCB-98/102	2.0 U		0.27	40	pg/g
PCB-99	20	J	0.24	20	pg/g
PCB-103	0.99 U		0.24	20	pg/g
PCB-104	0.99 U		0.13	20	pg/g
PCB-105	11	~~B~~	0.19	2.0	pg/g
PCB-106	2.0 U		0.25	20	pg/g
PCB-109	2.2	J ~~J Q~~ EMC	0.17	20	pg/g
PCB-107/124	5.9 U		0.21	40	pg/g
PCB-110/115	21	~~C~~ J ~~B~~	0.22	40	pg/g
PCB-111	0.99 U		0.20	20	pg/g
PCB-112	0.99 U		0.26	20	pg/g
PCB-114	0.99 U		0.20	2.0	pg/g
PCB-118	34	~~B~~	0.18	2.0	pg/g
PCB-120	0.99 U		0.20	20	pg/g
PCB-121	0.99 U		0.20	20	pg/g
PCB-122	0.99 U		0.21	20	pg/g
PCB-123	0.99 U		0.20	2.0	pg/g
PCB-126	0.99 U		0.21	2.0	pg/g
PCB-127	0.99 U		0.21	20	pg/g
PCB-128/166	4.8	~~C~~ J	0.24	40	pg/g
PCB-129/138/163	35	~~C~~ J ~~B~~	0.24	59	pg/g
PCB-130	2.2	J	0.32	20	pg/g
PCB-131	0.99 U		0.31	20	pg/g
PCB-132	0.71 J	~~J Q~~ EMC	0.30	20	pg/g
PCB-133	0.99 U		0.30	20	pg/g
PCB-134/143	2.0 U		0.33	40	pg/g
PCB-135/151	1.4	J ~~C J Q~~ EMC	0.28	40	pg/g
PCB-136	0.99 U	~~J Q~~	0.21	20	pg/g
PCB-137	0.99 U	~~J Q~~	0.22	20	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

4572

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	**Work Order #....:**	MQN821AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.1 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	2.0 U		0.26	40	pg/g
PCB-141	1.0	J ~~J Q~~ EMPC	0.34	20	pg/g
PCB-142	0.99 U		0.35	20	pg/g
PCB-144	0.99 U		0.27	20	pg/g
PCB-145	0.99 U		0.21	20	pg/g
PCB-146	4.4	J	0.22	20	pg/g
PCB-147/149	6.4	~~C~~ J ~~B~~	0.26	40	pg/g
PCB-148	0.99 U		0.27	20	pg/g
PCB-150	0.99 U		0.20	20	pg/g
PCB-152	0.99 U		0.19	20	pg/g
PCB-153/168	37	~~C~~	0.21	40	pg/g
PCB-154	0.80	J ~~J Q~~ EMPC	0.26	20	pg/g
PCB-155	0.99 U		0.22	20	pg/g
PCB-156/157	4.9	~~C~~	0.22	4.0	pg/g
PCB-158	3.5	J	0.21	20	pg/g
PCB-159	0.99 U		0.18	20	pg/g
PCB-160	0.99 U		0.27	20	pg/g
PCB-161	0.99 U		0.27	20	pg/g
PCB-162	0.99 U	~~J Q~~	0.19	20	pg/g
PCB-164	0.99 U		0.27	20	pg/g
PCB-165	0.99 U		0.23	20	pg/g
PCB-167	1.6	J	0.16	2.0	pg/g
PCB-169	0.99 U		0.20	2.0	pg/g
PCB-170	5.0	J ~~J Q~~ EMPC	0.31	20	pg/g
PCB-171/173	1.7	~~C~~ J	0.32	40	pg/g
PCB-172	1.4	J	0.30	20	pg/g
PCB-174	0.99 U		0.36	20	pg/g
PCB-175	0.99 U		0.13	20	pg/g
PCB-176	0.99 U		0.094	20	pg/g
PCB-177	2.9	J	0.31	20	pg/g
PCB-178	1.4	J ~~J Q~~ EMPC	0.13	20	pg/g
PCB-179	0.99 U		0.10	20	pg/g
PCB-180/193	12	~~C~~ J	0.25	40	pg/g
PCB-181	2.0 U		0.25	20	pg/g
PCB-182	0.99 U		0.13	20	pg/g
PCB-183	2.6	J ~~J Q~~ EMPC	0.19	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix.....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	0.99
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.99 U		0.11	20	pg/g
PCB-185	2.0 U		0.33	20	pg/g
PCB-186	0.99 U		0.097	20	pg/g
PCB-187	4.7	J	0.11	20	pg/g
PCB-188	0.99 U		0.12	20	pg/g
PCB-189	0.99 U	J	0.17	2.0	pg/g
PCB-190	0.99 U		0.21	20	pg/g
PCB-191	0.99 U		0.23	20	pg/g
PCB-192	0.99 U		0.24	20	pg/g
PCB-194	1.2	J ~~JQ~~ EMPC	0.26	20	pg/g
PCB-195	0.99 U		0.27	20	pg/g
PCB-196	1.0	J ~~JQ~~ EMPC	0.12	20	pg/g
PCB-197	0.99 U	~~JQ~~	0.077	20	pg/g
PCB-198/199	2.3	J ~~CJQ~~ EMPC	0.13	40	pg/g
PCB-200	2.0 U		0.12	20	pg/g
PCB-201	0.99 U	J	0.092	20	pg/g
PCB-202	1.3	J	0.10	20	pg/g
PCB-203	0.92	J ~~JQ~~ EMPC	0.13	20	pg/g
PCB-204	0.99 U		0.093	20	pg/g
PCB-205	0.99 U		0.19	20	pg/g
PCB-206	0.99 U		0.50	20	pg/g
PCB-207	0.99 U		0.32	20	pg/g
PCB-208	0.88	J ~~JQ~~ EMPC	0.30	20	pg/g
PCB-209	2.0 U	~~JQ~~	0.15	20	pg/g
Total MoCB	0.19 U	U	0.19	20	pg/g
Total DiCB	21		0.86	20	pg/g
Total TrCB	7.4		0.20	20	pg/g
Total TcCB	37		0.21	20	pg/g
Total PeCB	110		0.21	20	pg/g
Total HxCB	100		0.20	20	pg/g
Total HpCB	32		0.17	20	pg/g
Total OcCB	7.6		0.19	20	pg/g
Total NoCB	0.88		0.50	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	**Work Order #....:**	MQN821AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ...:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.1 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	40	5.0 - 145
PCB-3L	44	5.0 - 145
PCB-4L	36	5.0 - 145
PCB-19L	40	5.0 - 145
PCB-37L	69	5.0 - 145
PCB-54L	39	5.0 - 145
PCB-77L	78	10 - 145
PCB-81L	77	10 - 145
PCB-104L	48	10 - 145
PCB-105L	72	10 - 145
PCB-114L	71	10 - 145
PCB-118L	71	10 - 145
PCB-123L	72	10 - 145
PCB-126L	78	10 - 145
PCB-155L	62	10 - 145
PCB-156L/157L	97	10 - 145
PCB-167L	95	10 - 145
PCB-169L	91	10 - 145
PCB-188L	72	10 - 145
PCB-189L	95	10 - 145
PCB-202L	80	10 - 145
PCB-205L	77	10 - 145
PCB-206L	74	10 - 145
PCB-208L	82	10 - 145
PCB-209L	72	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	64	5.0 - 145
PCB-178L	68	10 - 145
PCB-111L	68	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	**Work Order #....:**	MQN821AD	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	02/01/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	0.99
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	10.1 g	**Analyst ID.....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer

J Estimated Result

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.0 U		0.24	20	pg/g
PCB-2	2.0 U		0.25	20	pg/g
PCB-3	0.98 U		0.24	20	pg/g
PCB-4	9.8 U		1.3	20	pg/g
PCB-5	9.8 U		1.4	20	pg/g
PCB-6	9.8 U		1.4	20	pg/g
PCB-7	9.8 U		1.3	20	pg/g
PCB-8	3.4	J	1.4	20	pg/g
PCB-9	9.8 U		1.5	20	pg/g
PCB-10	9.8 U		0.84	20	pg/g
PCB-11	14	J	1.4	20	pg/g
PCB-12/13	20 U		1.4	39	pg/g
PCB-14	9.8 U		1.2	20	pg/g
PCB-15	9.8 U		1.3	20	pg/g
PCB-16	0.98 U		0.25	20	pg/g
PCB-17	0.98 U		0.21	20	pg/g
PCB-18/30	2.0 U	~~CJQB~~	0.17	39	pg/g
PCB-19	0.98 U		0.25	20	pg/g
PCB-20/28	2.0 U	~~CJQB~~ MBL	0.31	39	pg/g
PCB-21/33	2.0 U	~~CJB~~	0.29	39	pg/g
PCB-22	0.98 U		0.32	20	pg/g
PCB-23	0.98 U		0.29	20	pg/g
PCB-24	0.98 U		0.16	20	pg/g
PCB-25	0.98 U		0.30	20	pg/g
PCB-26/29	2.0 U		0.30	39	pg/g
PCB-27	0.98 U		0.15	20	pg/g
PCB-31	1.4	J ~~JB~~ MDL	0.29	20	pg/g
PCB-32	0.98 U		0.15	20	pg/g
PCB-34	0.98 U		0.30	20	pg/g
PCB-35	2.0 U		0.32	20	pg/g
PCB-36	0.98 U		0.28	20	pg/g
PCB-37	0.98 U		0.28	20	pg/g
PCB-38	0.98 U		0.32	20	pg/g
PCB-39	0.98 U		0.29	20	pg/g
PCB-40/71	0.78	CJ	0.19	39	pg/g
PCB-41	0.98 U		0.27	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	0.98 U		0.22	20	pg/g
PCB-43	0.98 U		0.24	20	pg/g
PCB-45	0.98 U		0.24	20	pg/g
PCB-46	0.98 U		0.24	20	pg/g
PCB-44/47/65	10	J ~~C J B~~ MBL	0.19	59	pg/g
PCB-48	0.98 U		0.21	20	pg/g
PCB-49/69	2.3	C J	0.17	39	pg/g
PCB-50/53	2.0 U		0.20	39	pg/g
PCB-51	1.6	J	0.19	20	pg/g
PCB-52	5.5	J ~~J B~~ MBL	0.21	20	pg/g
PCB-54	0.98 U		0.13	20	pg/g
PCB-55	2.0 U		0.24	20	pg/g
PCB-56	0.98 U	~~J Q~~	0.25	20	pg/g
PCB-57	0.98 U		0.23	20	pg/g
PCB-58	0.98 U		0.23	20	pg/g
PCB-59/62/75	2.9 U		0.15	59	pg/g
PCB-60	2.0 U	J	0.24	20	pg/g
PCB-61/70/74/76	8.5	J ~~C J B~~ MBL	0.23	79	pg/g
PCB-63	0.98 U		0.21	20	pg/g
PCB-64	1.0	J ~~J B~~ MBL	0.14	20	pg/g
PCB-66	4.4	J ~~J B~~ MBL	0.24	20	pg/g
PCB-67	0.98 U		0.22	20	pg/g
PCB-68	2.0 U	~~J Q~~	0.21	20	pg/g
PCB-72	0.98 U		0.22	20	pg/g
PCB-73	0.98 U		0.15	20	pg/g
PCB-77	0.98 U		0.22	2.0	pg/g
PCB-78	0.98 U		0.25	20	pg/g
PCB-79	0.98 U		0.22	20	pg/g
PCB-80	0.98 U		0.21	20	pg/g
PCB-81	0.98 U		0.21	2.0	pg/g
PCB-82	0.98 U		0.36	20	pg/g
PCB-83	0.98 U		0.29	20	pg/g
PCB-84	1.9	J	0.34	20	pg/g
PCB-85/116/117	2.5	C J	0.24	59	pg/g
PCB-86/87/97/108/119/125	7.2	C J	0.26	120	pg/g
PCB-88/91	1.4	C J	0.29	39	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	0.98 U		0.32	20	pg/g
PCB-90/101/113	16	~~CJB~~	0.26	59	pg/g
PCB-92	2.5	J ~~JQ~~ EMPC	0.31	20	pg/g
PCB-93/100	2.0 U		0.28	39	pg/g
PCB-94	0.98 U		0.31	20	pg/g
PCB-95	5.9	J ~~JB~~ MBL	0.29	20	pg/g
PCB-96	0.98 U		0.13	20	pg/g
PCB-98/102	2.0 U		0.30	39	pg/g
PCB-99	9.8	J	0.26	20	pg/g
PCB-103	0.98 U		0.27	20	pg/g
PCB-104	0.98 U		0.14	20	pg/g
PCB-105	4.8	~~B~~	0.21	2.0	pg/g
PCB-106	2.0 U		0.28	20	pg/g
PCB-109	2.0 U	~~JQ~~	0.18	20	pg/g
PCB-107/124	5.9 U	~~CJQ~~	0.23	39	pg/g
PCB-110/115	15	~~CJB~~	0.24	39	pg/g
PCB-111	0.98 U		0.22	20	pg/g
PCB-112	0.98 U		0.28	20	pg/g
PCB-114	0.98 U	~~JQ~~	0.22	2.0	pg/g
PCB-118	14	~~B~~	0.20	2.0	pg/g
PCB-120	0.98 U		0.22	20	pg/g
PCB-121	0.98 U		0.22	20	pg/g
PCB-122	0.98 U		0.23	20	pg/g
PCB-123	0.98 U	~~JQ~~	0.22	2.0	pg/g
PCB-126	0.98 U		0.24	2.0	pg/g
PCB-127	0.98 U		0.23	20	pg/g
PCB-128/166	1.2	~~CJ~~	0.21	39	pg/g
PCB-129/138/163	10	~~CJB~~	0.21	59	pg/g
PCB-130	0.98 U		0.28	20	pg/g
PCB-131	0.98 U		0.27	20	pg/g
PCB-132	1.8	J ~~JQ~~ EMPC	0.26	20	pg/g
PCB-133	0.98 U		0.26	20	pg/g
PCB-134/143	2.0 U		0.28	39	pg/g
PCB-135/151	2.3	~~CJ~~	0.24	39	pg/g
PCB-136	0.71	J ~~JQ~~ EMPC	0.18	20	pg/g
PCB-137	0.98 U		0.19	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix.....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	2.0 U		0.23	39	pg/g
PCB-141	1.4	J	0.30	20	pg/g
PCB-142	0.98 U		0.31	20	pg/g
PCB-144	0.98 U		0.24	20	pg/g
PCB-145	0.98 U		0.18	20	pg/g
PCB-146	1.5	J	0.19	20	pg/g
PCB-147/149	5.9	~~C~~ J ~~B~~	0.23	39	pg/g
PCB-148	0.98 U		0.23	20	pg/g
PCB-150	0.98 U		0.18	20	pg/g
PCB-152	0.98 U		0.17	20	pg/g
PCB-153/168	11	~~C~~ J	0.18	39	pg/g
PCB-154	0.98 U		0.22	20	pg/g
PCB-155	0.98 U		0.19	20	pg/g
PCB-156/157	1.5	~~C~~ J	0.21	3.9	pg/g
PCB-158	1.5	J	0.19	20	pg/g
PCB-159	0.98 U		0.18	20	pg/g
PCB-160	0.98 U		0.23	20	pg/g
PCB-161	0.98 U		0.23	20	pg/g
PCB-162	0.98 U		0.19	20	pg/g
PCB-164	0.98 U		0.24	20	pg/g
PCB-165	0.98 U		0.20	20	pg/g
PCB-167	0.70	J	0.16	2.0	pg/g
PCB-169	0.98 U		0.20	2.0	pg/g
PCB-170	2.5	J ~~J Q~~ EMPC	0.31	20	pg/g
PCB-171/173	2.0 U		0.32	39	pg/g
PCB-172	0.98 U		0.30	20	pg/g
PCB-174	0.98 U		0.36	20	pg/g
PCB-175	0.98 U		0.14	20	pg/g
PCB-176	0.98 U		0.10	20	pg/g
PCB-177	0.98 U		0.31	20	pg/g
PCB-178	0.98 U		0.15	20	pg/g
PCB-179	0.98 U		0.11	20	pg/g
PCB-180/193	2.7	J ~~C J Q~~ EMPC	0.25	39	pg/g
PCB-181	2.0 U		0.25	20	pg/g
PCB-182	0.98 U		0.14	20	pg/g
PCB-183	2.0 U	~~J~~	0.19	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.98 U		0.11	20	pg/g
PCB-185	2.0 U		0.33	20	pg/g
PCB-186	0.98 U		0.11	20	pg/g
PCB-187	0.88	J	0.12	20	pg/g
PCB-188	0.98 U		0.14	20	pg/g
PCB-189	0.98 U		0.17	2.0	pg/g
PCB-190	0.98 U		0.21	20	pg/g
PCB-191	0.98 U		0.23	20	pg/g
PCB-192	0.98 U		0.24	20	pg/g
PCB-194	0.98 U		0.21	20	pg/g
PCB-195	0.98 U		0.22	20	pg/g
PCB-196	0.98 U		0.16	20	pg/g
PCB-197	0.98 U		0.10	20	pg/g
PCB-198/199	2.0 U		0.18	39	pg/g
PCB-200	2.0 U		0.17	20	pg/g
PCB-201	0.98 U		0.13	20	pg/g
PCB-202	0.98 U		0.15	20	pg/g
PCB-203	0.98 U		0.18	20	pg/g
PCB-204	0.98 U		0.13	20	pg/g
PCB-205	0.98 U		0.14	20	pg/g
PCB-206	0.98 U		0.54	20	pg/g
PCB-207	0.98 U		0.35	20	pg/g
PCB-208	0.98 U		0.32	20	pg/g
PCB-209	2.0 U		0.17	20	pg/g
Total MoCB	0.24 U	U	0.24	20	pg/g
Total DiCB	17		1.3	20	pg/g
Total TrCB	4.8		0.28	20	pg/g
Total TeCB	37		0.22	20	pg/g
Total PeCB	83		0.24	20	pg/g
Total HxCB	40		0.20	20	pg/g
Total HpCB	7.0		0.17	20	pg/g
Total OcCB	0.14 U	U	0.14	20	pg/g
Total NoCB	0.54 U	U	0.54	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	42	5.0 - 145
PCB-3L	44	5.0 - 145
PCB-4L	36	5.0 - 145
PCB-19L	41	5.0 - 145
PCB-37L	65	5.0 - 145
PCB-54L	38	5.0 - 145
PCB-77L	72	10 - 145
PCB-81L	72	10 - 145
PCB-104L	45	10 - 145
PCB-105L	68	10 - 145
PCB-114L	67	10 - 145
PCB-118L	67	10 - 145
PCB-123L	67	10 - 145
PCB-126L	72	10 - 145
PCB-155L	59	10 - 145
PCB-156L/157L	92	10 - 145
PCB-167L	90	10 - 145
PCB-169L	88	10 - 145
PCB-188L	63	10 - 145
PCB-189L	87	10 - 145
PCB-202L	69	10 - 145
PCB-205L	72	10 - 145
PCB-206L	68	10 - 145
PCB-208L	74	10 - 145
PCB-209L	64	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	60	5.0 - 145
PCB-178L	65	10 - 145
PCB-111L	67	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	**Work Order #....:**	MQN831AD	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	01/31/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/23/12		
Prep Batch # ....:	2047107	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	10.18 g	**Analyst ID.....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC)

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample # ...	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	1.9 U		0.21	19	pg/g
PCB-2	1.9 U		0.19	19	pg/g
PCB-3	0.95 U		0.18	19	pg/g
PCB-4	9.5 U		0.87	19	pg/g
PCB-5	9.5 U		0.77	19	pg/g
PCB-6	9.5 U		0.78	19	pg/g
PCB-7	9.5 U		0.74	19	pg/g
PCB-8	6.8	J	0.78	19	pg/g
PCB-9	9.5 U		0.84	19	pg/g
PCB-10	9.5 U		0.55	19	pg/g
PCB-11	12	J	0.81	19	pg/g
PCB-12/13	19 U		0.81	38	pg/g
PCB-14	9.5 U		0.68	19	pg/g
PCB-15	9.5 U	J	0.67	19	pg/g
PCB-16	2.2	J ~~J Q~~ EMPC	0.19	19	pg/g
PCB-17	6.2	J ~~J B~~ MBL	0.15	19	pg/g
PCB-18/30	11	J ~~C J B~~ MBL	0.13	38	pg/g
PCB-19	2.6	J	0.20	19	pg/g
PCB-20/28	52	~~C~~ J ~~B~~	0.31	38	pg/g
PCB-21/33	17	~~C~~ J ~~B~~	0.30	38	pg/g
PCB-22	10	J ~~J B~~ MBL	0.33	19	pg/g
PCB-23	0.95 U		0.30	19	pg/g
PCB-24	0.95 U		0.12	19	pg/g
PCB-25	4.0	J	0.31	19	pg/g
PCB-26/29	7.7	~~C~~ J	0.30	38	pg/g
PCB-27	1.2	J	0.11	19	pg/g
PCB-31	35	J ~~B~~ MBL	0.29	19	pg/g
PCB-32	12	J	0.11	19	pg/g
PCB-34	0.63	J	0.31	19	pg/g
PCB-35	1.9 U		0.33	19	pg/g
PCB-36	4.1	J	0.29	19	pg/g
PCB-37	5.0	J	0.28	19	pg/g
PCB-38	0.95 U		0.33	19	pg/g
PCB-39	0.95 U		0.29	19	pg/g
PCB-40/71	33	~~C~~ J	0.22	38	pg/g
PCB-41	1.5	J	0.31	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	15	J	0.25	19	pg/g
PCB-43	1.9	J	0.27	19	pg/g
PCB-45	3.3	J	0.28	19	pg/g
PCB-46	1.6	J ~~J Q~~ EMAC	0.27	19	pg/g
PCB-44/47/65	160	~~C B~~	0.22	57	pg/g
PCB-48	8.5	J	0.23	19	pg/g
PCB-49/69	150	~~C~~	0.19	38	pg/g
PCB-50/53	20	~~C B~~	0.22	38	pg/g
PCB-51	9.6	J	0.21	19	pg/g
PCB-52	440	~~B~~	0.24	19	pg/g
PCB-54	0.57	J ~~J Q~~ EMAC	0.11	19	pg/g
PCB-55	1.9 U		0.45	19	pg/g
PCB-56	45		0.46	19	pg/g
PCB-57	0.95 U		0.43	19	pg/g
PCB-58	0.95 U		0.43	19	pg/g
PCB-59/62/75	10	~~C~~ J	0.17	57	pg/g
PCB-60	24		0.45	19	pg/g
PCB-61/70/74/76	420	~~C B~~	0.42	77	pg/g
PCB-63	8.0	J	0.39	19	pg/g
PCB-64	55	~~B~~	0.16	19	pg/g
PCB-66	190	~~B~~	0.44	19	pg/g
PCB-67	5.4	J	0.41	19	pg/g
PCB-68	4.0	J	0.40	19	pg/g
PCB-72	4.8	J	0.42	19	pg/g
PCB-73	0.95 U		0.18	19	pg/g
PCB-77	8.2		0.41	1.9	pg/g
PCB-78	0.95 U		0.47	19	pg/g
PCB-79	4.8	J	0.40	19	pg/g
PCB-80	0.95 U		0.39	19	pg/g
PCB-81	0.95 U		0.40	1.9	pg/g
PCB-82	35		0.75	19	pg/g
PCB-83	0.95 U		0.61	19	pg/g
PCB-84	120		0.71	19	pg/g
PCB-85/116/117	170	~~C~~	0.50	57	pg/g
PCB-86/87/97/108/119/125	520	~~C~~	0.54	110	pg/g
PCB-88/91	100	~~C~~	0.61	38	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

164

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	3.6	J	0.67	19	pg/g
PCB-90/101/113	1300	C B	0.55	57	pg/g
PCB-92	230		0.64	19	pg/g
PCB-93/100	5.5	C J	0.59	38	pg/g
PCB-94	2.2	J	0.65	19	pg/g
PCB-95	540	B	0.61	19	pg/g
PCB-96	1.0	J Q EMPC	0.10	19	pg/g
PCB-98/102	17	C J	0.62	38	pg/g
PCB-99	580		0.54	19	pg/g
PCB-103	7.1	J	0.56	19	pg/g
PCB-104	0.95 U		0.11	19	pg/g
PCB-105	270	B	0.46	1.9	pg/g
PCB-106	1.9 U		0.58	19	pg/g
PCB-109	69		0.38	19	pg/g
PCB-107/124	39	C	0.48	38	pg/g
PCB-110/115	1100	C B	0.50	38	pg/g
PCB-111	0.96	J Q EMPC	0.45	19	pg/g
PCB-112	0.95 U		0.59	19	pg/g
PCB-114	19		0.46	1.9	pg/g
PCB-118	970	B	0.42	1.9	pg/g
PCB-120	5.0	J	0.45	19	pg/g
PCB-121	0.95 U		0.45	19	pg/g
PCB-122	9.8	J	0.48	19	pg/g
PCB-123	8.2		0.46	1.9	pg/g
PCB-126	2.2		0.49	1.9	pg/g
PCB-127	0.95 U		0.48	19	pg/g
PCB-128/166	160	C	0.28	38	pg/g
PCB-129/138/163	1100	C B	0.29	57	pg/g
PCB-130	78		0.38	19	pg/g
PCB-131	3.9	J	0.36	19	pg/g
PCB-132	220		0.36	19	pg/g
PCB-133	18	J	0.35	19	pg/g
PCB-134/143	28	C J	0.39	38	pg/g
PCB-135/151	210	C	0.33	38	pg/g
PCB-136	67		0.25	19	pg/g
PCB-137	42		0.26	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	20	~~C~~ J	0.31	38	pg/g
PCB-141	160		0.41	19	pg/g
PCB-142	0.95 U		0.42	19	pg/g
PCB-144	29		0.32	19	pg/g
PCB-145	0.95 U		0.25	19	pg/g
PCB-146	140		0.26	19	pg/g
PCB-147/149	610	~~C~~ B	0.31	38	pg/g
PCB-148	0.76	J ~~J Q~~ EMPC	0.32	19	pg/g
PCB-150	0.83	J ~~J Q~~	0.24	19	pg/g
PCB-152	0.37	J ~~J Q~~	0.23	19	pg/g
PCB-153/168	900	~~C~~	0.25	38	pg/g
PCB-154	11	J	0.30	19	pg/g
PCB-155	0.95 U		0.26	19	pg/g
PCB-156/157	150	~~C~~	0.61	3.8	pg/g
PCB-158	120		0.25	19	pg/g
PCB-159	2.2	J	0.53	19	pg/g
PCB-160	0.95 U		0.32	19	pg/g
PCB-161	0.95 U		0.32	19	pg/g
PCB-162	6.6	J	0.53	19	pg/g
PCB-164	70		0.33	19	pg/g
PCB-165	0.95 U		0.27	19	pg/g
PCB-167	55		0.45	1.9	pg/g
PCB-169	0.95 U		0.59	1.9	pg/g
PCB-170	130		0.35	19	pg/g
PCB-171/173	44	~~C~~	0.36	38	pg/g
PCB-172	24		0.34	19	pg/g
PCB-174	100		0.41	19	pg/g
PCB-175	3.8	J ~~J Q~~ EMPC	0.13	19	pg/g
PCB-176	7.1	J	0.095	19	pg/g
PCB-177	81		0.35	19	pg/g
PCB-178	24		0.13	19	pg/g
PCB-179	29		0.10	19	pg/g
PCB-180/193	230	~~C~~	0.28	38	pg/g
PCB-181	2.9	J	0.29	19	pg/g
PCB-182	0.95 U		0.13	19	pg/g
PCB-183	61		0.22	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	**Work Order #....:**	MQN841AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.45 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.95 U		0.11	19	pg/g
PCB-185	7.2	J	0.37	19	pg/g
PCB-186	0.95 U		0.098	19	pg/g
PCB-187	120		0.11	19	pg/g
PCB-188	0.95 U		0.12	19	pg/g
PCB-189	4.5		0.20	1.9	pg/g
PCB-190	21		0.23	19	pg/g
PCB-191	6.0	J	0.26	19	pg/g
PCB-192	0.95 U		0.27	19	pg/g
PCB-194	25		0.33	19	pg/g
PCB-195	10	J	0.34	19	pg/g
PCB-196	15	J	0.14	19	pg/g
PCB-197	1.2	J ~~JQ~~ EMPC	0.093	19	pg/g
PCB-198/199	45	C	0.16	38	pg/g
PCB-200	2.0	J ~~JQ~~ EMPC	0.15	19	pg/g
PCB-201	4.1	J ~~JQ~~ EMPC	0.11	19	pg/g
PCB-202	11	J	0.13	19	pg/g
PCB-203	28		0.16	19	pg/g
PCB-204	0.95 U		0.11	19	pg/g
PCB-205	1.2	J	0.23	19	pg/g
PCB-206	14	J ~~JQ~~ EMPC	0.18	19	pg/g
PCB-207	1.8	J ~~JQ~~ EMPC	0.12	19	pg/g
PCB-208	6.0	J	0.11	19	pg/g
PCB-209	4.6	J ~~JQ~~ EMPC	0.11	19	pg/g
Total MoCB	0.18 U	U	0.18	19	pg/g
Total DiCB	21		0.67	19	pg/g
Total TrCB	170		0.28	19	pg/g
Total TeCB	1600		0.41	19	pg/g
Total PeCB	6100		0.49	19	pg/g
Total HxCB	4200		0.59	19	pg/g
Total HpCB	910		0.20	19	pg/g
Total OcCB	140		0.23	19	pg/g
Total NoCB	21		0.18	19	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.95
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	43	5.0 - 145
PCB-3L	43	5.0 - 145
PCB-4L	38	5.0 - 145
PCB-19L	41	5.0 - 145
PCB-37L	73	5.0 - 145
PCB-54L	41	5.0 - 145
PCB-77L	82	10 - 145
PCB-81L	81	10 - 145
PCB-104L	52	10 - 145
PCB-105L	79	10 - 145
PCB-114L	78	10 - 145
PCB-118L	78	10 - 145
PCB-123L	77	10 - 145
PCB-126L	83	10 - 145
PCB-155L	69	10 - 145
PCB-156L/157L	101	10 - 145
PCB-167L	101	10 - 145
PCB-169L	96	10 - 145
PCB-188L	81	10 - 145
PCB-189L	101	10 - 145
PCB-202L	87	10 - 145
PCB-205L	83	10 - 145
PCB-206L	81	10 - 145
PCB-208L	91	10 - 145
PCB-209L	77	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	65	5.0 - 145
PCB-178L	74	10 - 145
PCB-111L	77	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	**Work Order #....:**	MQN841AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.95
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.45 g	**Analyst ID....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level

C Co-eluting isomer.

J Estimated Result

Q Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	1.9 U	~~J Q~~	0.27	20	pg/g
PCB-2	1.9 U		0.26	20	pg/g
PCB-3	0.97 U	~~J Q~~	0.24	20	pg/g
PCB-4	9.7 U		1.1	20	pg/g
PCB-5	9.7 U		1.4	20	pg/g
PCB-6	9.7 U		1.4	20	pg/g
PCB-7	9.7 U		1.3	20	pg/g
PCB-8	5.8	J	1.4	20	pg/g
PCB-9	9.7 U		1.5	20	pg/g
PCB-10	9.7 U		0.73	20	pg/g
PCB-11	11	J	1.4	20	pg/g
PCB-12/13	19 U		1.4	39	pg/g
PCB-14	9.7 U		1.2	20	pg/g
PCB-15	9.7 U		1.2	20	pg/g
PCB-16	3.0	J	0.27	20	pg/g
PCB-17	5.2 J	~~J B~~ MBL	0.22	20	pg/g
PCB-18/30	11 J	~~C J B~~ MBL	0.19	39	pg/g
PCB-19	2.1	J	0.28	20	pg/g
PCB-20/28	42 J	~~C B~~ MBL	0.38	39	pg/g
PCB-21/33	11	~~C J B~~	0.36	39	pg/g
PCB-22	6.7 J	~~J Q B~~ MBL	0.39	20	pg/g
PCB-23	0.97 U		0.36	20	pg/g
PCB-24	0.97 U		0.17	20	pg/g
PCB-25	3.0 J	~~J Q~~ EMPC	0.37	20	pg/g
PCB-26/29	6.4 J	~~C J Q~~ EMPC	0.36	39	pg/g
PCB-27	0.84	J	0.17	20	pg/g
PCB-31	28 J	~~B~~ MBL	0.35	20	pg/g
PCB-32	7.0	J	0.16	20	pg/g
PCB-34	0.86 J	~~J Q~~ EMPC	0.37	20	pg/g
PCB-35	1.9 U		0.39	20	pg/g
PCB-36	2.4	J	0.34	20	pg/g
PCB-37	2.4	J	0.34	20	pg/g
PCB-38	0.97 U		0.39	20	pg/g
PCB-39	0.97 U		0.35	20	pg/g
PCB-40/71	16	J	0.36	39	pg/g
PCB-41	1.0	J	0.50	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	**Work Order #....:**	MQN861AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	10 J	~~J~~ MBL	0.40	20	pg/g
PCB-43	1.3	J	0.44	20	pg/g
PCB-45	3.9	J	0.45	20	pg/g
PCB-46	1.6	J	0.45	20	pg/g
PCB-44/47/65	95	~~C B~~	0.36	59	pg/g
PCB-48	6.3	J	0.38	20	pg/g
PCB-49/69	80	~~C~~	0.31	39	pg/g
PCB-50/53	8.3	~~C J B~~	0.36	39	pg/g
PCB-51	3.8	J	0.34	20	pg/g
PCB-52	210	~~B~~	0.39	20	pg/g
PCB-54	0.97 U		0.16	20	pg/g
PCB-55	1.9 U	~~J Q~~	0.44	20	pg/g
PCB-56	27		0.45	20	pg/g
PCB-57	0.97 U		0.42	20	pg/g
PCB-58	0.97 U		0.42	20	pg/g
PCB-59/62/75	6.5	~~C~~ J	0.28	59	pg/g
PCB-60	17	J	0.44	20	pg/g
PCB-61/70/74/76	210	~~C~~ B	0.41	78	pg/g
PCB-63	4.7	J	0.38	20	pg/g
PCB-64	32	~~B~~	0.26	20	pg/g
PCB-66	120	~~B~~	0.43	20	pg/g
PCB-67	3.4 J	~~J Q~~ EMPC	0.40	20	pg/g
PCB-68	2.5 J	~~J Q~~ EMPC	0.39	20	pg/g
PCB-72	2.7	J	0.41	20	pg/g
PCB-73	0.97 U		0.29	20	pg/g
PCB-77	4.3		0.38	2.0	pg/g
PCB-78	0.97 U		0.46	20	pg/g
PCB-79	2.0	J	0.39	20	pg/g
PCB-80	0.97 U		0.38	20	pg/g
PCB-81	0.97 U		0.38	2.0	pg/g
PCB-82	15	J	0.86	20	pg/g
PCB-83	0.97 U		0.70	20	pg/g
PCB-84	47		0.81	20	pg/g
PCB-85/116/117	75	~~C~~	0.58	59	pg/g
PCB-86/87/97/108/119/125	220	~~C~~	0.62	120	pg/g
PCB-88/91	31	~~C~~ J	0.70	39	pg/g

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

4572

171

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	0.97 U		0.77	20	pg/g
PCB-90/101/113	550	~~C~~ B	0.63	59	pg/g
PCB-92	95		0.74	20	pg/g
PCB-93/100	1.8	J ~~C J Q~~ EMPC	0.68	39	pg/g
PCB-94	0.97 U		0.75	20	pg/g
PCB-95	180	~~B~~	0.70	20	pg/g
PCB-96	0.69	J	0.14	20	pg/g
PCB-98/102	3.7	J ~~C J Q~~ EMPC	0.72	39	pg/g
PCB-99	280		0.63	20	pg/g
PCB-103	3.0	J	0.65	20	pg/g
PCB-104	0.97 U		0.16	20	pg/g
PCB-105	130	~~B~~	0.51	2.0	pg/g
PCB-106	1.9 U		0.67	20	pg/g
PCB-109	31		0.44	20	pg/g
PCB-107/124	16	~~C~~ J	0.55	39	pg/g
PCB-110/115	500	~~C~~ ~~B~~	0.57	39	pg/g
PCB-111	0.97 U		0.52	20	pg/g
PCB-112	0.97 U		0.68	20	pg/g
PCB-114	9.4		0.53	2.0	pg/g
PCB-118	440	~~B~~	0.48	2.0	pg/g
PCB-120	2.5	J ~~J Q~~ EMPC	0.52	20	pg/g
PCB-121	0.97 U		0.52	20	pg/g
PCB-122	4.5	J ~~J Q~~ EMPC	0.55	20	pg/g
PCB-123	5.6		0.52	2.0	pg/g
PCB-126	1.2	J	0.60	2.0	pg/g
PCB-127	0.97 U		0.55	20	pg/g
PCB-128/166	73	~~C~~	0.22	39	pg/g
PCB-129/138/163	490	~~C~~ ~~B~~	0.23	59	pg/g
PCB-130	29		0.30	20	pg/g
PCB-131	2.9	J	0.29	20	pg/g
PCB-132	69		0.28	20	pg/g
PCB-133	9.0	J	0.28	20	pg/g
PCB-134/143	14	~~C~~ J	0.30	39	pg/g
PCB-135/151	83	~~C~~	0.26	39	pg/g
PCB-136	27		0.20	20	pg/g
PCB-137	17	J	0.20	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	8.8	C J	0.24	39	pg/g
PCB-141	62		0.32	20	pg/g
PCB-142	0.97 U		0.33	20	pg/g
PCB-144	12	J	0.25	20	pg/g
PCB-145	0.97 U		0.20	20	pg/g
PCB-146	64		0.20	20	pg/g
PCB-147/149	160	C B	0.25	39	pg/g
PCB-148	0.97 U		0.25	20	pg/g
PCB-150	0.97 U		0.19	20	pg/g
PCB-152	0.97 U		0.18	20	pg/g
PCB-153/168	420	C	0.20	39	pg/g
PCB-154	6.3	J	0.24	20	pg/g
PCB-155	0.97 U		0.19	20	pg/g
PCB-156/157	68	C	0.48	3.9	pg/g
PCB-158	49		0.20	20	pg/g
PCB-159	0.97 U		0.40	20	pg/g
PCB-160	0.97 U		0.25	20	pg/g
PCB-161	0.97 U		0.25	20	pg/g
PCB-162	3.4	J	0.40	20	pg/g
PCB-164	23		0.26	20	pg/g
PCB-165	0.97 U		0.22	20	pg/g
PCB-167	24		0.34	2.0	pg/g
PCB-169	0.97 U		0.46	2.0	pg/g
PCB-170	67		0.34	20	pg/g
PCB-171/173	23	C J	0.34	39	pg/g
PCB-172	14	J	0.32	20	pg/g
PCB-174	28		0.39	20	pg/g
PCB-175	0.97 U		0.17	20	pg/g
PCB-176	4.1	J	0.12	20	pg/g
PCB-177	26		0.33	20	pg/g
PCB-178	14	J	0.18	20	pg/g
PCB-179	16	J	0.13	20	pg/g
PCB-180/193	120	C	0.27	39	pg/g
PCB-181	1.3	J	0.27	20	pg/g
PCB-182	0.97 U		0.17	20	pg/g
PCB-183	32		0.21	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	0.97
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	0.97 U		0.14	20	pg/g
PCB-185	3.8	J	0.35	20	pg/g
PCB-186	0.97 U		0.13	20	pg/g
PCB-187	63		0.15	20	pg/g
PCB-188	0.97 U		0.15	20	pg/g
PCB-189	2.8		0.21	20	pg/g
PCB-190	9.1	J ~~JQ~~ EMPC	0.22	20	pg/g
PCB-191	2.3	J ~~JQ~~ EMPC	0.25	20	pg/g
PCB-192	0.97 U		0.26	20	pg/g
PCB-194	21		0.30	20	pg/g
PCB-195	7.2	J	0.31	20	pg/g
PCB-196	9.2	J	0.24	20	pg/g
PCB-197	1.0	J	0.16	20	pg/g
PCB-198/199	29	~~J~~	0.28	39	pg/g
PCB-200	2.1	J ~~JQ~~ EMPC	0.26	20	pg/g
PCB-201	3.5	J	0.19	20	pg/g
PCB-202	8.6	J	0.21	20	pg/g
PCB-203	21		0.27	20	pg/g
PCB-204	0.97 U		0.19	20	pg/g
PCB-205	0.97	J	0.22	20	pg/g
PCB-206	12	J	0.64	20	pg/g
PCB-207	2.0	J ~~JQ~~ EMPC	0.41	20	pg/g
PCB-208	4.8	J	0.39	20	pg/g
PCB-209	5.0	J	0.18	20	pg/g
Total MoCB	1.8		0.24	20	pg/g
Total DiCB	17		1.2	20	pg/g
Total TrCB	130		0.34	20	pg/g
Total TeCB	870		0.38	20	pg/g
Total PeCB	2600		0.60	20	pg/g
Total HxCB	1700		0.46	20	pg/g
Total HpCB	420		0.21	20	pg/g
Total OcCB	100		0.22	20	pg/g
Total NoCB	18		0.64	20	pg/g

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	**Work Order #....:**	MQN86IAD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	47	5.0 - 145
PCB-3L	50	5.0 - 145
PCB-4L	40	5.0 - 145
PCB-19L	45	5.0 - 145
PCB-37L	77	5.0 - 145
PCB-54L	44	5.0 - 145
PCB-77L	85	10 - 145
PCB-81L	85	10 - 145
PCB-104L	56	10 - 145
PCB-105L	82	10 - 145
PCB-114L	79	10 - 145
PCB-118L	82	10 - 145
PCB-123L	81	10 - 145
PCB-126L	83	10 - 145
PCB-155L	75	10 - 145
PCB-156L/157L	107	10 - 145
PCB-167L	107	10 - 145
PCB-169L	99	10 - 145
PCB-188L	83	10 - 145
PCB-189L	102	10 - 145
PCB-202L	86	10 - 145
PCB-205L	86	10 - 145
PCB-206L	81	10 - 145
PCB-208L	89	10 - 145
PCB-209L	76	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	73	5.0 - 145
PCB-178L	77	10 - 145
PCB-111L	79	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	**Work Order #....:**	MQN861AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.97
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result

Q Estimated maximum possible concentration (EMPC)

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	3.0	J	1.4	200	pg/L
PCB-2	10 U		1.4	200	pg/L
PCB-3	10 U		1.5	200	pg/L
PCB-4	25 U		7.7	200	pg/L
PCB-5	10 U		10	200	pg/L
PCB-6	25 U		10	200	pg/L
PCB-7	25 U		9.6	200	pg/L
PCB-8	30 U		10	200	pg/L
PCB-9	25 U		11	200	pg/L
PCB-10	25 U		5.2	200	pg/L
PCB-11	25 U		20	200	pg/L
PCB-12/13	20 U		10	400	pg/L
PCB-14	25 U		8.8	200	pg/L
PCB-15	10 U		9.2	200	pg/L
PCB-16	25 U	J	2.2	200	pg/L
PCB-17	8.0	J	1.8	200	pg/L
PCB-18/30	60 U	~~CJQB~~	1.5	400	pg/L
PCB-19	10 U		2.1	200	pg/L
PCB-20/28	50	J ~~CJB~~	1.7	400	pg/L
PCB-21/33	14	CJ	1.6	400	pg/L
PCB-22	11	J ~~JQB~~ EMPC	1.8	200	pg/L
PCB-23	10 U		1.7	200	pg/L
PCB-24	10 U		1.4	200	pg/L
PCB-25	10 U	J	1.7	200	pg/L
PCB-26/29	20 U	~~CJQ~~	1.7	400	pg/L
PCB-27	10 U		1.3	200	pg/L
PCB-31	38	JB	1.6	200	pg/L
PCB-32	11	J ~~JQ~~ EMPC	1.3	200	pg/L
PCB-34	10 U		1.7	200	pg/L
PCB-35	10 U		1.8	200	pg/L
PCB-36	10 U		1.6	200	pg/L
PCB-37	10 U	J	1.6	200	pg/L
PCB-38	10 U		1.8	200	pg/L
PCB-39	10 U		1.6	200	pg/L
PCB-40/71	23	CJ	2.8	400	pg/L
PCB-41	30 U		4.0	200	pg/L

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	15	J	3.2	200	pg/L
PCB-43	10 U		3.5	200	pg/L
PCB-45	20 U		3.6	200	pg/L
PCB-46	10 U		3.6	200	pg/L
PCB-44/47/65	150	~~C J B~~	2.8	600	pg/L
PCB-48	10 U	~~J Q~~	3.0	200	pg/L
PCB-49/69	140	~~C~~ J	2.5	400	pg/L
PCB-50/53	16	J ~~C J Q~~ EMPC	2.9	400	pg/L
PCB-51	20 U	J	2.7	200	pg/L
PCB-52	430	~~B~~	3.1	200	pg/L
PCB-54	10 U		1.7	200	pg/L
PCB-55	10 U		3.1	200	pg/L
PCB-56	32	J	3.2	200	pg/L
PCB-57	10 U		3.0	200	pg/L
PCB-58	10 U		2.9	200	pg/L
PCB-59/62/75	30 U	~~C~~ J	2.2	600	pg/L
PCB-60	19	J	3.1	200	pg/L
PCB-61/70/74/76	320	~~C~~ J	2.9	800	pg/L
PCB-63	10 U	~~J Q~~	2.7	200	pg/L
PCB-64	49	J	2.1	200	pg/L
PCB-66	140	J	3.0	200	pg/L
PCB-67	10 U		2.8	200	pg/L
PCB-68	10 U		2.7	200	pg/L
PCB-72	10 U		2.8	200	pg/L
PCB-73	10 U		2.3	200	pg/L
PCB-77	4.6	J	2.7	20	pg/L
PCB-78	10 U		3.2	200	pg/L
PCB-79	9.8	J ~~J Q~~ EMPC	2.7	200	pg/L
PCB-80	10 U		2.7	200	pg/L
PCB-81	10 U		2.7	20	pg/L
PCB-82	16	J	3.8	200	pg/L
PCB-83	20 U	~~J~~	3.1	200	pg/L
PCB-84	83	J	3.6	200	pg/L
PCB-85/116/117	75	~~C~~ J	2.5	600	pg/L
PCB-86/87/97/108/119/125	360	~~C~~ J	2.7	1200	pg/L
PCB-88/91	70	~~C~~ J	3.1	400	pg/L

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	10 U		3.4	200	pg/L
PCB-90/101/113	860	C B	2.8	600	pg/L
PCB-92	150	J	3.2	200	pg/L
PCB-93/100	40 U		3.0	400	pg/L
PCB-94	10 U		3.3	200	pg/L
PCB-95	430		3.1	200	pg/L
PCB-96	10 U		1.5	200	pg/L
PCB-98/102	40 U	~~C J Q~~	3.1	400	pg/L
PCB-99	350		2.7	200	pg/L
PCB-103	5.3	J ~~J Q~~ EMPC	2.8	200	pg/L
PCB-104	10 U		1.7	200	pg/L
PCB-105	150		2.1	20	pg/L
PCB-106	20 U		2.9	200	pg/L
PCB-109	41	J	1.9	200	pg/L
PCB-107/124	60 U	C J	2.4	400	pg/L
PCB-110/115	730	C B	2.5	400	pg/L
PCB-111	10 U		2.3	200	pg/L
PCB-112	10 U		3.0	200	pg/L
PCB-114	9.0	J	2.3	20	pg/L
PCB-118	540	B	2.2	20	pg/L
PCB-120	10 U		2.3	200	pg/L
PCB-121	10 U		2.3	200	pg/L
PCB-122	10 U		2.4	200	pg/L
PCB-123	10 U	J	2.4	20	pg/L
PCB-126	10 U		2.4	20	pg/L
PCB-127	10 U		2.4	200	pg/L
PCB-128/166	81	C J	1.5	400	pg/L
PCB-129/138/163	510	C J	1.5	600	pg/L
PCB-130	28	J ~~J Q~~ EMPC	2.0	200	pg/L
PCB-131	10 U		1.9	200	pg/L
PCB-132	110	J	1.9	200	pg/L
PCB-133	8.4	J	1.8	200	pg/L
PCB-134/143	14	J ~~C J Q~~ EMPC	2.0	400	pg/L
PCB-135/151	110	C J	1.7	400	pg/L
PCB-136	43	J	1.3	200	pg/L
PCB-137	19	J	1.3	200	pg/L

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	**Work Order #....:**	MQN9C1AC	**Matrix....:**	WATER
Date Sampled....:	02/06/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/15/12	**Analysis Date....:**	02/17/12		
Prep Batch # ....:	2046094	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	995.32 mL	**Analyst ID....:**	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	20 U	~~C~~ J	1.6	400	pg/L
PCB-141	77	J	2.1	200	pg/L
PCB-142	10 U		2.2	200	pg/L
PCB-144	16	J	1.7	200	pg/L
PCB-145	10 U		1.3	200	pg/L
PCB-146	60	J	1.3	200	pg/L
PCB-147/149	290	~~C~~ J	1.6	400	pg/L
PCB-148	10 U		1.6	200	pg/L
PCB-150	10 U		1.2	200	pg/L
PCB-152	10 U		1.2	200	pg/L
PCB-153/168	390	~~C~~ J	1.3	400	pg/L
PCB-154	10 U	~~J Q~~	1.6	200	pg/L
PCB-155	10 U		1.6	200	pg/L
PCB-156/157	72	~~C~~	2.2	40	pg/L
PCB-158	62	J	1.3	200	pg/L
PCB-159	10 U		2.0	200	pg/L
PCB-160	10 U		1.6	200	pg/L
PCB-161	10 U		1.7	200	pg/L
PCB-162	10 U	~~J~~	2.0	200	pg/L
PCB-164	31	J ~~J Q~~ EMPC	1.7	200	pg/L
PCB-165	10 U		1.4	200	pg/L
PCB-167	28		1.8	20	pg/L
PCB-169	10 U		2.0	20	pg/L
PCB-170	47	J	1.7	200	pg/L
PCB-171/173	13	J ~~C J Q~~ EMPC	1.8	400	pg/L
PCB-172	5.7	J	1.7	200	pg/L
PCB-174	29	J	2.0	200	pg/L
PCB-175	10 U		1.1	200	pg/L
PCB-176	10 U	~~J~~	0.82	200	pg/L
PCB-177	23	J ~~J Q~~ EMPC	1.7	200	pg/L
PCB-178	10 U	~~J Q~~	1.2	200	pg/L
PCB-179	11	J	0.88	200	pg/L
PCB-180/193	73	~~C~~ J	1.4	400	pg/L
PCB-181	10 U		1.4	200	pg/L
PCB-182	10 U		1.1	200	pg/L
PCB-183	17	J	1.1	200	pg/L

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	10 U		0.92	200	pg/L
PCB-185	10 U	~~J Q~~	1.8	200	pg/L
PCB-186	10 U		0.85	200	pg/L
PCB-187	38	J	0.98	200	pg/L
PCB-188	10 U		1.3	200	pg/L
PCB-189	10 U	~~J~~	0.83	20	pg/L
PCB-190	6.2	J	1.2	200	pg/L
PCB-191	10 U		1.3	200	pg/L
PCB-192	10 U		1.3	200	pg/L
PCB-194	8.3	J ~~J Q~~ EMPC	1.3	200	pg/L
PCB-195	10 U	~~J~~	1.3	200	pg/L
PCB-196	10 U		1.1	200	pg/L
PCB-197	10 U		0.72	200	pg/L
PCB-198/199	13	C J	1.2	400	pg/L
PCB-200	20 U		1.2	200	pg/L
PCB-201	10 U	~~J Q~~	0.86	200	pg/L
PCB-202	10 U	~~J~~	1.2	200	pg/L
PCB-203	10 U	~~J Q~~	1.2	200	pg/L
PCB-204	10 U		0.87	200	pg/L
PCB-205	10 U		0.72	200	pg/L
PCB-206	4.7	J ~~J Q~~ EMPC	1.1	200	pg/L
PCB-207	10 U		0.85	200	pg/L
PCB-208	10 U	~~J Q~~	0.90	200	pg/L
PCB-209	10 U		0.52	200	pg/L
Total MoCB	3.0		1.5	200	pg/L
Total DiCB	9.2 U	U	9.2	200	pg/L
Total TrCB	160		1.6	200	pg/L
Total TeCB	1400		2.7	200	pg/L
Total PeCB	3900		2.4	200	pg/L
Total HxCB	2000		2.0	200	pg/L
Total HpCB	280		0.83	200	pg/L
Total OcCB	32		0.72	200	pg/L
Total NoCB	6.5		1.1	200	pg/L

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	**Work Order #....:**	MQN9C1AC	**Matrix....:**	WATER
Date Sampled....:	02/06/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/15/12	**Analysis Date....:**	02/17/12		
Prep Batch # ....:	2046094	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	995.32 mL	**Analyst ID....:**	Lisa L. Hernandez		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	38	5.0 - 145
PCB-3L	42	5.0 - 145
PCB-4L	29	5.0 - 145
PCB-19L	33	5.0 - 145
PCB-37L	60	5.0 - 145
PCB-54L	26	5.0 - 145
PCB-77L	60	10 - 145
PCB-81L	58	10 - 145
PCB-104L	32	10 - 145
PCB-105L	60	10 - 145
PCB-114L	54	10 - 145
PCB-118L	56	10 - 145
PCB-123L	55	10 - 145
PCB-126L	59	10 - 145
PCB-155L	42	10 - 145
PCB-156L/157L	77	10 - 145
PCB-167L	74	10 - 145
PCB-169L	82	10 - 145
PCB-188L	42	10 - 145
PCB-189L	76	10 - 145
PCB-202L	50	10 - 145
PCB-205L	75	10 - 145
PCB-206L	70	10 - 145
PCB-208L	62	10 - 145
PCB-209L	67	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	82	5.0 - 145
PCB-178L	67	10 - 145
PCB-111L	73	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	**Work Order #....:**	MQN9C1AC	**Matrix....:**	WATER
Date Sampled....:	02/06/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/15/12	**Analysis Date....:**	02/17/12		
Prep Batch # ....:	2046094	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	995.32 mL	**Analyst ID....:**	Lisa L. Hernandez		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC)

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	9.8 U		1.2	200	pg/L
PCB-2	9.8 U		1.2	200	pg/L
PCB-3	9.8 U		1.3	200	pg/L
PCB-4	24 U		6.5	200	pg/L
PCB-5	9.8 U		8.2	200	pg/L
PCB-6	24 U		8.4	200	pg/L
PCB-7	24 U		7.9	200	pg/L
PCB-8	29 U		8.3	200	pg/L
PCB-9	24 U		8.9	200	pg/L
PCB-10	24 U		4.6	200	pg/L
PCB-11	40	J	8.6	200	pg/L
PCB-12/13	20 U		8.6	390	pg/L
PCB-14	24 U		7.3	200	pg/L
PCB-15	9.8 U		7.8	200	pg/L
PCB-16	24 U		1.9	200	pg/L
PCB-17	4.0	J	1.6	200	pg/L
PCB-18/30	59 U	~~C J B~~	1.3	390	pg/L
PCB-19	9.8 U		1.6	200	pg/L
PCB-20/28	49	J ~~C J B~~	1.9	390	pg/L
PCB-21/33	20 U	~~C J Q~~	1.8	390	pg/L
PCB-22	6.8	J ~~J Q B~~ EMPC	2.0	200	pg/L
PCB-23	9.8 U		1.8	200	pg/L
PCB-24	9.8 U		1.2	200	pg/L
PCB-25	9.8 U	~~J Q~~	1.9	200	pg/L
PCB-26/29	20 U	~~C J Q~~	1.8	390	pg/L
PCB-27	9.8 U		1.2	200	pg/L
PCB-31	28	J B	1.8	200	pg/L
PCB-32	8.2	J	1.1	200	pg/L
PCB-34	9.8 U		1.9	200	pg/L
PCB-35	9.8 U		2.0	200	pg/L
PCB-36	9.8 U		1.7	200	pg/L
PCB-37	9.8 U	~~J Q~~	2.0	200	pg/L
PCB-38	9.8 U		2.0	200	pg/L
PCB-39	9.8 U		1.8	200	pg/L
PCB-40/71	29 U	~~C J~~	2.4	390	pg/L
PCB-41	29 U		3.4	200	pg/L

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report rpt 3/23/2012

184

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	**Work Order #....:**	MQN9J1AC	**Matrix....:**	WATER
Date Sampled....:	02/06/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/15/12	**Analysis Date....:**	02/17/12		
Prep Batch # ....:	2046094	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	1017.84 mL	**Analyst ID....:**	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	9.8 U		2.7	200	pg/L
PCB-43	9.8 U		3.0	200	pg/L
PCB-45	20 U		3.0	200	pg/L
PCB-46	9.8 U		3.0	200	pg/L
PCB-44/47/65	61	~~C J B~~	2.4	590	pg/L
PCB-48	9.8 U		2.6	200	pg/L
PCB-49/69	45	~~C~~ J	2.1	390	pg/L
PCB-50/53	20 U	~~C J~~	2.4	390	pg/L
PCB-51	20 U		2.3	200	pg/L
PCB-52	150	~~J B~~	2.6	200	pg/L
PCB-54	9.8 U		1.4	200	pg/L
PCB-55	9.8 U		2.7	200	pg/L
PCB-56	22	J	2.8	200	pg/L
PCB-57	9.8 U		2.6	200	pg/L
PCB-58	9.8 U		2.6	200	pg/L
PCB-59/62/75	29 U	~~C J Q~~	1.9	590	pg/L
PCB-60	15	J ~~J Q~~ EMPC	2.7	200	pg/L
PCB-61/70/74/76	200	~~C~~ J	2.6	790	pg/L
PCB-63	9.8 U	~~J Q~~	2.4	200	pg/L
PCB-64	28	J	1.7	200	pg/L
PCB-66	120	J	2.7	200	pg/L
PCB-67	9.8 U		2.5	200	pg/L
PCB-68	9.8 U		2.4	200	pg/L
PCB-72	9.8 U		2.5	200	pg/L
PCB-73	9.8 U		1.9	200	pg/L
PCB-77	9.8 U	~~J Q~~	2.6	20	pg/L
PCB-78	9.8 U		2.9	200	pg/L
PCB-79	9.8 U		2.5	200	pg/L
PCB-80	9.8 U		2.4	200	pg/L
PCB-81	9.8 U		2.7	20	pg/L
PCB-82	9.8 U		3.8	200	pg/L
PCB-83	20 U	~~J~~	3.1	200	pg/L
PCB-84	7.5	J ~~J Q~~ EMPC	3.6	200	pg/L
PCB-85/116/117	42	J ~~C J Q~~ EMPC	2.6	590	pg/L
PCB-86/87/97/108/119/125	88	~~C~~ J	2.8	1200	pg/L
PCB-88/91	17	~~C~~ J	3.1	390	pg/L

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	9.8 U		3.4	200	pg/L
PCB-90/101/113	330	~~C J B~~	2.8	590	pg/L
PCB-92	29	~~J~~	3.3	200	pg/L
PCB-93/100	39 U		3.0	390	pg/L
PCB-94	9.8 U		3.4	200	pg/L
PCB-95	48	J	3.1	200	pg/L
PCB-96	9.8 U		1.4	200	pg/L
PCB-98/102	39 U		3.2	390	pg/L
PCB-99	220		2.8	200	pg/L
PCB-103	9.8 U		2.9	200	pg/L
PCB-104	9.8 U		1.3	200	pg/L
PCB-105	140		2.3	20	pg/L
PCB-106	20 U		3.0	200	pg/L
PCB-109	34	J	2.0	200	pg/L
PCB-107/124	59 U	~~C J~~	2.5	390	pg/L
PCB-110/115	310	~~C J B~~	2.6	390	pg/L
PCB-111	9.8 U		2.3	200	pg/L
PCB-112	9.8 U		3.0	200	pg/L
PCB-114	7.6	J	2.5	20	pg/L
PCB-118	470	~~B~~	2.3	20	pg/L
PCB-120	9.8 U		2.3	200	pg/L
PCB-121	9.8 U		2.3	200	pg/L
PCB-122	9.8 U		2.5	200	pg/L
PCB-123	9.8 U		2.5	20	pg/L
PCB-126	9.8 U		2.7	20	pg/L
PCB-127	9.8 U		2.5	200	pg/L
PCB-128/166	34	~~C J~~	1.5	390	pg/L
PCB-129/138/163	310	~~C J~~	1.5	590	pg/L
PCB-130	7.7	J ~~J Q~~ EMPC	2.1	200	pg/L
PCB-131	9.8 U		1.9	200	pg/L
PCB-132	9.1	J	1.9	200	pg/L
PCB-133	9.8 U		1.9	200	pg/L
PCB-134/143	20 U		2.1	390	pg/L
PCB-135/151	14	~~C~~ J	1.8	390	pg/L
PCB-136	9.8 U		1.4	200	pg/L
PCB-137	9.8 U	~~J Q~~	1.4	200	pg/L

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-139/140	20 U		1.7	390	pg/L
PCB-141	14	J ~~J Q~~ EMPC	2.2	200	pg/L
PCB-142	9.8 U		2.2	200	pg/L
PCB-144	9.8 U	J	1.7	200	pg/L
PCB-145	9.8 U		1.3	200	pg/L
PCB-146	46	J	1.4	200	pg/L
PCB-147/149	87	J	1.7	390	pg/L
PCB-148	9.8 U		1.7	200	pg/L
PCB-150	9.8 U		1.3	200	pg/L
PCB-152	9.8 U		1.2	200	pg/L
PCB-153/168	270	J	1.3	390	pg/L
PCB-154	9.8 U		1.6	200	pg/L
PCB-155	9.8 U		1.4	200	pg/L
PCB-156/157	52	J	2.3	39	pg/L
PCB-158	34	J	1.4	200	pg/L
PCB-159	9.8 U		2.0	200	pg/L
PCB-160	9.8 U		1.7	200	pg/L
PCB-161	9.8 U		1.7	200	pg/L
PCB-162	9.8 U		2.0	200	pg/L
PCB-164	9.8 U	J	1.7	200	pg/L
PCB-165	9.8 U		1.5	200	pg/L
PCB-167	17	J	1.8	20	pg/L
PCB-169	9.8 U		2.1	20	pg/L
PCB-170	18	J ~~J Q~~ EMPC	2.2	200	pg/L
PCB-171/173	20 U		2.2	390	pg/L
PCB-172	9.8 U		2.1	200	pg/L
PCB-174	9.8 U		2.5	200	pg/L
PCB-175	9.8 U		1.1	200	pg/L
PCB-176	9.8 U		0.79	200	pg/L
PCB-177	12	J	2.2	200	pg/L
PCB-178	9.8 U	J	1.1	200	pg/L
PCB-179	9.8 U		0.84	200	pg/L
PCB-180/193	48	J	1.7	390	pg/L
PCB-181	9.8 U		1.8	200	pg/L
PCB-182	9.8 U		1.1	200	pg/L
PCB-183	9.3	J ~~J Q~~ EMPC	1.3	200	pg/L

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	9.8 U		0.88	200	pg/L
PCB-185	9.8 U		2.3	200	pg/L
PCB-186	9.8 U		0.81	200	pg/L
PCB-187	34	J	0.93	200	pg/L
PCB-188	9.8 U		1.2	200	pg/L
PCB-189	9.8 U		1.1	20	pg/L
PCB-190	9.8 U		1.4	200	pg/L
PCB-191	9.8 U		1.6	200	pg/L
PCB-192	9.8 U		1.6	200	pg/L
PCB-194	7.1	J	1.4	200	pg/L
PCB-195	9.8 U		1.4	200	pg/L
PCB-196	9.8 U	J	1.0	200	pg/L
PCB-197	9.8 U		0.68	200	pg/L
PCB-198/199	20 U	C J	1.2	390	pg/L
PCB-200	20 U		1.1	200	pg/L
PCB-201	9.8 U		0.81	200	pg/L
PCB-202	9.8 U		1.2	200	pg/L
PCB-203	9.8 U		1.1	200	pg/L
PCB-204	9.8 U		0.82	200	pg/L
PCB-205	9.8 U		0.75	200	pg/L
PCB-206	9.8 U		1.4	200	pg/L
PCB-207	9.8 U		0.71	200	pg/L
PCB-208	9.8 U		1.4	200	pg/L
PCB-209	9.8 U		0.58	200	pg/L
Total MoCB	1.3 U	U	1.3	200	pg/L
Total DiCB	40		7.8	200	pg/L
Total TrCB	130		2.0	200	pg/L
Total TeCB	660		2.6	200	pg/L
Total PeCB	1800		2.7	200	pg/L
Total HxCB	910		2.1	200	pg/L
Total HpCB	130		1.1	200	pg/L
Total OcCB	20		0.74	200	pg/L
Total NoCB	1.4 U	U	1.4	200	pg/L

\\qsacsql1\QDSApps\WashingtonDOE\WashingtonDOE_EDL_Report.rpt 3/23/2012

188

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	0.98
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	45	5.0 - 145
PCB-3L	47	5.0 - 145
PCB-4L	34	5.0 - 145
PCB-19L	38	5.0 - 145
PCB-37L	59	5.0 - 145
PCB-54L	35	5.0 - 145
PCB-77L	57	10 - 145
PCB-81L	55	10 - 145
PCB-104L	40	10 - 145
PCB-105L	53	10 - 145
PCB-114L	50	10 - 145
PCB-118L	49	10 - 145
PCB-123L	51	10 - 145
PCB-126L	54	10 - 145
PCB-155L	46	10 - 145
PCB-156L/157L	71	10 - 145
PCB-167L	65	10 - 145
PCB-169L	71	10 - 145
PCB-188L	42	10 - 145
PCB-189L	68	10 - 145
PCB-202L	46	10 - 145
PCB-205L	67	10 - 145
PCB-206L	67	10 - 145
PCB-208L	58	10 - 145
PCB-209L	64	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	81	5.0 - 145
PCB-178L	68	10 - 145
PCB-111L	68	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	**Work Order #....:**	MQN9J1AC	**Matrix....:**	WATER
Date Sampled....:	02/06/12	**Date Received....:**	02/08/12	**Dilution Factor:**	0.98
Prep Date....:	02/15/12	**Analysis Date....:**	02/17/12		
Prep Batch # ....:	2046094	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	1017.84 mL	**Analyst ID....:**	Lisa L. Hernandez		

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

Sample Results

Sample	Analyte	Fraction	Result	Qualifier	MDL	LOD	MRL	Unit	Batch	Sequence
HB- Crab										
1205028-22	Pb	N/A	0.0004	U	0.0002	0.0004	0.002	mg/kg	B120198	1200096
1205028-22	Tl	N/A	0.0002	U	0.0001	0.0002	0.0004	mg/kg	B120198	1200096
1205028-22	Zn	N/A	0.04	U	0.01	0.04	0.05	mg/kg	B120198	1200096
HB- Fish										
1205028-21	Pb	N/A	0.0004	U	0.0002	0.0004	0.002	mg/kg	B120198	1200096
1205028-21	Tl	N/A	0.0002	U	0.0001	0.0002	0.0004	mg/kg	B120198	1200096
1205028-21	Zn	N/A	0.04	U	0.01	0.04	0.05	mg/kg	B120198	1200096
VWW06-CRB01-0112										
1205028-11	%TS	N/A	35.83		0.06		0.21	%	B120240	N/A
1205028-11	Pb	N/A	5.14		0.004	0.007	0.037	mg/kg	B120198	1200096
1205028-11	Tl	N/A	0.004	U	0.002	0.004	0.007	mg/kg	B120198	1200096
1205028-11	Zn	N/A	21.6		0.26	0.67	0.93	mg/kg	B120198	1200096
VWW06-CRB01P-0112										
1205028-12	%TS	N/A	31.24		0.06		0.21	%	B120240	N/A
1205028-12	Pb	N/A	4.12		0.004	0.007	0.037	mg/kg	B120198	1200096
1205028-12	Tl	N/A	0.004	U	0.002	0.004	0.007	mg/kg	B120198	1200096
1205028-12	Zn	N/A	20.3		0.26	0.67	0.92	mg/kg	B120198	1200096
VWW06-CRB02-0112										
1205028-13	%TS	N/A	34.76		0.06		0.21	%	B120240	N/A
1205028-13	Pb	N/A	3.55		0.004	0.007	0.037	mg/kg	B120198	1200096
1205028-13	Tl	N/A	0.004	U	0.002	0.004	0.007	mg/kg	B120198	1200096
1205028-13	Zn	N/A	19.3		0.26	0.66	0.92	mg/kg	B120198	1200096
VWW06-CRB03-0112										
1205028-14	%TS	N/A	35.35		0.06		0.21	%	B120240	N/A
1205028-14	Pb	N/A	2.07		0.004	0.008	0.040	mg/kg	B120198	1200096
1205028-14	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-14	Zn	N/A	26.4		0.28	0.71	0.99	mg/kg	B120198	1200096

4/10/12

Sample Results

Sample	Analyte	Fraction	Result	Qualifier	MDL	LOD	MRL	Unit	Batch	Sequence
VWW06-CRB04-0112										
1205028-15	%TS	N/A	34.35		0.06		0.21	%	B120240	N/A
1205028-15	Pb	N/A	2.15		0.004	0.008	0.042	mg/kg	B120198	1200096
1205028-15	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-15	Zn	N/A	26.6		0.29	0.75	1.04	mg/kg	B120198	1200096
VWW06-CRB05-0212										
1205028-16	%TS	N/A	34.32		0.06		0.21	%	B120240	N/A
1205028-16	Pb	N/A	0.033	J ~~B~~	0.004	0.008	0.040	mg/kg	B120198	1200096
1205028-16	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-16	Zn	N/A	19.0		0.28	0.71	0.99	mg/kg	B120198	1200096
VWW06-CRB05P-0212										
1205028-17	%TS	N/A	37.28		0.06		0.21	%	B120240	N/A
1205028-17	Pb	N/A	0.037	J ~~B~~	0.004	0.007	0.037	mg/kg	B120198	1200096
1205028-17	Tl	N/A	0.004	U	0.002	0.004	0.007	mg/kg	B120198	1200096
1205028-17	Zn	N/A	19.2		0.26	0.67	0.92	mg/kg	B120198	1200096
VWW06-CRB06-0112										
1205028-18	%TS	N/A	40.59		0.06		0.21	%	B120240	N/A
1205028-18	Pb	N/A	0.022	J ~~B~~	0.004	0.007	0.037	mg/kg	B120198	1200096
1205028-18	Tl	N/A	0.004	U	0.002	0.004	0.007	mg/kg	B120198	1200096
1205028-18	Zn	N/A	13.8		0.26	0.66	0.92	mg/kg	B120198	1200096
VWW06-CRB07-0112										
1205028-19	%TS	N/A	33.38		0.06		0.21	%	B120240	N/A
1205028-19	Pb	N/A	0.066		0.004	0.008	0.039	mg/kg	B120198	1200096
1205028-19	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-19	Zn	N/A	20.7		0.27	0.70	0.97	mg/kg	B120198	1200096
VWW06-CRB08-0112										
1205028-20	%TS	N/A	36.47		0.06		0.21	%	B120240	N/A
1205028-20	Pb	N/A	0.053		0.004	0.008	0.040	mg/kg	B120198	1200096
1205028-20	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-20	Zn	N/A	13.7		0.28	0.71	0.99	mg/kg	B120198	1200096

4/10/12

192

Sample Results

Sample	Analyte	Fraction	Result	Qualifier	MDL	LOD	MRL	Unit	Batch	Sequence
VWW06-FS01-0112										
1205028-01	%TS	N/A	29.99		0.06		0.21	%	B120240	N/A
1205028-01	Pb	N/A	0.097	J FD	0.004	0.008	0.040	mg/kg	B120198	1200096
1205028-01	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-01	Zn	N/A	16.9	J FD	0.28	0.71	0.99	mg/kg	B120198	1200096
VWW06-FS01P-0112										
1205028-02	%TS	N/A	28.38		0.06		0.21	%	B120240	N/A
1205028-02	Pb	N/A	0.055	J FD	0.004	0.008	0.040	mg/kg	B120198	1200096
1205028-02	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-02	Zn	N/A	10.8	J FD	0.28	0.72	1.00	mg/kg	B120198	1200096
VWW06-FS02-0212										
1205028-03	%TS	N/A	23.40		0.06		0.21	%	B120240	N/A
1205028-03	Pb	N/A	0.057		0.004	0.008	0.039	mg/kg	B120198	1200096
1205028-03	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-03	Zn	N/A	16.1		0.28	0.71	0.98	mg/kg	B120198	1200096
VWW06-FS03-0212										
1205028-04	%TS	N/A	33.12		0.06		0.21	%	B120240	N/A
1205028-04	Pb	N/A	1.65	J M LD	0.004	0.008	0.038	mg/kg	B120198	1200096
1205028-04	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-04	Zn	N/A	15.5		0.27	0.69	0.95	mg/kg	B120198	1200096
VWW06-FS04-0112										
1205028-05	%TS	N/A	22.49		0.06		0.21	%	B120240	N/A
1205028-05	Pb	N/A	0.271		0.004	0.008	0.038	mg/kg	B120198	1200096
1205028-05	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-05	Zn	N/A	13.5		0.26	0.68	0.95	mg/kg	B120198	1200096
VWW06-FS05-0212										
1205028-06	%TS	N/A	24.33		0.06		0.21	%	B120240	N/A
1205028-06	Pb	N/A	0.008	U	0.004	0.008	0.038	mg/kg	B120198	1200096
1205028-06	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-06	Zn	N/A	11.3		0.26	0.68	0.94	mg/kg	B120198	1200096

4/10/12

193

Sample Results

Sample	Analyte	Fraction	Result	Qualifier	MDL	LOD	MRL	Unit	Batch	Sequence
VWW06-FS05P-0212										
1205028-07	%TS	N/A	27.12		0.06		0.21	%	B120240	N/A
1205028-07	Pb	N/A	0.008	U	0.004	0.008	0.038	mg/kg	B120198	1200096
1205028-07	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-07	Zn	N/A	10.1		0.27	0.69	0.95	mg/kg	B120198	1200096
VWW06-FS06-0112										
1205028-08	%TS	N/A	27.00		0.06		0.21	%	B120240	N/A
1205028-08	Pb	N/A	0.008	U	0.004	0.008	0.040	mg/kg	B120198	1200096
1205028-08	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-08	Zn	N/A	13.2		0.28	0.73	1.01	mg/kg	B120198	1200096
VWW06-FS07-0112										
1205028-09	%TS	N/A	37.66		0.06		0.21	%	B120240	N/A
1205028-09	Pb	N/A	0.017	J M B LD	0.004	0.008	0.039	mg/kg	B120198	1200096
1205028-09	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-09	Zn	N/A	15.2	J M MSH	0.27	0.70	0.97	mg/kg	B120198	1200096
VWW06-FS08-0212										
1205028-10	%TS	N/A	48.73		0.06		0.21	%	B120240	N/A
1205028-10	Pb	N/A	0.020	J B	0.004	0.008	0.039	mg/kg	B120198	1200096
1205028-10	Tl	N/A	0.004	U	0.002	0.004	0.008	mg/kg	B120198	1200096
1205028-10	Zn	N/A	16.4		0.28	0.71	0.98	mg/kg	B120198	1200096

4/10/12

194

CHAIN OF CUSTODY DOCUMENTS

G2B080439 Revised 2 3-28-2012

BROOKS RAND LABS
MEANINGFUL METALS DATA
3958 6th Avenue NW
Seattle, WA 98107
Phone: 206-632-6206
Fax: 206-632-6017
samples@brooksrand.com
www.brooksrand.com

Chain of Custody Record

COPY

1205028

G2B080439

White: LAB COPY
Yellow: CUSTOMER COPY

Client: CH2M HILL	Address:	COC receipt confirmation? Y / N If so, by: email / fax (circle one)
Contact: JOHN SWENFURTH		Email:
Client project ID: SWMU 6		
PO #:	Phone #:	Fax #:

Requested TAT in business days:
☐ 20 (standard)
☐ 15
☐ 10
☐ 5
☐ Other ____

Surcharges apply for expedited turn around times.

	Sample ID	Collection: Date	Collection: Time	Misc: Sampler (initials)	Misc: Matrix type	Misc: # of containers	Misc: Field filtered? (Y/N)	Field Preservation: Unpreserved / ice only	Field Preservation: HCl / HNO_3 (circle one)	Field Preservation: Other (specify) Frozen	Analyses required: Total Hg, EPA 1631	Analyses required: Methyl Hg, EPA 1630	Analyses required: ICP-MS Metals (specify)	Analyses required: As / Se species (specify)	Analyses required: ~~% Solids~~ METALS	Analyses required: ~~Filtration~~ PCB CONG	Analyses required: Other (specify) WCHEM	Analyses required: Other (specify)	Comments
1	VWW06-FS01-0112	1/31/12	-	JRM	FISH	1				✓					✓	✓	✓		
2	VWW06-FS01P-0112	1/31/12	-	JRM	FISH	1				✓					✓	✓	✓		
3	VWW06-FS02-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
4	VWW06-FS03-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
5	VWW06-FS03-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		RUN QA/QC
6	VWW06-FS03-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
7	VWW06-FS04-0112	1/31/12	-	JRM	FISH	1				✓					✓	✓	✓		
8	VWW06-FS05-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
9	VWW06-FS05P-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
10	VWW06-FS06-0112	1/31/12	-	JRM	FISH	1				✓					✓	✓	✓		

Relinquished by:	Date: 2/2/12	Time: 1200	Relinquished by:	Date: 2/7/12	Time: 1400
Received by:	Date: 2-8-12	Time: 1145	Received at BRL by:	Date: 2/8/12	Time: 0830
Shipping carrier: FED EX	# of coolers: 1		BRL work order ID:	BRL project ID:	

G2B080439 Revised 2 3-28-2012

TestAmerica West Sacramento (916) 373-5600

BROOKS RAND LABS
MEANINGFUL METALS DATA
3958 6th Avenue NW
Seattle, WA 98107
Phone: 206-632-6206
Fax: 206-632-6017
samples@brooksrand.com
www.brooksrand.com

Chain of Custody Record

1205028

COPY

G2B080439

White: LAB COPY
Yellow: CUSTOMER COPY

Client: CH2M HILL	Address:	COC receipt confirmation? Y / N If so, by: email / fax (circle one)
Contact: JOHN SWONFORTH		Email:
Client project ID: SWMU 6		
PO #:	Phone #:	Fax #:

Requested TAT in business days:
- ☐ 20 (standard)
- ☐ 15
- ☐ 10
- ☐ 5
- ☐ Other ____

Surcharges apply for expedited turn around times.

	Sample ID	Collection: Date	Collection: Time	Misc: Sampler (initials)	Misc: Matrix type	Misc: # of containers	Misc: Field filtered? (Y/N)	Field Preservation: Unpreserved / ice only	Field Preservation: HCl / HNO_3 (circle one)	Field Preservation: Other (specify) FROZEN	Analyses required: Total Hg, EPA 1631	Analyses required: Methyl Hg, EPA 1630	Analyses required: ICP-MS Metals (specify)	Analyses required: As / Se species (specify)	Analyses required: ~~% Solids~~ METALS	Analyses required: ~~Filtration~~ PCB CONG	Analyses required: Other (specify) WCHEM	Analyses required: Other (specify)	Comments
1	VWW06-FS07-0112	1/31/12	—	JRM	FISH	1				✓					✓	✓	✓		RUN QA/QC
2	VWW06-FS07-0112	1/31/12	—	JRM	FISH	1				✓					✓	✓	✓		
3	VWW06-FS07-0112	1/31/12	—	JRM	FISH	1				✓					✓	✓	✓		
10	4 VWW06-FS08-0112	1/31/12	—	JRM	FISH	1				✓					✓	✓	✓		
11	5 VWW06-CRB01-0112	1/31/12	—	JRM	CRAB	1				✓					✓	✓	✓		
12	6 VWW06-CRB01P-0112	1/31/12	—	JRM	CRAB	1				✓					✓	✓	✓		
13	7 VWW06-CRB02-0112	1/31/12	—	JRM	CRAB	1				✓					✓	✓	✓		
8	VWW06-CRB03-0112	1/31/12	—	JRM	CRAB	1				✓					✓	✓	✓		
4	9 VWW06-CRB03-0112	1/31/12	—	JRM	CRAB	1				✓					✓	✓	✓		RUN QA/QC
10	VWW06-CRB03-0112	1/31/12	—	JRM	CRAB	1				✓					✓	✓	✓		

Relinquished by: John R Martin	Date: 2/2/12	Time: 1200	Relinquished by:	Date: 2/7/12	Time: 1400
Received by:	Date: 2-8-12	Time: 1145	Received at BRL by:	Date: 2/8/12	Time: 0830
Shipping carrier: FED EX	# of coolers: 1		BRL work order ID:	BRL project ID:	

G2B080439 Revised 2 3-28-2012

TestAmerica West Sacramento (916) 373-5600

BROOKS RAND LABS
MEANINGFUL METALS DATA
3958 6th Avenue NW
Seattle, WA 98107
Phone: 206-632-6206
Fax: 206-632-6017
samples@brooksrand.com
www.brooksrand.com

Chain of Custody Record

COPY

1205028

G2B080439

White: LAB COPY
Yellow: CUSTOMER COPY

Client: CH2M HILL	Address:	COC receipt confirmation? Y / N If so, by: email / fax (circle one)
Contact: JOHN SWENFURTH		Email:
Client project ID: SWMU 6		Fax #:
PO #:	Phone #:	

Requested TAT in business days:
☐ 20 (standard)
☐ 15
☐ 10
☐ 5
☐ Other ____

Surcharges apply for expedited turn around times.

	Sample ID	Collection: Date	Collection: Time	Misc: Sampler (initials)	Misc: Matrix type	Misc: # of containers	Misc: Field filtered? (Y/N)	Field Preservation: Unpreserved / ice only	Field Preservation: HCl / HNO_3 (circle one)	Field Preservation: Other (specify) FROZEN	Analyses required: Total Hg, EPA 1631	Analyses required: Methyl Hg, EPA 1630	Analyses required: ICP-MS Metals (specify)	Analyses required: As / Se species (specify)	Analyses required: ~~% Solids~~ METALS	Analyses required: Filtration PCB CONG	Analyses required: Other (specify) W CHEM	Analyses required: Other (specify)	Comments
1	VWW06-CRB04-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
2	VWW06-CRB05-0112	~~1/31/12~~	2/1/12	JRM	GRAB	1				✓					✓	✓	✓		
3	VWW06-CRB05P-0112	~~1/31/12~~	2/1/12	JRM	GRAB	1				✓					✓	✓	✓		
4	VWW06-CRB06-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
5	VWW06-CRB07-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		RUN QA/QC
6	VWW06-CRB07-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
7	VWW06-CRB07-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
8	VWW06-CRB08-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
9	Homogenization Blank-Fish	2/6/12	1645	CCE	DIW	1													
10	↓ -Crab	↓ 2/1/12	1330	↓	↓	1													

Relinquished by:	Date: 2/2/12	Time: 1200	Relinquished by: Date: 2/7/12 Time: 1400
Received by:	Date: 2-8-12	Time: 1145	Received at BRL by: Date: 2/8/12 Time: 0830
Shipping carrier: FED EX	# of coolers: 1		BRL work order ID: BRL project ID:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

LOT RECEIPT CHECKLIST
TestAmerica West Sacramento

CLIENT CH2MHILL PM KS

LOT# (QUANTIMS ID) G2B080439 QUOTE# 90020 LOCATION F-10E W19B

DATE RECEIVED 2/8/12 TIME RECEIVED 9:00 Checked (✓) ☑

DELIVERED BY ☑ FEDEX ☐ ON TRAC ☐ OTHER

☐ GOLDENSTATE ☐ UPS ☐ EZ PARCEL

☐ TAL COURIER ☐ TAL SF ☐ CLIENT ☑

SHIPPPING CONTAINER(S) ☑ TAL ☐ CLIENT ☐ N/A

MULIT-COOLER(S) (If checked see multi-cooler form) ☑

SINGLE COOLER INFORMATION N/A

CUSTODY SEAL STATUS ☐ INTACT ☐ BROKEN ☐ N/A ☑ ☐

CUSTODY SEAL #(S) _____

COC #(S)_____ ☑ ☐

TEMPERATURE BLANK Observed:_____ Corrected:_____

SAMPLE TEMPERATURE - (TEMPERATURES ARE IN °C)

Observed:_____ Average_____ Corrected Average_____

LABORATORY THERMOMETER ID:

IR UNIT: #4 ☐ #5☐ ☐ OTHER_____ ☑ ☐

CH Initials 2/8/12 Date

---

pH MEASURED ☐ YES ☐ ANOMALY ☑ N/A ☑

LABELED BY..... CH ☑

LOGGED IN BY..... CH ☑

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING ☑

WETCHEM ☑ N/A ☑

VOA-ENCORES ☑ N/A ☑

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☑ N/A ☑

☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A ☑

☐ CLOUSEAU ☐ TEMPERATURE EXCEEDED (0 °C – 6 °C)*1 ☑ N/A

☑ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED

CH Initials 2/8/12 Date

Notes_____

*1 Acceptable temperature range for State of Wisconsin samples is ≤4°C.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

MULTI COOLER RECEIPT CHECKLIST
TestAmerica West Sacramento

CLIENT: CH2MHILL LOT# (QUANTIMS ID): G2B080439

Checked (✓)

COOLER ID **AIRBILL/TRACKING #** 793203241978 ☑

CUSTODY SEAL STATUS ☑ INTACT ☐ BROKEN ☐ N/A ☑

CUSTODY SEAL #(S) SEAL ☑

COC #(S) NA

SHIPPPING CONTAINER(S) ☑ TAL ☐ CLIENT ☐ N/A ☑

TEMPERATURE BLANK: OBSERVED: NA CORRECTED NA ☑

SAMPLE TEMPERATURE:

OBSERVED: 1,2 AVERAGE: 2 CORRECTED 2 ☑

SAMPLES / TESTS (IF NCM REQUIRED): WATERS ☑

LABORATORY THERMOMETER ID:

IR UNIT: #4☑ #5☐ ☐ OTHER

COOLER ID **AIRBILL/TRACKING #** 793203241945 ☑ Initials CH

CUSTODY SEAL STATUS ☑ INTACT ☐ BROKEN ☐ N/A ☑

CUSTODY SEAL #(S) SEAL ☑

COC #(S) NA

SHIPPPING CONTAINER(S) ☑ TAL ☐ CLIENT ☐ N/A ☑

TEMPERATURE BLANK: OBSERVED: NA CORRECTED NA ☑

SAMPLE TEMPERATURE:

OBSERVED: -7,-8,-9 AVERAGE: -8 CORRECTED -8 ☑

SAMPLES / TESTS (IF NCM REQUIRED): ONE BAG OF DRY ICE ☑

LABORATORY THERMOMETER ID:

IR UNIT: #4☑ #5☐ ☐ OTHER ☑

COOLER ID **AIRBILL/TRACKING #** ☐ Initials CH

CUSTODY SEAL STATUS ☐ INTACT ☐ BROKEN ☐ N/A ☐

CUSTODY SEAL #(S) ☐

COC #(S)

SHIPPPING CONTAINER(S) ☐ TAL ☐ CLIENT ☐ N/A ☐

TEMPERATURE BLANK: OBSERVED: CORRECTED ☐

SAMPLE TEMPERATURE:

OBSERVED: AVERAGE: CORRECTED ☐

SAMPLES / TESTS (IF NCM REQUIRED): ☐

LABORATORY THERMOMETER ID:

IR UNIT: #4☐ #5☐ ☐ OTHER ☐

CH 2/8/12

Initials **Date**

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Bottle Lot Inventory

Lot ID: G2B080439

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VOA*																				
VOAh*																				
VOAmeoh																				
AGB																				
AGBs																				
250AGB																				
250AGBs																				
250AGBn																				
500AGB																				
____AGJ																				
500AGJ																				
250AGJ																				
125AGJ	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
125AGJmeoh																				
____CGJ																				
500CGJ																				
250CGJ																				
125CGJ																				
PJ																				
PJn																				
500PJ																				
500PJn																				
500PJna																				
500PJzn/na																				
250PJ																				
250PJn																				
250PJna																				
250PJzn/na																				
Acetate Tube																				
____"CT																				
Encore																				
Folder/filter																				
PUF																				
Petri/Filter																				
XAD Trap																				
Ziploc																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

h = hydrochloric acid **s** = sulfuric acid **na** = sodium hydroxide **n** = nitric acid **zn** = zinc acetate

Number of VOAs with air bubbles present / total number of VOA's

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Bottle Lot Inventory

Lot ID: G2B080439

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
VOA*																				
VOAh*																				
VOAmeoh																				
AGB	1	1																		
AGBs																				
250AGB																				
250AGBs																				
250AGBn																				
500AGB																				
____AGJ																				
500AGJ																				
250AGJ																				
125AGJ																				
125AGJmeoh																				
____CGJ																				
500CGJ																				
250CGJ																				
125CGJ																				
PJ																				
PJn																				
500PJ																				
500PJn																				
500PJna																				
500PJzn/na																				
250PJ																				
250PJn																				
250PJna																				
250PJzn/na																				
Acetate Tube																				
_____"CT																				
Encore																				
Folder/filter																				
PUF																				
Petri/Filter																				
XAD Trap																				
Ziploc																				
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

h = hydrochloric acid **s** = sulfuric acid **na** = sodium hydroxide n = nitric acid **zn** = zinc acetate

Number of VOAs with air bubbles present / total number of VOA's

From: (206) 632-6206
Shipping
BROOKS RAND LLC
3958 6TH AVE NW

SEATTLE, WA 98107

Origin ID: BFIA

FedEx Express

J1210111219022S

Ship Date: 07FEB12
ActWgt: 22.0 LB
CAD: 5919366/INET3250

Delivery Address Bar Code

SHIP TO: (206) 632-6206
Karen Sellers
Test America
880 RIVERSIDE PKWY

WEST SACRAMENTO, CA 95605

BILL SENDER

Ref # TA Crab and Fish Samples
Invoice #
PO #
Dept #

2 of 2

MPS# 7932 0324 1978
0263

Mstr# 7932 0324 1945 0201

WED - 08 FEB A1
STANDARD OVERNIGHT

95605
CA-US
SMF

WD BLUA

512G1/BF58/A278

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $500, e g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide

203

From: (206) 632-6206
Shipping
BROOKS RAND LLC
3958 6TH AVE NW

SEATTLE, WA 98107

Origin ID: BFIA

FedEx Express

J12101112190225

Ship Date: 07FEB12
ActWgt: 23.0 LB
CAD: 5919366/INET3250

Delivery Address Bar Code

SHIP TO: (206) 632-6206 BILL SENDER

Karen Sellers
Test America
880 RIVERSIDE PKWY

WEST SACRAMENTO, CA 95605

Ref # TA Crab and Fish Samples
Invoice #
PO #
Dept #

1 of 2

WED - 08 FEB A1
STANDARD OVERNIGHT

TRK# **7932 0324 1945**
0201

MASTER

WD BLUA

95605
CA-US
SMF

512G1/9F59/A278

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide

MEMORANDUM **CH2MHILL**

Corrections to COCs

TO: Karen Sellers, Test America.

COPIES: File
Data Validation Package
Laboratory Package SDG: G2B080439

FROM: Hillary Ott
Project Data Manager

DATE: February 14, 2012

This memo is to document corrections made to entries on the Chains of Custody (COC) and Logins for Vieques, SWMU 6, Tissue.

The corrections include changes to the sample IDs on the COC and Login:

	Incorrect Sample IDs	Corrected Sample IDs	Date Collected	SDG
-3	VWW06-FS02-0112	VWW06-FS02-0212	2/1/2012	G2B080439
-4	VWW06-FS03-0112	VWW06-FS03-0212	2/1/2012	G2B080439
-6	VWW06-FS05-0112	VWW06-FS05-0212	2/1/2012	G2B080439
-7	VWW06-FS05P-0112	VWW06-FS05P-0212	2/1/2012	G2B080439
-10	VWW06-FS08-0112	VWW06-FS08-0212	2/1/2012	G2B080439
-16	VWW06-CRB05-0112	VWW06-CRB05-0212	2/1/2012	G2B080439
-17	VWW06-CRB05P-0112	VWW06-CRB05P-0212	2/1/2012	G2B080439

Project ID: CHM-CH1201
PM: Tiffany Stilwater

BROOKS RAND LABS
MEANINGFUL METALS DATA

Client PM: Hillary Ott
Client PO: 946759

Sample Containers

Lab ID: 1205028-22
Sample: HB- Crab

Report Matrix: DIW
Sample Type: Homog Blank

Collected: 02/06/2012
Received: 02/03/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle HDPE ICP-W	125 mL	12-007	1.0% HNO3 (BRL)	1152040	<2	Cooler

Shipping Containers

Cooler

Received: February 3, 2012 8:30
Tracking No: 5177 7575 1739 via FedEx
Coolant Type: Dry Ice
Temperature: -5.3 °C

Description: Cooler
Damaged in transit? No
Returned to client? No

Custody seals present? Yes
Custody seals intact? Yes
COC present? Yes

206

BROOKS RAND LABS
MEANINGFUL METALS DATA
3958 6th Avenue NW
Seattle, WA 98107
Phone: 206-632-6206
Fax: 206-632-6017
samples@brooksrand.com
www.brooksrand.com

Chain of Custody Record

1205028

BRL Report 1205028 Rev.1

White: LAB COPY
Yellow: CUSTOMER COPY

Client: CH2M HILL	Address:	COC receipt confirmation? Y / N If so, by: email / fax (circle one)
Contact: JOHN SWENFURTH		Email:
Client project ID: SWMU 6		
PO #:	Phone #:	Fax #:

Requested TAT in business days:
☐ 20 (standard)
☐ 15
☐ 10
☐ 5
☐ Other ____
Surcharges apply for expedited turn around times.

	Sample ID	Collection: Date	Collection: Time	Misc: Sampler (initials)	Misc: Matrix type	Misc: # of containers	Misc: Field filtered? (Y/N)	Field Preservation: Unpreserved / ice only	Field Preservation: HCl / HNO_3 (circle one)	Field Preservation: Other (specify) Frozen	Analyses required: Total Hg, EPA 1631	Analyses required: Methyl Hg, EPA 1630	Analyses required: ICP-MS Metals (specify)	Analyses required: As / Se species (specify)	Analyses required: ~~% Solids~~ METALS	Analyses required: ~~Filtration~~ PCB CONG	Analyses required: Other (specify) WCHEM	Analyses required: Other (specify)	Comments
1	VWW06-FS01-0112	1/31/12	-	JRM	FISH	1				✓					✓	✓	✓		
2	VWW06-FS01P-0112	1/31/12	-	JRM	FISH	1				✓					✓	✓	✓		
3	VWW06-FS02-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
4	VWW06-FS03-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
5	VWW06-FS03-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		> RUN QA/QC
6	VWW06-FS03-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
7	VWW06-FS04-0112	1/31/12	-	JRM	FISH	1				✓					✓	✓	✓		
8	VWW06-FS05-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
9	VWW06-FS05P-0112	2/1/12	-	JRM	FISH	1				✓					✓	✓	✓		
10	VWW06-FS06-0112	1/31/12	-	JRM	FISH	1				✓					✓	✓	✓		

Relinquished by: John N Martin	Date: 2/2/12	Time: 1200	Relinquished by:
Received by:	Date:	Time:	Received at BRL by: Date: 2/3/12 Time: 0830
Shipping carrier: FED EX	# of coolers: 1		BRL work order ID: BRL project ID:

BROOKS RAND LABS
MEANINGFUL METALS DATA
3958 6th Avenue NW
Seattle, WA 98107
Phone: 206-632-6206
Fax: 206-632-6017
samples@brooksrand.com
www.brooksrand.com

Chain of Custody Record

BRL Report #1205028, Rev.1

1205028

White: LAB COPY
Yellow: CUSTOMER COPY

Client: CH2M HILL	Address:	COC receipt confirmation? Y / N If so, by: email / fax (circle one)
Contact: JOHN SWENFORTH		Email:
Client project ID: SUMU 6		
PO #:	Phone #:	Fax #:

Requested TAT in business days:
☐ 20 (standard)
☐ 15
☐ 10
☐ 5
☐ Other ____

Surcharges apply for expedited turn around times.

	Sample ID	Collection: Date	Collection: Time	Misc: Sampler (initials)	Misc: Matrix type	Misc: # of containers	Misc: Field filtered? (Y/N)	Field Preservation: Unpreserved / ice only	Field Preservation: HCl / HNO_3 (circle one)	Field Preservation: Other (specify) FROZEN	Analyses required: Total Hg, EPA 1631	Analyses required: Methyl Hg, EPA 1630	Analyses required: ICP-MS Metals (specify)	Analyses required: As / Se species (specify)	Analyses required: ~~% Solids~~ METALS	Analyses required: ~~Filtration~~ PCB CONG	Analyses required: Other (specify) WCHEM	Analyses required: Other (specify)	Comments
1	VWW06-FS07-0112	1/31/12	–	JRM	FISH	1				✓					✓	✓	✓		
2	VWW06-FS07-0112	1/31/12	–	JRM	FISH	1				✓					✓	✓	✓		RUN QA/QC
3	VWW06-FS07-0112	1/31/12	–	JRM	FISH	1				✓					✓	✓	✓		
4	VWW06-FS08-0112	2/1/12	–	JRM	FISH	1				✓					✓	✓	✓		
5	VWW06-CRB01-0112	1/31/12	–	JRM	CRAB	1				✓					✓	✓	✓		
6	VWW06-CRB01P-0112	1/31/12	–	JRM	CRAB	1				✓					✓	✓	✓		
7	VWW06-CRB02-0112	1/31/12	–	JRM	CRAB	1				✓					✓	✓	✓		
8	VWW06-CRB03-0112	1/31/12	–	JRM	CRAB	1				✓					✓	✓	✓		
9	VWW06-CRB03-0112	1/31/12	–	JRM	CRAB	1				✓					✓	✓	✓		RUN QA/QC
10	VWW06-CRB03-0112	1/31/12	–	JRM	CRAB	1				✓					✓	✓	✓		

Relinquished by: [signature]	Date: 2/2/12	Time: 1200	Relinquished by:
Received by:	Date:	Time:	Received at BRL by: [signature]
Shipping carrier: FED EX	# of coolers: 1		BRL work order ID:

Date: | Time:
Date: 2/3/12 | Time: 0830
BRL project ID:

BROOKS RAND LABS
MEANINGFUL METALS DATA
3958 6th Avenue NW
Seattle, WA 98107
Phone: 206-632-6206
Fax: 206-632-6017
samples@brooksrand.com
www.brooksrand.com

Chain of Custody Record

BRL Report 1205028, Rev.1

1205028

White: LAB COPY
Yellow: CUSTOMER COPY

Client: CH2M HILL	Address:	COC receipt confirmation? Y / N If so, by: email / fax (circle one)
Contact: JOHN SUENFORTH		Email:
Client project ID: SWMU 6		
PO #:	Phone #:	Fax #:

Requested TAT in business days:
☐ 20 (standard)
☐☐ 15
☐☐ 10
☐☐ 5
☐ Other ____
Surcharges apply for expedited turn around times.

	Sample ID	Collection: Date	Collection: Time	Misc: Sampler (initials)	Misc: Matrix type	Misc: # of containers	Misc: Field filtered? (Y/N)	Field Preservation: Unpreserved / ice only	Field Preservation: HCl / HNO_3 (circle one)	Field Preservation: Other (specify)	Analyses required: Total Hg, EPA 1631	Analyses required: Methyl Hg, EPA 1630	Analyses required: ICP-MS Metals (specify)	Analyses required: As / Se species (specify)	Analyses required: ~~% Solids~~ METALS	Analyses required: Filtration PCB CONG	Analyses required: Other (specify) W CHEM	Analyses required: Other (specify)	Comments
1	VWW06-CRB04-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
2	VWW06-CRB05-0112	~~1/31/12~~ 2/1/12	– JRM	JRM	GRAB	1				✓					✓	✓	✓		
3	VWW06-CRB05P-0112	~~1/31/12~~ 2/1/12	– JRM	JRM	GRAB	1				✓					✓	✓	✓		
4	VWW06-CRB06-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
5	VWW06-CRB07-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		RUN QA/QC
6	VWW06-CRB07-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
7	VWW06-CRB07-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
8	VWW06-CRB08-0112	1/31/12	–	JRM	GRAB	1				✓					✓	✓	✓		
9																			
10																			

Relinquished by: [signature]	Date: 2/2/12	Time: 1200	Relinquished by:
Received by:	Date:	Time:	Received at BRL by: [signature]
Shipping carrier: FED EX	# of coolers: 1		BRL work order ID:

Date:	Time:	
Date: 2/3/12	Time: 0836	
BRL project ID:		

MEMORANDUM **CH2MHILL**

Corrections to COCs

TO: Jen Hartmann, Brooks Rand Labs

COPIES: File
Data Validation Package
Laboratory Package SDG: 403743

FROM: Hillary Ott
Project Data Manager

DATE: February 9, 2012

This memo is to document corrections made to entries on the Chains of Custody (COC) and Logins for Vieques, SWMU 6, Tissue.

The corrections include changes to the sample IDs on the COC and Login:

Sample ID on Login	Corrected Sample ID	Date Collected	SDG
VWW06-FS02-0112	VWW06-FS02-0212	2/1/2012	403743
VWW06-FS03-0112	VWW06-FS03-0212	2/1/2012	403743
VWW06-FS03-0112-MS	VWW06-FS03-0212-MS	2/1/2012	403743
VWW06-FS03-0112-SD	VWW06-FS03-0212-SD	2/1/2012	403743
VWW06-FS05-0112	VWW06-FS05-0212	2/1/2012	403743
VWW06-FS05P-0112	VWW06-FS05P-0212	2/1/2012	403743
VWW06-FS08-0112	VWW06-FS08-0212	2/1/2012	403743
VWW06-CRB05-0112	VWW06-CRB05-0212	2/1/2012	403743
VWW06-CRB05P-0112	VWW06-CRB05P-0212	2/1/2012	403743

The corrections include changes to the sample collection times:

Sample ID	Incorrect Date Collected	Correct Date Collected
VWW06-FS01P-0112	2/1/2012	1/31/2012
VWW06-FS05P-0212	1/31/2012	2/1/2012
VWW06-CRB05P-0212	1/31/2012	2/1/2012

1
210

The corrections include changes to the sample analysis:

Sample ID	Date Collected	Analysis Requested	Analysis to Cancel
VWW06-FS03-0212-MS	2/1/2012	Select METALs, PCBCONG, WCHEM	WCHEM
VWW06-FS03-0212-SD	2/1/2012	Select METALs, PCBCONG, WCHEM	WCHEM
VWW06-FS07-0112-MS	1/31/2012	Select METALs, PCBCONG, WCHEM	WCHEM
VWW06-FS07-0112-SD	1/31/2012	Select METALs, PCBCONG, WCHEM	WCHEM
VWW06-CRB03-0112-MS	1/31/2012	Select METALs, PCBCONG, WCHEM	WCHEM
VWW06-CRB03-0112-SD	1/31/2012	Select METALs, PCBCONG, WCHEM	WCHEM
VWW06-CRB07-0112-MS	1/31/2012	Select METALs, PCBCONG, WCHEM	WCHEM
VWW06-CRB07-0112-SD	1/31/2012	Select METALs, PCBCONG, WCHEM	WCHEM

LABORATORY NARRATIVES

Sample Summary

TestAmerica West Sacramento Project Number G2B080439

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
MQN74	1	VWW06-FS01-0112	1/31/2012	2/8/2012 09:00 AM
MQN75	2	VWW06-FS01P-0112	1/31/2012	2/8/2012 09:00 AM
MQN76	3	VWW06-FS02-0212	2/1/2012	2/8/2012 09:00 AM
MQN78	4	VWW06-FS03-0212	2/1/2012	2/8/2012 09:00 AM
MQN79	5	VWW06-FS04-0112	1/31/2012	2/8/2012 09:00 AM
MQN8A	6	VWW06-FS05-0212	2/1/2012	2/8/2012 09:00 AM
MQN8C	7	VWW06-FS05P-0212	2/1/2012	2/8/2012 09:00 AM
MQN8D	8	VWW06-FS06-0112	1/31/2012	2/8/2012 09:00 AM
MQN8J	9	VWW06-FS07-0112	1/31/2012	2/8/2012 09:00 AM
MQN8K	10	VWW06-FS08-0212	2/1/2012	2/8/2012 09:00 AM
MQN8L	11	VWW06-CRB01-0112	1/31/2012	2/8/2012 09:00 AM
MQN8P	12	VWW06-CRB01P-0112	1/31/2012	2/8/2012 09:00 AM
MQN8R	13	VWW06-CRB02-0112	1/31/2012	2/8/2012 09:00 AM
MQN8V	14	VWW06-CRB03-0112	1/31/2012	2/8/2012 09:00 AM
MQN8X	15	VWW06-CRB04-0112	1/31/2012	2/8/2012 09:00 AM
MQN81	16	VWW06-CRB05-0212	2/1/2012	2/8/2012 09:00 AM
MQN82	17	VWW06-CRB05P-0212	2/1/2012	2/8/2012 09:00 AM
MQN83	18	VWW06-CRB06-0112	1/31/2012	2/8/2012 09:00 AM
MQN84	19	VWW06-CRB07-0112	1/31/2012	2/8/2012 09:00 AM
MQN86	20	VWW06-CRB08-0112	1/31/2012	2/8/2012 09:00 AM
MQN9C	21	HOMOGENIZATION BLANK-FISH	2/6/2012 04:45 PM	2/8/2012 09:00 AM
MQN9J	22	HOMOGENIZATION BLANK-CRAB	2/6/2012 01:30 PM	2/8/2012 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Case Narrative

TestAmerica West Sacramento Project Number G2B080439

General Comments

Data has been reported in accordance with the DoD QSM v4.1 requirements. The U qualifier indicates the analyte was not detected and is reported as less than the limit of detection (LOD). The "U" appears next to all the results where the LOD has been substituted for "ND".

Per project requirements the samples were analyzed in accordance with method 1668A but the recovery limits from method update C were used.

Data has been evaluated down to the estimated detection limit (EDL). The EDL is expressed in the DL column

Manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: S-Q-004, including Addendum 1.

BIOLOGIC, 8290, Lipids, Percent
Samples: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20
Due to low sample volume, samples were weighed out at 10 grams vs 20 grams.

BIOLOGIC, 1668A, PCBs
Samples: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20
Due to low sample volume, sample size was reduced from 20 grams to 10 grams. Final volume is now 10uL.

Samples: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
The matrix spike/matrix spike duplicate (MS/MSD) performed on sample 4 associated with this extraction batch has recoveries outside the established control limits for several compounds. Acceptable laboratory control sample (LCS) data demonstrate that the analytical system is in control. This anomaly is matrix related.

Several analytes in the method blank and each sample have been qualified with a "Q" flag as the ion abundance ratios are outside of criteria. The analytes have been reported as an "estimated maximum possible concentration" (EMPC) because the quantitation is based on the theoretical ion abundance ratio for these analytes.

The calibration standards and samples required manual integration for several compounds. Detailed information can be found in the Manual Integration Addendum section of this report.

Case Narrative

TestAmerica West Sacramento Project Number G2B080439

BIOLOGIC, 1668A, PCBs (continued)
Samples: 11, 12, 13, 14, 15, 16, 17, 18, 19, 20
Several analytes in the method blank and each sample have been qualified with a "Q" flag as the ion abundance ratios are outside of criteria. The analytes have been reported as an "estimated maximum possible concentration" (EMPC) because the quantitation is based on the theoretical ion abundance ratio for these analytes.

Samples: 1, 2, 3, 4, 5
The noted samples were diluted due to high analyte concentrations and to bring any over-range results into the calibration range of the instrument.. Reporting limits were adjusted accordingly. Sample 4 and the associated MS/MSD were analyzed at a 50X dilution due to the high analyte recoveries and matrix interferences affecting the IS recoveries.

Samples: 14, 15
The noted samples were diluted prior to analysis, due to high analyte concentrations. Reporting limits were adjusted accordingly.

Sample: 3
This sample exhibited elevated noise or matrix interferences for PCB-126 requiring the detection limits to be raised appropriately. The analyte was flagged with the "G" qualifier.

Sample: 4
The recovery standards listed below have ion abundance ratios outside of acceptance criteria. The theoretical areas for the recovery standards were used to quantitate the related internal standards recoveries. There is no impact on the data quality as a result of this anomaly.

Sample	RS
4	13C-PCB-9, 13C-PCB-194
4 MS	13C-PCB-194

The concentration of PCB-118 in the noted sample and the associated MS exceeded the upper quantitation level of the initial calibration curve, but the peaks did not saturate the instrument detector. Historical data indicates that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported with the 'E" qualifier. The client was notified and advised the laboratory to proceed with a complex dilution of the sarnple. Both sets of data have been included in this report.

Case Narrative

TestAmerica West Sacramento Project Number G2B080439

BIOLOGIC, 1668A, PCBs (continued)
Sample: 4
The required dilution factor was higher than could be achieved by "in vial" dilution. It would dilute out the internal standards. The 100X dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent and re-spiking the extract with internal standard . It should be noted that the re-spiking with internal standard negates the isotope dilution compensation for analyte loss during the sample extraction.

The internal standards listed below have ion abundance ratios outside of acceptance criteria. The theoretical areas for the internal standards were used to quantitate the recoveries and to quantitate related target analytes. There is no impact on the data quality as a result of this anomaly.

Sample	IS
4	13C-PCB-3
4 MSD	13C-PCB-3, 13C-PCB-209

Sample: 8
Several internal standard recoveries in the noted sample are above the method recommended goal due to matrix interferences in this sample. This sample has been reported at a 1X and at a 5X dilution. The 5X analysis minimized the matrix interferences so as to bring the internal standards into compliance with the method recommended limits.

The recoveries for PCB 105 and PCB 118 are outside the established control limits for the matrix spike (MS) associated with this batch. The concentrations of the analytes in the parent sample are greater than 4 times the added spike concentration. Acceptable LCS data demonstrate that the analytical system is in control.

WATER, 1668A, PCBs
Samples: 21, 22
The internal standard 13C12-PCB 15 has an ion abundance ratio outside of acceptance criteria. The theoretical area for the internal standard was used to quantitate the recovery and to quantitate the related target analyte, PCB 15. The recovery of PCB 15 in the LCS was within acceptance limits. The LCS was re-analyzed and the same result was obtained. There is no remaining sample volume available to re-extract the associated samples. The client was notified and authorized the laboratory to report this data.

Case Narrative

TestAmerica West Sacramento Project Number G2B080439

WATER, 1668A, PCBs (continued)
Samples: 21, 22
Several analytes in each sample and the associated method blank have been qualified with a "Q" flag as the ion abundance ratios are outside of criteria. The analytes have been reported as an "estimated maximum possible concentration" (EMPC) because the quantitation is based on the theoretical ion abundance ratio for these analytes.

The internal standards 13C12-PCB 104 and 13C12-PCB 155 have recoveries lower than the method recommended goal. Generally, data quality is not considered affected if the internal standard signal-to-noise ratio is greater than 10:1, which is achieved for all internal standards in the LCS. The LCS was re-analyzed and the same results were obtained. There is no remaining sample volume available to re-extract the associated samples. The client was notified and authorized the laboratory to report this data.

There were no other anomalies associated with this project

Sample Summary

TestAmerica West Sacramento Project Number G2B080439

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
MQN74	1	VWW06-FS01-0112	1/31/2012	2/8/2012 09:00 AM
MQN75	2	VWW06-FS01P-0112	1/31/2012	2/8/2012 09:00 AM
MQN76	3	VWW06-FS02-0212	2/1/2012	2/8/2012 09:00 AM
MQN78	4	VWW06-FS03-0212	2/1/2012	2/8/2012 09:00 AM
MQN79	5	VWW06-FS04-0112	1/31/2012	2/8/2012 09:00 AM
MQN8A	6	VWW06-FS05-0212	2/1/2012	2/8/2012 09:00 AM
MQN8C	7	VWW06-FS05P-0212	2/1/2012	2/8/2012 09:00 AM
MQN8D	8	VWW06-FS06-0112	1/31/2012	2/8/2012 09:00 AM
MQN8J	9	VWW06-FS07-0112	1/31/2012	2/8/2012 09:00 AM
MQN8K	10	VWW06-FS08-0212	2/1/2012	2/8/2012 09:00 AM
MQN8L	11	VWW06-CRB01-0112	1/31/2012	2/8/2012 09:00 AM
MQN8P	12	VWW06-CRB01P-0112	1/31/2012	2/8/2012 09:00 AM
MQN8R	13	VWW06-CRB02-0112	1/31/2012	2/8/2012 09:00 AM
MQN8V	14	VWW06-CRB03-0112	1/31/2012	2/8/2012 09:00 AM
MQN8X	15	VWW06-CRB04-0112	1/31/2012	2/8/2012 09:00 AM
MQN81	16	VWW06-CRB05-0212	2/1/2012	2/8/2012 09:00 AM
MQN82	17	VWW06-CRB05P-0212	2/1/2012	2/8/2012 09:00 AM
MQN83	18	VWW06-CRB06-0112	1/31/2012	2/8/2012 09:00 AM
MQN84	19	VWW06-CRB07-0112	1/31/2012	2/8/2012 09:00 AM
MQN86	20	VWW06-CRB08-0112	1/31/2012	2/8/2012 09:00 AM
MQN9C	21	HOMOGENIZATION BLANK-FISH	2/6/2012 04:45 PM	2/8/2012 09:00 AM
MQN9J	22	HOMOGENIZATION BLANK-CRAB	2/6/2012 01:30 PM	2/8/2012 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, visoosity, and weight.

Case Narrative

Shipping and Receiving

On February 3, 2012, Brooks Rand Labs (BRL) received ten (10) fish and ten (10) crab samples at 08:30 A.M. in a cooler with dry ice and at -5.3 °C. The samples were logged in for the contracted analyses of lead (Pb), thallium (Tl), zinc (Zn), and percent total solids (%TS). The sample was received and stored securely according to BRL standard operating procedures (SOP) and EPA methodology.

Preservation and Holding Time

All method and SOP requirements for preservation and holding time were satisfied.

Homogenization (SOP BR-0106)

Once thawed, the samples were homogenized using pre-cleaned commercial grade homogenization equipment. The internal organs of the fish were removed prior to whole body homogenization. The crab samples were homogenized whole body. During homogenization of the biota samples, two homogenization blanks were collected and batched for analysis.

Trace Metals EPA Method 1638 modified (BR-0070)

Analysis is performed by EPA Draft Method 1638 (modified) using inductively coupled plasma - mass spectrometry (ICP-MS). Prior to analysis, 0.5 mg aliquots of the samples are digested with 10 mL ultra-pure nitric acid and 100 µL hydrogen peroxide and heating for a minimum of four hours at 100 °C. Aliquots of digested sample are analyzed utilizing internal standardization. This method incorporates ionization of the sample in an inductively-coupled RF plasma, with detection of the resulting ions by mass spectrometer on the basis of their mass-to-charge ratio.

The Department of Defense (DoD) acceptance criteria for the dilution tests state that the diluted result must be ±10% of the native result. Therefore, when the native sample produces a result of 1 (unit independent), the acceptable range for the dilution duplicate is 0.9 - 1.1 units. However, in the upper limit the relative percent difference (RPD) between the two values is 9.5% whereas in the lower limit the RPD is 10.5%. BRL has set the RPD limit to 10% in the report as this is the closest approximation the LIMS is capable of representing.

Results greater than the MDL and less than or equal to the MRL are reported as the LOD and qualified **U**.

The interference check standard known generally as ICS-A was labeled "IFA". The interference check standard generally known as ICS-AB was labeled "IFB". The information for the interference check standards can be found in the Instrument Calibration pages of the respective analyte and sequence. In cases where the interference check solution has no certified value, the report indicates that the true value is "0.0001 µg/L." In actuality, the true value is 0, but due to a limitation of the LIMS a non-zero value has to be assigned.

Sample results were reported on an as-received basis in mg/kg (wet weight).

When the sample result and/or the associated method duplicate result were non-detectable values the RPD was not calculated (N/C).

Sequence 1200096

The Pb and Tl interference check solutions produce acceptable recoveries. The Zn IFA and IFB results call for a careful evaluation. The IFA was not spiked for Zn and therefore produced a result less than the LOD. Rather than convert the units of µg/g to units of µg/L for LOD evaluation, BRL judged the LOD criteria for continuing calibration blank (CCB) standards and IFAs against water reporting limits. The table below gives the reporting limits for the freshwater matrix for all DoD analytes in this batch.

Analyte	MDL	LOD	MRL	Units
Pb	0.005	0.01	0.025	ug/L
Tl	0.003	0.006	0.01	ug/L
Zn	0.06	0.12	0.2	ug/L

For Zn analysis, the secondary calibration verification standard (-SCV1) did not meet the acceptance criteria. The DoD QSM does not require SCV analysis however, and all other quality control samples [independent calibration verification (ICV) and IFB] meet the acceptance criteria and no further corrective action was required.

Batch B120198

Matrix matching certified reference materials (CRM) can be difficult for biota matrices. The most similar reference materials available to BRL (which were prepared with this batch) were dogfish liver (DOLT-4) and lobster hepatopancreas (TORT-2). While both materials are organs of aquatic marine life, neither consists of whole-body homogenizations; both CRMs were limited to the homogenization of a single organ. Additionally, neither of these CRMs was certified for Tl.

During the final data review, BRL's Quality Assurance department observed unusual recoveries of the CRMs. These CRMs have historically produced excellent recoveries. See the chart below:

SRM	Analyte	Average Recovery	σ
DOLT-4 Dogfish Liver	Pb	93%	23%
	Zn	108%	11%
TORT-2 Lobster Hepatopancreas	Pb	106%	17%
	Zn	94%	23%

Note: n=30 for all statistics

The discrepancy was clearly an error that occurred during sample preparation, sample analysis, or data recording. When the LIMS IDs for the two CRMs were reversed from what was listed on the preparation sheet, both CRMs produce results consistent with historical data and certified values. Due to the time constraints of this data package due date, re-analysis to confirm was not possible. Instead the raw data produced at the instrument was compared to the certified values of the reference material for over 10 analytes. BRL judged the CRMs were inadvertently switched.

While the preparation bench sheet indicates -CRM1 is DOLT-4 and –CRM2 is TORT-2, the data was uploaded such that –CRM1 is TORT-2 and –CRM2 is DOLT-4. Update instrument printouts with the certified values can be found on page 531 of this report.

The Pb analysis of CRM DOLT-4 recovered at 144%, but was certified less than 5x MRL (5x PQL). Since the measured result of DOLT-4 was less than 5x MRL and within 2x the certified value, BRL's secondary acceptance criteria was met; no corrective action was warranted.

The dilution tests were labeled as B120198-DUP5 through B120198-DUP8 (analyzed at a 50x dilution).

The Pb analysis of -DUP1 and -DUP2, performed on samples *VWW06-FS03-0212* (1205028-04) and *VWW06-FS06-0112* (1205028-09), produced RPDs not meeting the acceptance criteria. Similarly the Zn analysis of -DUP2, performed on sample *VWW06-FS06-0112* (1205028-09), did not meet duplicate precision requirements. The cause was likely due to the sample matrix which were whole-body fish homogenizations. All analytical duplicates (-DUP5 through -DUP8) passed the dilution test indicating the duplicate disparity was due to homogenization as opposed to matrix interferences. The native sample results associated with -DUP1 and -DUP2 (for Pb) and –DUP2 (for Zn) were qualified **M** accordingly. Other samples may be affected. However, since all other method duplicates met acceptance criteria, no additional qualifiers were applied.

The Pb analysis of –DUP8 produced an RPD of 11%; however, the native sample result was not greater than 50x MRL. In addition, a post-digestion spike (PS) was performed on the sample and recovered within acceptance criteria. No further corrective action was required.

The matrix spike/matrix spike duplicate sets (-MS1/-MSD1 and –MS3/-MSD3) performed on samples *VWW06-FS03-0212* (1205028-04) and *VWW06-SRB03-0112* (1205028-14) were spiked with Pb concentrations less than the native sample results. The recoveries were therefore not considered valid indicators of data quality. Post preparation spikes were analyzed at an appropriate spiking level and yielded excellent recoveries.

The MS/MSD sets –MS2/-MSD2 and –MS4/-MSD4 were spiked with Zn concentrations approximately equal to the native sample results. The recoveries were deemed to be attributed to precision (homogeneity) issues as opposed to accuracy or interference issues. To strengthen this assertion, if the DUP results were substituted in place of the native sample results then the spike recoveries would be acceptable for both MS/MSD sets. Neither MS/MSD sets were adequately spiked above the native sample concentration and post preparation spikes were analyzed and recovered well within the acceptance limits.

Percent Total Solids in Solids by SM 2540G (SOP BR-1501)

A solid sample is homogenized and an aliquot is measured into a pre-weighed vessel, dried in an oven overnight, weighed again, and the percent of dried solid material is calculated.

The results may have been evaluated using reporting limits that have been adjusted to account for sample aliquot size. Please refer to the Sample Results page for sample-specific MDLs, MRLs, and other details.

Batch B120240

All data was reported without qualification and all associated quality control sample results met the acceptance criteria.

Per the client's specific request to adhere to the EPA Draft Method 1638 requirement of non-method blank corrected data, the results were not method blank corrected as described in the calculations section of the relevant BRL SOP(s). This deviates from BRL's standard protocol for trace level data quality and BRL believes that all low-level metals analyses should be method blank corrected and that not doing so may lead to less accurate results. The results from the method blanks that were analyzed are listed in the *Method Blanks & Reporting Limits* section of this report.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. BRL, an accredited laboratory, certifies that the reported results of all analyses for which BRL is NELAP accredited meet all NELAP requirements. For more details, please see the *Report Information* page in your report. Please feel free to contact us if you have any questions regarding this report.

Lydia Greaves
Project Manager
lydia@brooksrand.com

Tiffany Stilwater
Project Manager
tiffany@brooksrand.com

REGION II

VALIDATION

WORKSHEETS

PACKAGE COMPLETENESS AND DELIVERABLES

CASE/SDGNUMBER: G2B080439 SITE: Vieques - Sumu6
LAB: TestAmerica - Sacramento

CHECKLIST

1.0 **Data Completeness and Deliverables**

1.1 Does the Traffic Report or Field Chain of Custody list all samples? [✓] ___ ___

1.2 Is the Case Narrative, extraction logs, % solid worksheet, analysis logs present? [✓] ___ ___

1.3 Are the Case Number and SDG numbers contained in the case narrative? [✓] ___ ___

1.4 Do the Traffic Reports or Lab Case Narrative indicate problems with sample receipt, sample condition, analytical problems, or other comments affecting the quality of the data? ___ [✓] ___

ACTION: Use professional judgement to evaluate the effect of the noted problems on the quality of the data.

These samples are tissue samples. And 2 homoginization blanks

ACTION: **As per Field Chain of Custody/Region II requirements, if any sample analyzed as a soil, contains 50% to 90% water, all data shall be flagged as estimated "J". If a soil sample contains more than 90% water, then qualify positive hits "J", and non detects "R".**

NOTE: Samplers are required to maintain all types of environmental samples in the dark at < 4 ° C from the time of collection until receipt at the laboratory.

2.0 **Reporting Requirements and Deliverables**

2.1 All deliverables must be clearly labeled with the Case number and the associated sample/traffic number. Missing or illegible or incorrectly labeled items must be identified. The Project Officer must immediately be contacted and requested to ask laboratory to submit the missing or incorrect items.

2.2 The following forms were taken from the CLP SOW, CBC01.0 and should be specified in the Project Plan. A comparison of CLP forms must be made against the Laboratory's version. Some information may not be found on the exact form as the CLP version but may be located on another form. As long as the information is present and accessible, it is not a problem. Are these forms (CLP or lab's version) present?

* NOT CLP - FORMS NOT SAME - ALL INFO REQ IS PRESENT

a. Toxic CB Congener Sample Data Summary (Form I CB-1) [✓] ___ ___

b. Toxic CB Congener Toxicity Equivalency (Form I CB-2) [✓] ___ ___

c. CB Congener Sample Data Summary (Form I CB-3) [✓] ___ ___

Note: Form I is used for tabulating and reporting sample analysis, including dilutions, reanalysis, blank, LCS/Ongoing Precision and Recovery (OPR) and requested matrix spike and matrix spike duplicated for target compounds.

d. CB Congener Total Homologue Concentration Summary (Form II CB) [✓] ___ ___

Note: Form II is used to report the concentration of the mono- through nano-chloro

biphenyl homologue for each sample.

e. CB Congener Method Blank Summary (Form IV CB-1) see Extraction logs [✓] ___ ___

Note: Form IV summarizes the samples associated with each method blank analysis.

f. CB Congener Descriptor Switching Resolution Summary (Form V CB-1) [✓] ___ ___

Note: Form V CB-1 is used to report the descriptor switching windows for each level of chlorination for each 12-hour time period and to summarize the date and time of analysis, including dilutions, reanalysis, standards. blanks, and requested MS/MSD associated with each analysis of the instrument performance check solution. not on a form mainly present on run logs & CCV pgs.

g. CB Congener Ion Abundance Ratio Summary (Form V CB-2) [✓] ___ ___
h. CB Congener (Labeled) Ion Abundance Ion Ratio Summary (Form V CB-3) [✓] ___ ___

Note: Form V CB-2 & CB-3 are used to report the ion abundance ratios and signal-to-noise (S/N) ratios for the congeners contained in the LOC/WDM for each 12-hour time period.

i. Toxic CB Congener Initial Calibration Response Factor Summary (Form VI CB-1, CB-2) [✓] ___ ___

j. Individual Congener Initial Calibration Response Factor Summary (Form VI CB-3) [✓] ___ ___

Note: Form VI is used to report the relative response factors (RRF), average RRF, % RSD and RRT for the five or six-point initial calibration at the specific concentration levels.

k. Toxic CB Congener Continuing Calibration Summary (Form VII CB-1) [✓] ___ ___

l. Toxic CB Congener (Labeled) Continuing Calibration Summary (Form VII CB-2) [✓] ___ ___

m. Individual Congener Continuing Calibration Summary (Form VII CB-3) [✓] ___ ___

n. Toxic CB Congener Continuing Calibration Time Summary (Form VII CB-4) [✓] ___ ___

o. Toxic CB Congener (Labeled) Continuing Calibration Summary (Form VII CB-5) [✓] ___ ___

p. Individual Congener Continuing Calibration Summary (Form VII CB-6) [✓] ___ ___

Note: Form VII is used to report the calibration verification of the HRGC/HRMS system by the analysis of specific calibration verification standard(s). The form is required for each 12-hour time period.

k. CB Congener Analytical Sequence (Form VIII CB) [✓] ___ ___
Note: Form VIII is used to report the analytical sequence for CB congener analyses.

ACTION: If forms are missing, contact the Project Officer to confirm which forms if any were specified in the Project Plan. If the forms are required, inform the Project Officer or obtain written permission to contact the lab for explanation/resubmittal. If the lab cannot provide missing deliverables, assess the effect on the validity of the data. Note in the Data Assessment.

Note: The above forms might be different or the laboratory might combine several forms into a single one. For example, the Target Analyte, Concentration and Q (qualifier) columns in the "CB Congener Sample Data Summary" form might include columns for IUPAC NO., Co-elution, Reporting Limits, Ion Abundance Ratio and Relative Retention Time (RRT).

2.3 GC/MS Displays
Are the following GC/MS displays present?

a. Standard and sample SICP/SIM chromatograms must list date and time of analysis; the file name; sample number; and instrument I.D. number [✓] ___ ___

b. Percent peak resolution valley [✓] ___ ___

c. Window Defining Mixture raw data [✓] ___ ___

d. SICP/SIM mass chromatograms must display ions used for quantitation, ion abundance ratio, absolute retention time/scan number, signal noise ratio * [✓] ___ ___

e. Integrated area of the two ions must be listed for all peaks with signal noise ratio of 2.5 or greater (>10 for calibration and internal standards). [ ] ___ ___

S/N ratios not provided ✓

* see statement from lab

ACTION: If deliverables are missing, contact the Project Officer to request explanation/ resubmittal or obtain written permission to contact the lab for explanation/resubmittal. If the lab cannot provide missing deliverables, assess the effect on the validity of the data. Note in the Data Assessment.

2.4 Are the following Chain of Custody Records and in-house Laboratory Control Documents present?

a. Chain of Custody Records/Traffic Report [✓] ___ ___

b. Sample Shipment Records [✓] ___ ___

c. Sample log-in sheets [✓] ___ ___

d. GC/MS Standard and Sample Run Log in chronological order [✓] ___ ___

e. Sample Extraction Log [✓] ___ ___

ACTION: If deliverables are missing, contact the Project Officer to request explanation/resubmittals or obtain written permission to contact the lab for explanation/resubmittal. If the lab cannot provide missing deliverables, assess the effect on the validity of the data. Note in the Data Assessment.

2.5 Was the sample data package paginated and one sided? [ ] ✓ ___

ACTION: If no, document difficulties of reviewing data caused by lack of pagination in Data Assessment Report.

dbl sided but was paginated

3.0 Holding Times

3.1 There are no demonstrated maximum holding times associated with CBs in aqueous, solid, semi-solid, tissues and other matrices. Aqueous samples must be preserved (pH 2-3) and stored up to one year in the dark at 0-4° C. Solid, semi-solids, multi-phase, and tissue samples must be stored in the dark at <-10° C.

4.0 Instrument Performance

S = 1/31, 2/1 r = 2/8
p - 2/14-2/16 a - 2/17, 2/21-2/24, 3/6

4.1 Mass Spectrometer (MS) Resolution

Perfluorokerosene (PFK) tuning must be performed prior to analyzing calibration solutions, blanks, samples, and QC samples. A static resolving power of at least 10,000 (10% valley definition) must be demonstrated at appropriate masses before any analysis is performed. Static resolving power checks must be performed at the beginning and at the end of each 12 hour period of operation. A minimum required resolving power of 10000

should be obtained for PFK ion at mass 330.9792 or any significant PFK fragment in the range of 300-350.

A manual estimate of the resolving power can be done using the resolution check printout/calibration reports that contain the peak profiles of masses 300 to 350. At mass 330.9792, the first horizontal guideline above the baseline is the 5% line (some MS data system might not show this line). The ppm measurement of the window is usually given at 200 ppm, thus every vertical guideline represents 50 ppm. If the PFK peak is within 100 ppm at 5% height, resolution is equal or greater than 10.000.

NOTE: Because of the extensive mass range covered in each function (native, group and labeled congeners) it may not be possible to maintain 10,000 resolution throughout the mass range during the function. Therefore, resolution must be ≥ 8,000 throughout the mass range and must be ≥ 10,000 in the center of the mass range for each function.

4.1.1 Estimating resolving power (RP) from the resolution check printout containing the peak profiles of masses 300-350

PFK print outs were provided criteria were met

A. Search the data package for the mass 330.9792 PFK peak ion (usually present before the calibration raw data).
A. Locate the 5% line which is the first horizontal gridline above the baseline.
C. At the top left hand corner of the profile, the ppm measurement of the window can be found (usually 200 ppm). Each vertical gridline represents 50 ppm.
D. If the PFK peak is within 100 ppm at 5% height, the resolution is greater than 10,000.

4.2 Gas Chromatographic (GC) Column Resolution

For the SPB-octyl column, the retention times (RT) for decachlororbiphenyl (PCB 209) in the Labeled/LOC/Window Defining Standard must be greater than 55 minutes and uniquely resolve congeners 34 from 23 and 187 from 182. Congeners 156 and 157 must co-elute within 2 seconds at the peak maximum. ✓

4.2.1 The uniquely resolved congeners must resolve with a valley height less than 40% of the shortest of the two peaks.

Was this criterion met? [✓] ___ ___

Note: The criteria for chromatographic resolution must be met for all standards. The data validator should use professional judgment to determine severity of the problem and its effect on the final results.

ACTION: If the percent valley criteria are not met for the uniquely resolved congeners, qualify positive reported values "J" (estimate) or reject "R" all data collected during the 12-hour time window. Document in Data Assessment Report under contract non-compliance.

4.2.2 Were all peaks labeled and identified on the Selected Ion Current Profiles (SICPs)? [✓] ___ ___

4.2.3 Is the absolute retention time of CB congener 209 greater than 55.0 minutes with the SPB-octyl capillary GC column? [✓] ___ ___

ACTION: If no, use professional judgment to assess the effect on the validity of the data. Make a note in the Data Assessment Report under contract non-compliance..

4.2.4 The relative retention times (RRT) of the native CBs and labeled congeners in the calibration verification standard (VER CS-3) must be within their respective RRT limits listed in Table 2/Method 1668A/CB01.0.

Was this criterion met? [✓]* ___ ___

* per Statement from lab RRTs were not provided

ACTION: If no, use professional judgment to assess the effect on the validity of the data. Make a note in the Data Assessment Report under contract non-compliance.

4.3 Window Defining Mixture

4.3.1 The Window Defining Mixture (WDM) standard contains 27 labeled congeners (Table 3/Method 1668A) and is analyzed to establish the beginning retention time (RT) and ending RTs of each level of chlorination (LOC, homologue group).

Note: The WDM are also used to set the descriptor switching time such that congeners that elute from the HRGC during a given RT window will also be those congeners for which the ions are monitored.

Did the laboratory label the WDM congeners in each sample Quant report? [ ] ✓ __ __

ACTION: If no, contract project officer or the laboratory for missing data. These are not explicitly labeled but the set-up of the quant page makes them clear.

4.3.2 Frequency of Window Defining Mixture - must be analyzed as follows:

1. After HRMS PFK tune and before any initial calibration. - CS3

2. Once at the beginning of each 12-hour period during which standards or samples are analyzed. CS3

3. Whenever adjustments or instrument maintenance activities are performed.

Note: The standard CS1 can be used before any initial calibration and CS3 can be used before any continuing calibration.

ACTION: Were the above criteria met? [✓] __ __

4.3.3 The CB congeners must be within QC limits for their respective ion abundance ratio and must have signal-to-noise (S/N) ratios ≥ 10.

Was this criteria met? ion-abundance ratios were met but S/N ratios were not provided * [✓] __ __

If no, did the lab perform reanalysis? Use professional judgment to assess the effect on the validity of the data. Make a note in the Data Assessment Report under contract non-compliance.

* See statement from lab

5.0 Initial Calibration

The Isotope dilution technique is used in the calibration of Toxics/LOC CB Congeners using labeled reference compounds. An Internal Standard calibration is applied to the determination of the native CB Congeners for which a labeled is not available, to the determination of the labeled Toxics/LOC/Window Defining Congeners and Labeled Internal Standards except CB 178.

Was the above calibration performed at the frequency specified above? [✓] __ __

5.1 The method allows the Laboratory to perform quantitative analysis by isotope dilution and internal standard.

1. Isotope Dilution: performed for the twenty seven (27) CB Congeners. The relative response (RR) (labeled to native) vs concentration is calculated and the response of each Toxics/LOC CB relative to its labeled analog is determined using the area response of both primary and secondary exact m/z ratios. For labeled compounds, a calibration is performed using the data from five (or six) points in the calibration for the native Toxics/LOC CB Congeners.

2. Calibration by Internal Standard: for the native congeners (other than the native Toxics/LOC

CB Congeners), calibration is performed at a single point using the diluted combined 209-Congener Standard solution.

5.1.1 The following MS/DS conditions must be used:

5.1.1.1 Mass calibration as per Section 4.1? [✓] ___ ___

5.1.1.2 Were SIM data acquired for each of the ions listed in Table 7/Method 1668A including interfering ions? [✓] ___ ___

5.2 Were the following criteria met?

5.2.1 The SPB-Octyl column must resolve CB-34 from CB-23, CB-187 from CB-182, and CB-156 and CB-157 must coelute within 2 seconds at the peak maximum. Resolution must have a valley height less than 40 percent of the shorter of the two peaks. [✓] ___ ___

5.2.2 For analysis on a DB-1 (or equivalent) column the chromatographic resolution is evaluated by the analysis of the CS3 continuing calibration standard during both the initial and continuing calibrations. Resolution must have a valley less than 25% for CB-156 and CB-157. [ ] ___ [✓]

5.2.3 The relative ion abundance criteria listed in Table 8 (see analytical method) must be met for all PCB congeners peaks, including the labeled internal standards, clean-up standards, and recovery standards in all solutions. The lower and upper limits of the ion abundance ratios represent a ±15 percent window around the theoretical abundance ratio for each pair of selected ions. [ ] [✓] ___ ___

5.2.4 Are the two SIM ions for each homolog within 2 seconds of the corresponding labeled analyte ions? [✓] ___ ___

5.2.5 The relative ion abundance criteria listed in **Table 8** (see analytical method) must be met for each PCB congener peak. [✓] [✓] ___ X1 corr JAC 4/3/12

5.2.6 For all calibration solutions the signal to noise ratio (S/N) for the GC signal present in every SICP, including the ones for the labeled standards must be ≥ 10. * [✓] ___ ___

* S/N ratios were not provided - See lab statement

5.2.7 The percent relative standard deviations (% RSD) for the mean relative response factors (RRF) must be ≤ 20%. [✓] ___ ___

5.2.8 The relative response factor (RRF) for each congener standard must be greater than 0.05. [✓] ___ ___

5.2.9 For all calibration solutions, the retention times (RT) of the congeners must fall with the appropriate RT window established by the window defining mix analysis. In addition, the absolute RT of the of the recovery standards, internal standards and clean-up standards will not change by more than ± 15 seconds between the initial CS3 and the analysis of any other standard. [✓] ___ ___

ACTION:

1. If mass calibration criteria as specified in Section 4.1 were not met, make a note in Data Assessment.

2. If the selected monitoring ions specified in **Table 7/Method 1668A** were not used for data acquisition, the lab must be contacted by the Project Officer for an explanation. If an incorrect ion was used, reject "R" all the associated data.

3. If the 40% percent valley resolution for CBs listed in section 5.2.1 above were not met, quality

positive data "J". Do not qualify non-detects.

4. If the ion abundance ratio for an analyte is outside the limits, flag the results for that analyte "R" (reject).

5. If the ion abundance ratio for an internal or labeled standard falls outside the QC limits flag the associated positive hits with "J". No effect on the non-detects.

6. If the signal to noise ratio (S/N) is below control limits, use professional judgement to determine quality of the data.

7. If the %RSD for each analyte exceeds 20%, flag the associated sample positive results for that specific analyte as estimated ("J"). No effect on the non-detect data. all OK

8. If the DB-1 column was used, did the resolution have a valley of less than 25% for CB-156 and CB-157? If not met, qualify the analytes as estimate ("J"). Do not qualify non-detects.

9. If the RRF < 0.05, flag associate sample positive results for that specific congener as estimate "J".

10. Non compliance of any other criteria specified above should be evaluated using professional judgement.

5.2.10 Spot check response factor calculations and ion ratios. Ensure that the correct quantitation ions for the unlabeled CBs and labeled standards were used. In addition, verify that the appropriate labeled standard was used for each analyte.

ACTION: If calculations were not performed correctly, notify the Project Officer to initiate resubmittals from the laboratory.

6.0 System and Laboratory Performance (Calibration Verification)

At the beginning of a 12-hour shift during which analyses are performed, the HR/MS system performance tune is verified prior to analyzing the calibration verification standard CS3. If required, the diluted combined 209-congener standard solutions must also be analyzed at the beginning of the 12-hour period, but after the CS3. The CS3 standard must analyzed at the end of the 12-hour. This closing CS3 standard may also be used as the beginning of the next 12-hour period.

Only if the laboratory meets all performance criteria may samples, blanks, and recovery standards be analyzed.

6.1 Calibration Verification

6.1.1 Were the relative ion abundance ratio for each congener in the CS3 standard within their respective criteria? Some MI required. Hard copy present. ☐ ✓ __ __

6.1.2 Were the peaks representing each unlabeled and labeled compound in the verification standard present with signal to noise ratio (S/N) greater or equal to 10? * Per lab statement - NO S/N ratios provided ☐ * ✓ __ __

6.1.3 For each congener, were the per cent recovery within the limit (Table 6/method 1668A)? (Native Toxics/LOC: 70-130%; Labeled Toxics/LOC/Window-Defining; 50-150% and 60-130% for the cleanup standards) only some not listed in Table 6 were slightly about +/- 30% criteria. NO * ☐ ✓ __ __ XI corr JAC 4B12

6.1.4 Were the relative retention time (RRT) of the congeners within the limits defined in Table 2/Method 1668A? Note: RRT should be listed in each sample quant report. * Per lab statement - no RRT provided ☐ ✓ __ __

lab reported %D's relative to mean RRF rather than conc & %R.

ACTION: If no to section 6.1.1 - 6.1.4, qualify affected congener with "J" qualifier.

6.2 Instrument Sensitivity Test

6.2.1 Project technical specifications may require the laboratory to perform a GC/MS sensitivity test using the CS-0.2 standard. The following guidance is offered:

6.2.2 The test must be demonstrated every 12 hours by analysis of a CS-0.2 standard which must pass the following criteria

No ICAL or CCAL Quals were required.

6.2.2.1 The absolute RT for the ending recovery standards $^{13}C_{12}$-CL_4-CB-52, $^{13}C_{12}$-CL_5-CB-101, $^{13}C_{12}$-Cl-CB-138, and $^{13}C_{12}$-CL_7-CB-178 must be within 10 seconds of the initial CS3.

6.2.2.2 The signal/noise ratio for the CS-0.2 standard must be at least 10:1 (or 3:1 for di- and nona-PCBs for unlabeled compounds and labeled internal and recovery standards.

6.2.2.3 Ion abundance ratio must be met.

ACTION:

1. If the ion abundance ratio for an analyte is outside the limits, flag the results for that analyte "R" (reject).

2. If the signal noise ratio (S/N) is below control limits, use professional judgement to determine the quality of the data.

3. The RT of the recovery standards from CS3 to the CS-0.2 will indicate the stability of the column during the 12 hours. If these criteria were not met, the estimate all reported values (J) and (UJ) non-detects associated with RT shifts greater than ± 10 seconds.

6.3 Spot check response factor calculations and ion ratios. Ensure that the correct quantitation ions for the unlabeled CBs and labeled standards were used. In addition, verify the appropriate labeled standard was used for each analyte.

7.0 Sample Analysis and Identification

NOTE: Any qualifications such as "J" applied to target compounds should be also applied to their associated total congeners concentration column. ✓

7.1 A CB congener or labeled compound is identified in environment samples, blanks, or QC samples when all of the following qualitative criteria are met.

7.1.1 The signals for the two exact m/z ratios in **Table 7/Method 1668A** must be present and must maximize within the same two scans (area count for the m/z should be present in the Quant report) [✓] ___ ___

7.1.2 The signal-to-noise (S/N) ratio for each ion peak at each exact m/z must be ≥2.5 for each congener detected in a sample extract and ≥10 for all congener in the calibration standards (Note: The SN ratio should be available in each sample Quant report) [✓] ___ ___

7.1.3 The relative ion abundance criteria for all CB Congener detected as well as labeled compounds, cleanup and internal standards must be within the limits of Table 8 or within ±15% of the ratio in the midpoint calibration (CS-3) standard or calibration verification (VER), whichever is most recent. [✓] ___ ___

7.1.4 The relative retention time (RRT) for each detected peak must be within the RRT QC limits specified in Table 2 of the method (Note: The RRT values should be present in each sample Quant report). [✓]* ___ ___

*RRT's not provided. See statement from lab.

Note: For native congeners determined by Internal Standard Quantitation, a given congener may fall within more than one RT and mis-identified unless the RRT window are made very narrow, as in Table 2. Therefore, consistency of the RT and RRT with other congeners and the labeled compounds may be required for rigorous congener identification. The RT and RRT values should be available in each sample Quant report.

ACTION: If the identification criteria (section 7.1.1 - 7.1.4) were not met, check sample Quant report to verify the congener is listed as "non-detect".

7.2 Quantitative Determination

7.2.1 Isotope Dilution Quantitation

7.2.1.1 Were the Labeled Toxics/Level of Chlorination (LOC)/Window-Defining Congeners (WDC) and Cleanup standards added to every sample? [✓] ___ ___

ACTION: If no, contact project officer to contact the laboratory. Note problem in data assessment.

Note: Corrections for recovery of CB can be made because the native compound and its Labeled analog exhibit similar effects upon extraction, concentration and Gas Chromatography. Relative response (RR) are used in conjunction with the calibration data to determine the concentrations in the final extract providing the labeled compounds spiking levels are constant.

7.2.1.2 The percent recovery for the Labeled Toxics/LOC/Window Defining Congeners for each sample is 25-150%, except 15-150% for $^{13}C_{12}$ -2- MoCB and $^{13}C_{12}$ -4- MoCB. 30 -135% for Cleanup Standards. Was this criteria met? * sample -08 Rerun at dilution exclude original [ ] ___ ___ [✓]

ACTION: If no, qualify affected native congener with "J". Make a note in the data assessment.

7.2.1.3 The integrated ion current for the labeled compounds, internal standards, and cleanup standards have a signal noise ratio at least 10 times background noise. * [✓] ___ ___

ACTION: If not, verify that the sample in question was reanalyzed. If s/n ratio is less than 10, qualify affected native congener with "J".

7.2.1.4 Did the laboratory provide a "sample calculation" for one of the reported value? * per statement from lab - S/N ratios not provided [✓] ___ ___

ACTION: Check one value and if not in agreement with the reported value, have Project Officer contact laboratory for a sample calculation.

See lab calculation pages included in these worksheets

$$C_{ex}\ (ng/ml) = \frac{(A1_n + A2_n)CI}{(A1_l + A2_l)RR} \qquad RR = \frac{(A1_n + A2_n)C_l}{(A1_l + A2_l)C_n}$$

C_{ex} = Concentration of congener in the extract.
$A1_n$ and $A2_n$ = The areas of the primary and secondary m/z's for the congener.
C_l = Concentration of the labeled compound in the calibration standard.
C_n =Concentration of the native compound in the calibration standard.
RR = Relative Response

7.2.2 Internal Standard Quantitation and Labeled Compound Recovery

7.2.2.1 The concentration in the extract of the native compounds other than those in the Native Toxics/Labeled /LOC standard, in the Labeled cleanup standard and in the Labeled injection internal standard (except the Labeled CB 178) using the response factors determined from the calibration data and the following equations:

$$C_{ex}\ (ng/ml) = \frac{(A1_s + A2_s)C_{is}}{(A1_{is} + A2_{is})RF} \qquad RF = \frac{(A1_s + A2_s)C_{is}}{(A1_{is} + A2_{is})C_s}$$

C_{ex} = Concentration of labeled compound in the extract.
$A1_s$ and $A2_s$ = Areas of the primary and secondary m/z's for the congener.
$A1_{is}$ and $A2_{is}$ = Areas of the primary and secondary m/z's for the internal standard
C_{is} = Concentration of the internal standard.
C_s = Concentration of the compound in the calibration standard.
RF = Response Factor

Note: The internal standard and associated CB congeners can be found in Table 2 of the method.

7.2.2.2 The percent recovery of the Labeled Toxics/LOC/Window-defining CBs and the Labeled cleanup standard CBs are computed using the concentration in the extract determined above and the following equation:

$$Recovery\ (\%) = \frac{\text{Concentration found (ng/ml)}}{\text{Concentration spiked (ng/ml)}} \times 100$$

7.2.2.3 The concentration of the native CB in the solid phase is computed using the following equation:

$$\text{Concentration in the solid (ng/kg)} = \frac{(C_{ex} \times V_{ex})}{W_s}$$

C_{ex} = Concentration of the compound in the extract.
V_{ex} = The extract volume in ml.
W_s = The sample dry weight in kg.

7.2.2.4 The concentration of the native CB in the aqueous phase is computed using the following equation:

$$\text{Concentration in the aqueous phase (pg/L)} = 1000 \times \frac{(C_{ex} \times V_{ex})}{V_s}$$

C_{ex} = Concentration of the compound in the extract.
V_{ex} = The extract volume in ml.
V_s = The sample volume in liters.

7.2.2.5 The analyte concentration must be within the calibration range. If not, dilution should have been made to bring the concentration within the calibration range. Was this criterion met? [___] ✓ ___ ___

NOTE: When the sample extract is diluted by the factor necessary to bring the concentration within the calibration range, the analyst should adjust the concentration of the Labeled injection internal standard to 100 pg/uL in the extract and analyze an aliquot of the diluted extract.

Flag - E
flagged result in sample 4 as estimated J

7.3 Clean-up procedures

Clean-up may not be necessary for relatively clean samples (drinking waters, ground waters etc). If the matrix required clean-up, the laboratory has 6 different procedures to choose from (Section 7.5/Method 1668A). Before using any clean-up procedure, the laboratory must demonstrate that the Initial Precision and Recovery (IPR) requirements of the

method can be met using the clean-up procedure.

Labeled clean-up standards $^{13}C_{12}$-2,4,4-TriCB (CB-28), $^{13}C_{12}$-2,3 3,5,5'-PeCB (CB-111), $^{13}C_{12}$-2,2',3,3'5,5',6-HPCB (CB-178) are added to the sample just before the back extraction with base and acid procedure. This occurs before any recommended clean-up procedures are initiated.

7.3.1 Was the percent recovery of the clean-up standards within the recommended range 30-135%? [✓] ___ ___

ACTION: If no, and the recovery is less than 30%, qualify all data as estimated "J". If recovery is 0 %, qualify all positive data as estimated "J" and reject "R" all non-detects for that sample.
If recovery is > 135, qualify positive results as estimated, "J".

7.3.2 Check the chromatograms that clean-up procedure was needed for each sample. Were any clean-up procedures needed for either water or soil samples? ___ [✓] ___

ACTION: If yes, check extraction log to verify which clean-up procedures if any were performed. The laboratory is not limited to only one procedure.

1. If no clean-up was performed and the chromatograms indicated that some should have been performed. Use professional judgement to assess the effect on the interference on the validity of the data. Document lack of required clean-up for complex samples in Data Assessment.

2. If one type of clean-up was performed, but the chromatograms indicate that additional clean-up should have been utilized. Use professional judgement to assess the effect on the interference on the validity of the data. Document lack of additional clean-up for complex samples in the Data Assessment.

7.3.3 If clean-up procedures were used, did the Laboratory perform clean-up procedures on the Initial Precision and Recovery samples as required by the method? [ ] ___ ___ ✓

ACTION: If no, use professional judgement to assess the effect of the interference on the validity of the data. Document lack of IPR documentation for clean-up procedures in the Data Assessment.

8.0 Estimated Detection Limits (EMDL)

8.1 Was an EDL calculated using the formula in section 8.2 for CB congeners reported as non-detect? [✓*] ___ ___

ACTION: 1. If EDL of an analyte which was not reported as a positive hit is missing, correct manually or contact the Project Officer to request from the laboratory corrections.

*Calculated per lab method SOP

8.2 Use the equation below to check EDL calculations:

ALL MATRICES OTHER THAN WATER

$$EDL\ (pg/g) = \frac{2.5 \times Qis \times (Hx^1 + Hx^2) \times D}{(W) \times (His^1 + His^2) \times RR}$$

WATER

$$EDL\ (pg/L) = \frac{2.5 \times Qis \times (Hx^1 + Hx^2) \times D}{(V) \times (His^1 + His^2) \times RR}$$

Where:

Hx^1 and Hx^2 = peak heights of the noise for both quantitation ions of the non-detect isomer of interest.

His^1 and His^2 = peak heights of both the quantitation ions of the appropriate internal standards.

D = dilution factor

Qis = quantity (ng) of the appropriate internal standard added to the sample prior to extraction.

RR = Relative response factor from the initial calibration.

V = Volume of sample extracted in liters.

W = Sample dry weight.

NOTE: The validator should check the EDL data to verify that peak heights and not areas were used for this calculation. If the area algorithm was used, the validator should contact the Project Officer to request recalculations from the laboratory.

ACTION: If the spot check calculations yielded EDLs ≤ 15% difference from those reported in Form I, correct manually. If the difference between the validator's value and the Form I's values are > 15% contact the Project Officer to request from the laboratory for an explanation and a copy of the laboratory's calculations.

9.0 Method Blanks

9.1 Has a method blank per matrix been extracted and analyzed with each batch of 20 samples? [✓] ___ ___

9.2 If samples of some matrix were analyzed in different events (i.e. different shifts or days) has one blank for each matrix been extracted and analyzed for each event? [✓] ___ ___

9.3 Were the method blanks treated as a sample, i.e. spiked with Labeled Toxics/LOC/Window Defining Mixture, Labeled Internal and Labeled Cleanup standards? [✓] ___ ___

Note: 1 Liter of reagent water is used for aqueous samples, 10 gram sand for soil/sediment samples and 1.0 gram of corn oil for tissue samples.

9.4 Were any CB present in the method blank at a concentration less than the estimate minimum level (EML) of Table 2/Method 1668A or one-third the regulatory compliance limits? [ ] ___ ✓

Note: The EML in Table 2 of the method are based on common contamination levels. A laboratory may establish an minimum level (ML) for a CB lower than the EMLs in Table 2. MLs may be established as low as the lowest calibration point. Check project plan regarding compliance limits.

ACTION: 1. If the proper number of method blanks were not analyzed, document in Data Assessment. If the validator feels that the validity of the data is seriously compromised and validation of data without the method blanks would be flawed, then notify the Project Officer. If decision is made to proceed with the validation process, consider the following actions: no action taken on non-detected analytes. If an analyte has a reported concentration that is > 5 times the EML, qualify "J" and all concentrations ≤ 5 times the EML are qualified "R" due to possibility of contamination.

2. A. If the congener concentration in the sample is less than five times the concentration in the blank, flag the congener reported value with a "U" qualifier.

* For Blank Cont < LOD - Flag U @ LOD & otherwise < LOD otherwise no flag

* For blank Cont > LOD: flagging U if blk result is < LOD & J if between LOD & 10X blk

Homogenization Blank-Crab in pg/L. Divide by 1X106 to convert to pg/g

No Action

Sample_Name	Result_Type	Lab_Sample_ID	Dilution	Chem_Name	Analyte_Value	Result_Units	Lab_Qualifier
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	3,3'-Dichlorobiphenyl (11)	40	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',4-Trichlorobiphenyl (17)	4.0	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (28/20)	49	PG_L	C J B
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3,4'-Trichlorobiphenyl (22)	6.8	PG_L	J Q B
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,4',5-Trichlorobiphenyl (31)	28	PG_L	J B
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,4',6-Trichlorobiphenyl (32)	8.2	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (44/47/65)	61	PG_L	C J B
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (69/49)	45	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',5,5'-Tetrachlorobiphenyl (52)	150	PG_L	J B
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3,3',4'-Tetrachlorobiphenyl (56)	22	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3,4,4'-Tetrachlorobiphenyl (60)	15	PG_L	J Q
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (61/70/74/76)	200	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3,4',6-Tetrachlorobiphenyl (64)	28	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3',4,4'-Tetrachlorobiphenyl (66)	120	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,3',6-Pentachlorobiphenyl (84)	7.5	PG_L	J Q
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (117/116/85)	42	PG_L	C J Q
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (86/87/97/108/119/125)	88	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (88/91)	17	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (113/90/101)	330	PG_L	C J B
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,5,5'-Pentachlorobiphenyl (92)	29	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,5',6-Pentachlorobiphenyl (95)	48	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',4,4',5-Pentachlorobiphenyl (99)	220	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3,3',4,4'-Pentachlorobiphenyl (105)	140	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3,3',4,6-Pentachlorobiphenyl (109)	34	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (110/115)	310	PG_L	C J B
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3,4,4',5-Pentachlorobiphenyl (114)	7.6	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3',4,4',5-Pentachlorobiphenyl (118)	470	PG_L	B
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (128/166)	34	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (138/163/129)	310	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	7.7	PG_L	J Q
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,3',4,6-Hexachlorobiphenyl (131)	9.8	PG_L	U
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	9.1	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	9.8	PG_L	U
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (151/135)	14	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	14	PG_L	J Q
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	46	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (147/149)	87	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (153/168)	270	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (156/157)	52	PG_L	C
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3,3',4,4',6-Hexachlorobiphenyl (158)	34	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	17	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	18	PG_L	J Q
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	12	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Congeners (180/193)	48	PG_L	C J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	9.3	PG_L	J Q
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	34	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	7.1	PG_L	J
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Monochlorobiphenyls	0	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Dichlorobiphenyls	40	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Trichlorobiphenyls	130	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Tetrachlorobiphenyls	660	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Pentachlorobiphenyls	1800	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Hexachlorobiphenyls	910	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Heptachlorobiphenyls	130	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Octachlorobiphenyls	20	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Total Nonachlorobiphenyls	0	PG_L	
HOMOGENIZATION BLANK-CRAB	DL1	G2B080439022	0.98	Toxic Equivalents (Total TEQ)	0.0206	PG_L	

Homogenization Blank- fish (-021) pg/L Hits

AL pg/g ÷ 1000000 No Action

Sample_Name	Lab_QC_Type	Lab_Sample_ID	Dilution	Chem_Name	Analyte_ID	Original_Analyte_Value	Result_Units	Lab_Qualifier
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2-Chlorobiphenyl (1)	2051-60-7	3.0	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',4-Trichlorobiphenyl (17)	37680-66-3	8.0	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (28/20)	28&20	50	PG_L	C J B
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (21/33)	21&33	14	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	11	PG_L	J Q B
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,4',5-Trichlorobiphenyl (31)	16606-02-3	38	PG_L	J B
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,4',6-Trichlorobiphenyl (32)	38444-77-8	11	PG_L	J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (40/71)	40&71	23	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	15	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (44/47/65)	44&47&65	150	PG_L	C J B
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (69/49)	69&49	140	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (50/53)	50&53	16	PG_L	C J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	430	PG_L	B
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	32	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	19	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (61/70/74/76)	61&70&74&76	320	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	49	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	140	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	4.6	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	9.8	PG_L	J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	16	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	83	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (117/116/85)	117&116&85	75	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (86/87/97/108/119/125)	86&87&97&108&	360	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (88/91)	88&91	70	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (113/90/101)	113&90&101	860	PG_L	C B
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	150	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	430	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	350	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	5.3	PG_L	J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	150	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	41	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (107/124)	107&124	60	PG_L	U C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (110/115)	110&115	730	PG_L	C B
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	9.0	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	540	PG_L	B
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (128/166)	128&166	81	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (138/163/129)	138&163&129	510	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	28	PG_L	J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	110	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	8.4	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (134/143)	134&143	14	PG_L	C J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (151/135)	151&135	110	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	43	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	19	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	77	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	16	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	60	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (147/149)	147&149	290	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (153/168)	153&168	390	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (156/157)	156&157	72	PG_L	C
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	62	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	31	PG_L	J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	28	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	47	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (171/173)	171&173	13	PG_L	C J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	5.7	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	29	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	23	PG_L	J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	11	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (180/193)	180&193	73	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	17	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	38	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	6.2	PG_L	J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	8.3	PG_L	J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Congeners (198/199)	198&199	13	PG_L	C J
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	4.7	PG_L	J Q
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Monochlorobiphenyls	TOTALMONOCB	3.0	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Dichlorobiphenyls	TOTALDICB	0	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Trichlorobiphenyls	TOTALTRICB	160	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Tetrachlorobiphenyls	TOTALTETRACB	1400	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Pentachlorobiphenyls	TOTALPENTACB	3900	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Hexachlorobiphenyls	TOTALHEXACB	2000	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Heptachlorobiphenyls	TOTALHEPTACB	280	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Octachlorobiphenyls	TOTALOCTACB	32	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Total Nonachlorobiphenyls	TOTALNONACB	6.5	PG_L	
HOMOGENIZATION BLANK-FISH	BLK	G2B080439021	1	Toxic Equivalents (Total TEQ)	TOTALTEQ	0.0244	PG_L	

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B140000 - 127B	Work Order #....:	MQT541AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

See validation notes for tables & action

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.0 U		0.62	20	pg/g
PCB-2	2.0 U		0.54	20	pg/g
PCB-3	1.0 U		0.44	20	pg/g
PCB-4	10 U		2.0	20	pg/g
PCB-5	10 U		2.5	20	pg/g
PCB-6	10 U		2.5	20	pg/g
PCB-7	10 U		2.4	20	pg/g
PCB-8	10 U		2.5	20	pg/g
PCB-9	10 U		2.7	20	pg/g
PCB-10	10 U		1.2	20	pg/g
PCB-11	10 U	J	2.6	20	pg/g
PCB-12/13	20 U		2.6	40	pg/g
PCB-14	10 U		2.2	20	pg/g
PCB-15	10 U		2.1	20	pg/g
PCB-16	1.0 U		0.53	20	pg/g
PCB-17	1.0 U		0.43	20	pg/g
PCB-18/30	1.4	C J Q	0.36	40	pg/g
PCB-19	1.0 U		0.59	20	pg/g
PCB-20/28	2.9	C J	0.62	40	pg/g
PCB-21/33	2.0 U	C J Q	0.59 NA	40	pg/g
PCB-22	1.0 U		0.65	20	pg/g
PCB-23	1.0 U		0.60	20	pg/g
PCB-24	1.0 U		0.33	20	pg/g
PCB-25	1.0 U		0.62	20	pg/g
PCB-26/29	2.0 U		0.60	40	pg/g
PCB-27	1.0 U		0.32	20	pg/g
PCB-31	2.8	J Q	0.58	20	pg/g
PCB-32	0.61	J Q	0.31	20	pg/g
PCB-34	1.0 U		0.62	20	pg/g
PCB-35	2.0 U		0.65	20	pg/g
PCB-36	1.0 U		0.57	20	pg/g
PCB-37	1.0 U	J Q	0.54	20	pg/g
PCB-38	1.0 U		0.65	20	pg/g
PCB-39	1.0 U		0.58	20	pg/g
PCB-40/71	2.0 U		0.45	40	pg/g
PCB-41	1.0 U		0.63	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B140000 - 127B	Work Order #....:	MQT541AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-42	1.0 U	0.50	20	pg/g
PCB-43	1.0 U	0.56	20	pg/g
PCB-45	1.0 U	0.57	20	pg/g
PCB-46	1.0 U	0.56	20	pg/g
PCB-44/47/65	9.6 C J	0.45	60	pg/g
PCB-48	1.0 U	0.48	20	pg/g
PCB-49/69	0.92 C J Q	0.39	40	pg/g
PCB-50/53	2.0 U	0.46	40	pg/g
PCB-51	1.0 U	0.43	20	pg/g
PCB-52	3.3 J	0.49	20	pg/g
PCB-54	1.0 U	0.27	20	pg/g
PCB-55	2.0 U	0.54	20	pg/g
PCB-56	1.0 U	0.55	20	pg/g
PCB-57	1.0 U	0.52	20	pg/g
PCB-58	1.0 U	0.51	20	pg/g
PCB-59/62/75	3.0 U	0.35	60	pg/g
PCB-60	2.0 U	0.54	20	pg/g
PCB-61/70/74/76	3.7 C J	0.50	80	pg/g
PCB-63	1.0 U	0.47	20	pg/g
PCB-64	1.0 U	0.33	20	pg/g
PCB-66	1.0 U	0.53	20	pg/g
PCB-67	1.0 U	0.49	20	pg/g
PCB-68	2.0 U	0.48	20	pg/g
PCB-72	1.0 U	0.50	20	pg/g
PCB-73	1.0 U	0.36	20	pg/g
PCB-77	1.0 U	0.45	2.0	pg/g
PCB-78	1.0 U	0.56	20	pg/g
PCB-79	1.0 U	0.48	20	pg/g
PCB-80	1.0 U	0.46	20	pg/g
PCB-81	1.0 U	0.47	2.0	pg/g
PCB-82	1.0 U	0.63	20	pg/g
PCB-83	1.0 U	0.51	20	pg/g
PCB-84	1.0 U	0.60	20	pg/g
PCB-85/116/117	3.0 U	0.42	60	pg/g
PCB-86/87/97/108/119/125	6.0 U	0.46	120	pg/g
PCB-88/91	2.0 U	0.51	40	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B140000 - 127B	Work Order #....:	MQT541AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	1.0 U		0.57	20	pg/g
PCB-90/101/113	2.7	C J	0.46	60	pg/g
PCB-92	1.0 U		0.54	20	pg/g
PCB-93/100	2.0 U		0.50	40	pg/g
PCB-94	1.0 U		0.55	20	pg/g
PCB-95	3.1	J	0.52	20	pg/g
PCB-96	1.0 U		0.22	20	pg/g
PCB-98/102	2.0 U		0.53	40	pg/g
PCB-99	2.0 U		0.46	20	pg/g
PCB-103	1.0 U		0.48	20	pg/g
PCB-104	1.0 U		0.33	20	pg/g
PCB-105	1.0 U	J Q	0.36	2.0	pg/g
PCB-106	2.0 U		0.49	20	pg/g
PCB-109	2.0 U		0.32	20	pg/g
PCB-107/124	6.0 U		0.40	40	pg/g
PCB-110/115	2.9	C J	0.42	40	pg/g
PCB-111	1.0 U		0.38	20	pg/g
PCB-112	1.0 U		0.50	20	pg/g
PCB-114	1.0 U		0.36	2.0	pg/g
PCB-118	1.2	J Q	0.36	2.0	pg/g
PCB-120	1.0 U		0.38	20	pg/g
PCB-121	1.0 U		0.38	20	pg/g
PCB-122	1.0 U		0.40	20	pg/g
PCB-123	1.0 U		0.35	2.0	pg/g
PCB-126	1.0 U		0.37	2.0	pg/g
PCB-127	1.0 U		0.40	20	pg/g
PCB-128/166	2.0 U		0.22	40	pg/g
PCB-129/138/163	3.0 U		0.22	60	pg/g
PCB-130	1.0 U		0.29	20	pg/g
PCB-131	1.0 U		0.28	20	pg/g
PCB-132	1.0 U		0.27	20	pg/g
PCB-133	1.0 U		0.27	20	pg/g
PCB-134/143	2.0 U		0.30	40	pg/g
PCB-135/151	2.0 U		0.25	40	pg/g
PCB-136	1.0 U		0.19	20	pg/g
PCB-137	1.0 U		0.20	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B140000 - 127B	Work Order #....:	MQT541AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-139/140	2.0 U	0.24	40	pg/g
PCB-141	1.0 U	0.31	20	pg/g
PCB-142	1.0 U	0.32	20	pg/g
PCB-144	1.0 U	0.25	20	pg/g
PCB-145	1.0 U	0.19	20	pg/g
PCB-146	1.0 U	0.20	20	pg/g
PCB-147/149	2.0 U	0.24	40	pg/g
PCB-148	1.0 U	0.24	20	pg/g
PCB-150	1.0 U	0.18	20	pg/g
PCB-152	1.0 U	0.18	20	pg/g
PCB-153/168	2.0 U	0.19	40	pg/g
PCB-154	1.0 U	0.23	20	pg/g
PCB-155	1.0 U	0.26	20	pg/g
PCB-156/157	2.0 U	0.26	4.0	pg/g
PCB-158	1.0 U	0.19	20	pg/g
PCB-159	1.0 U	0.25	20	pg/g
PCB-160	1.0 U	0.24	20	pg/g
PCB-161	1.0 U	0.24	20	pg/g
PCB-162	1.0 U	0.25	20	pg/g
PCB-164	1.0 U	0.25	20	pg/g
PCB-165	1.0 U	0.21	20	pg/g
PCB-167	1.0 U	0.20	2.0	pg/g
PCB-169	1.0 U	0.25	2.0	pg/g
PCB-170	2.0 U	0.43	20	pg/g
PCB-171/173	2.0 U	0.44	40	pg/g
PCB-172	1.0 U	0.41	20	pg/g
PCB-174	1.0 U	0.50	20	pg/g
PCB-175	1.0 U	0.23	20	pg/g
PCB-176	1.0 U	0.17	20	pg/g
PCB-177	1.0 U	0.43	20	pg/g
PCB-178	1.0 U	0.23	20	pg/g
PCB-179	1.0 U	0.18	20	pg/g
PCB-180/193	2.0 U	0.35	40	pg/g
PCB-181	2.0 U	0.35	20	pg/g
PCB-182	1.0 U	0.23	20	pg/g
PCB-183	2.0 U	0.26	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B140000 - 127B	Work Order #....:	MQT541AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	1.0 U		0.18	20	pg/g
PCB-185	2.0 U		0.45	20	pg/g
PCB-186	1.0 U		0.17	20	pg/g
PCB-187	1.0 U		0.20	20	pg/g
PCB-188	1.0 U		0.27	20	pg/g
PCB-189	1.0 U	J	0.23	2.0	pg/g
PCB-190	1.0 U		0.29	20	pg/g
PCB-191	1.0 U		0.31	20	pg/g
PCB-192	1.0 U		0.33	20	pg/g
PCB-194	1.0 U		0.33	20	pg/g
PCB-195	1.0 U		0.34	20	pg/g
PCB-196	1.0 U		0.23	20	pg/g
PCB-197	1.0 U		0.15	20	pg/g
PCB-198/199	2.0 U		0.26	40	pg/g
PCB-200	2.0 U		0.24	20	pg/g
PCB-201	1.0 U		0.18	20	pg/g
PCB-202	1.0 U		0.22	20	pg/g
PCB-203	1.0 U		0.25	20	pg/g
PCB-204	1.0 U		0.18	20	pg/g
PCB-205	1.0 U		0.21	20	pg/g
PCB-206	1.0 U		0.32	20	pg/g
PCB-207	1.0 U		0.18	20	pg/g
PCB-208	1.0 U		0.16	20	pg/g
PCB-209	2.0 U		0.25	20	pg/g
Total MoCB	ND	U	0.44	20	pg/g
Total DiCB	ND	U	2.1	20	pg/g
Total TrCB	9.6		0.54	20	pg/g
Total TeCB	18		0.45	20	pg/g
Total PeCB	10		0.37	20	pg/g
Total HxCB	ND	U	0.25	20	pg/g
Total HpCB	0.27		0.23	20	pg/g
Total OcCB	ND	U	0.21	20	pg/g
Total NoCB	ND	U	0.32	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B140000 - 127B	**Work Order #....:**	MQT541AA	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
PCB-1L	40	5.0 - 145
PCB-3L	36	5.0 - 145
PCB-4L	29	5.0 - 145
PCB-19L	36	5.0 - 145
PCB-37L	83	5.0 - 145
PCB-54L	35	5.0 - 145
PCB-77L	88	10 - 145
PCB-81L	86	10 - 145
PCB-104L	40	10 - 145
PCB-105L	82	10 - 145
PCB-114L	80	10 - 145
PCB-118L	74	10 - 145
PCB-123L	83	10 - 145
PCB-126L	89	10 - 145
PCB-155L	67	10 - 145
PCB-156L/157L	135	10 - 145
PCB-167L	129	10 - 145
PCB-169L	127	10 - 145
PCB-188L	48	10 - 145
PCB-189L	106	10 - 145
PCB-202L	67	10 - 145
PCB-205L	78	10 - 145
PCB-206L	61	10 - 145
PCB-208L	79	10 - 145
PCB-209L	51	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	73	5.0 - 145
PCB-178L	66	10 - 145
PCB-111L	79	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit

C Co-eluting isomer

J Estimated Result

Q Estimated maximum possible concentration (EMPC).

Prep Batch 2Ø46Ø94

• all %R of internals & recoveries were OK

RB150000-094B

PCB-118 3.9 J pg/g

Total Tr 14 pg/g ?

Te 14

Pe 14

no action - homogenization

blks - only associated samples

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B150000 - 094B	Work Order #....:	MQVQP1AA	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1000 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	10 U		1.2	200	pg/L
PCB-2	10 U		0.89	200	pg/L
PCB-3	10 U		1.6	200	pg/L
PCB-4	25 U		5.3	200	pg/L
PCB-5	10 U		6.0	200	pg/L
PCB-6	25 U		6.2	200	pg/L
PCB-7	25 U		5.8	200	pg/L
PCB-8	30 U		6.1	200	pg/L
PCB-9	25 U		6.6	200	pg/L
PCB-10	25 U		3.8	200	pg/L
PCB-11	25 U		31	200	pg/L
PCB-12/13	20 U		6.3	400	pg/L
PCB-14	25 U		5.3	200	pg/L
PCB-15	10 U		5.8	200	pg/L
PCB-16	25 U		1.7	200	pg/L
PCB-17	10 U		1.4	200	pg/L
PCB-18/30	60 U	C J	1.2	400	pg/L
PCB-19	10 U		1.4	200	pg/L
PCB-20/28	20 U	C J	1.3	400	pg/L
PCB-21/33	20 U		1.3	400	pg/L
PCB-22	10 U	J Q	1.4	200	pg/L
PCB-23	10 U		1.3	200	pg/L
PCB-24	10 U		1.1	200	pg/L
PCB-25	10 U		1.3	200	pg/L
PCB-26/29	20 U		1.3	400	pg/L
PCB-27	10 U		1.0	200	pg/L
PCB-31	10 U	J	1.2	200	pg/L
PCB-32	10 U		1.0	200	pg/L
PCB-34	10 U		1.3	200	pg/L
PCB-35	10 U		1.4	200	pg/L
PCB-36	10 U		1.2	200	pg/L
PCB-37	10 U		1.4	200	pg/L
PCB-38	10 U		1.4	200	pg/L
PCB-39	10 U		1.2	200	pg/L
PCB-40/71	30 U		2.0	400	pg/L
PCB-41	30 U		2.8	200	pg/L

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B150000 - 094B	Work Order #....:	MQVQP1AA	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1000 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	10 U		2.2	200	pg/L
PCB-43	10 U		2.5	200	pg/L
PCB-45	20 U		2.5	200	pg/L
PCB-46	10 U		2.5	200	pg/L
PCB-44/47/65	30 U	C J Q	2.0	600	pg/L
PCB-48	10 U		2.1	200	pg/L
PCB-49/69	20 U		1.7	400	pg/L
PCB-50/53	20 U		2.0	400	pg/L
PCB-51	20 U		1.9	200	pg/L
PCB-52	10 U	J	2.2	200	pg/L
PCB-54	10 U		1.1	200	pg/L
PCB-55	10 U		2.5	200	pg/L
PCB-56	10 U		2.5	200	pg/L
PCB-57	10 U		2.4	200	pg/L
PCB-58	10 U		2.4	200	pg/L
PCB-59/62/75	30 U		1.6	600	pg/L
PCB-60	10 U		2.5	200	pg/L
PCB-61/70/74/76	40 U		2.3	800	pg/L
PCB-63	10 U		2.1	200	pg/L
PCB-64	10 U		1.5	200	pg/L
PCB-66	10 U		2.4	200	pg/L
PCB-67	10 U		2.3	200	pg/L
PCB-68	10 U		2.2	200	pg/L
PCB-72	10 U		2.3	200	pg/L
PCB-73	10 U		1.6	200	pg/L
PCB-77	10 U		2.5	20	pg/L
PCB-78	10 U		2.6	200	pg/L
PCB-79	10 U		2.2	200	pg/L
PCB-80	10 U		2.1	200	pg/L
PCB-81	10 U		2.6	20	pg/L
PCB-82	10 U		3.5	200	pg/L
PCB-83	20 U		2.8	200	pg/L
PCB-84	10 U		3.3	200	pg/L
PCB-85/116/117	40 U		2.3	600	pg/L
PCB-86/87/97/108/119/125	60 U		2.5	1200	pg/L
PCB-88/91	20 U		2.8	400	pg/L

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B150000 - 094B	Work Order #....:	MQVQP1AA	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1000 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	10 U		3.1	200	pg/L
PCB-90/101/113	30 U	C J	2.5	600	pg/L
PCB-92	10 U		3.0	200	pg/L
PCB-93/100	40 U		2.7	400	pg/L
PCB-94	10 U		3.0	200	pg/L
PCB-95	10 U		2.8	200	pg/L
PCB-96	10 U		1.5	200	pg/L
PCB-98/102	40 U		2.9	400	pg/L
PCB-99	20 U		2.5	200	pg/L
PCB-103	10 U		2.6	200	pg/L
PCB-104	10 U		1.4	200	pg/L
PCB-105	10 U		1.9	20	pg/L
PCB-106	20 U		2.7	200	pg/L
PCB-109	10 U		1.8	200	pg/L
PCB-107/124	60 U		2.2	400	pg/L
PCB-110/115	40 U	C J Q	2.3	400	pg/L
PCB-111	10 U		2.1	200	pg/L
PCB-112	10 U		2.7	200	pg/L
PCB-114	10 U		2.3	20	pg/L
PCB-118	3.9	J	2.1	20	pg/L
PCB-120	10 U		2.1	200	pg/L
PCB-121	10 U		2.1	200	pg/L
PCB-122	10 U		2.2	200	pg/L
PCB-123	10 U		2.3	20	pg/L
PCB-126	10 U		2.1	20	pg/L
PCB-127	10 U		2.2	200	pg/L
PCB-128/166	20 U		1.5	400	pg/L
PCB-129/138/163	30 U		1.6	600	pg/L
PCB-130	10 U		2.1	200	pg/L
PCB-131	10 U		2.0	200	pg/L
PCB-132	10 U		2.0	200	pg/L
PCB-133	10 U		1.9	200	pg/L
PCB-134/143	20 U		2.1	400	pg/L
PCB-135/151	20 U		1.8	400	pg/L
PCB-136	10 U		1.4	200	pg/L
PCB-137	10 U		1.4	200	pg/L

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B150000 - 094B	Work Order #....:	MQVQP1AA	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1000 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-139/140	20 U	1.7	400	pg/L
PCB-141	10 U	2.2	200	pg/L
PCB-142	10 U	2.3	200	pg/L
PCB-144	10 U	1.8	200	pg/L
PCB-145	10 U	1.4	200	pg/L
PCB-146	10 U	1.4	200	pg/L
PCB-147/149	20 U	1.7	200	pg/L
PCB-148	10 U	1.7	200	pg/L
PCB-150	10 U	1.3	200	pg/L
PCB-152	10 U	1.3	200	pg/L
PCB-153/168	20 U	1.4	400	pg/L
PCB-154	10 U	1.7	200	pg/L
PCB-155	10 U	2.2	200	pg/L
PCB-156/157	20 U	1.5	40	pg/L
PCB-158	10 U	1.4	200	pg/L
PCB-159	10 U	1.4	200	pg/L
PCB-160	10 U	1.7	200	pg/L
PCB-161	10 U	1.7	200	pg/L
PCB-162	10 U	1.4	200	pg/L
PCB-164	10 U	1.8	200	pg/L
PCB-165	10 U	1.5	200	pg/L
PCB-167	10 U	1.3	20	pg/L
PCB-169	10 U	1.2	20	pg/L
PCB-170	10 U	2.1	200	pg/L
PCB-171/173	20 U	2.2	400	pg/L
PCB-172	10 U	2.0	200	pg/L
PCB-174	10 U	2.5	200	pg/L
PCB-175	10 U	1.4	200	pg/L
PCB-176	10 U	1.0	200	pg/L
PCB-177	10 U	2.1	200	pg/L
PCB-178	10 U	1.4	200	pg/L
PCB-179	10 U	1.1	200	pg/L
PCB-180/193	20 U	1.7	400	pg/L
PCB-181	10 U	1.7	200	pg/L
PCB-182	10 U	1.4	200	pg/L
PCB-183	10 U	1.3	200	pg/L

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B150000 - 094B	Work Order #....:	MQVQP1AA	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Instrument ID....:	12D8		
Initial Wgt/Vol :	1000 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	10 U		1.1	200	pg/L
PCB-185	10 U		2.2	200	pg/L
PCB-186	10 U		1.0	200	pg/L
PCB-187	10 U		1.2	200	pg/L
PCB-188	10 U		2.0	200	pg/L
PCB-189	10 U		0.77	20	pg/L
PCB-190	10 U		1.4	200	pg/L
PCB-191	10 U		1.5	200	pg/L
PCB-192	10 U		1.6	200	pg/L
PCB-194	10 U		1.3	200	pg/L
PCB-195	10 U		1.3	200	pg/L
PCB-196	10 U		0.95	200	pg/L
PCB-197	10 U		0.63	200	pg/L
PCB-198/199	20 U		1.1	400	pg/L
PCB-200	20 U		1.0	200	pg/L
PCB-201	10 U		0.75	200	pg/L
PCB-202	10 U		1.4	200	pg/L
PCB-203	10 U		1.1	200	pg/L
PCB-204	10 U		0.76	200	pg/L
PCB-205	10 U		0.56	200	pg/L
PCB-206	10 U		0.58	200	pg/L
PCB-207	10 U		0.50	200	pg/L
PCB-208	10 U		0.59	200	pg/L
PCB-209	10 U		0.57	200	pg/L
Total MoCB	ND	U	1.6	200	pg/L
Total DiCB	ND	U	5.8	200	pg/L
Total TrCB	14		1.4	200	pg/L
Total TeCB	14		2.5	200	pg/L
Total PeCB	12		2.0	200	pg/L
Total HxCB	ND	U	1.2	200	pg/L
Total HpCB	ND	U	0.77	200	pg/L
Total OcCB	ND	U	0.56	200	pg/L
Total NoCB	ND	U	0.58	200	pg/L

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B150000 - 094B	**Work Order #....:**	MQVQP1AA	**Matrix.....:**	WATER
Date Sampled....:	02/06/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	1
Prep Date.....:	02/15/12	**Analysis Date.....:**	02/17/12		
Prep Batch # ....:	2046094	**Instrument ID.....:**	12D8		
Initial Wgt/Vol :	1000 mL	**Analyst ID.....:**	Lisa L. Hernandez		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-1L	59		5.0 - 145
PCB-3L	64		5.0 - 145
PCB-4L	47		5.0 - 145
PCB-19L	53		5.0 - 145
PCB-37L	72		5.0 - 145
PCB-54L	45		5.0 - 145
PCB-77L	69		10 - 145
PCB-81L	65		10 - 145
PCB-104L	38		10 - 145
PCB-105L	62		10 - 145
PCB-114L	54		10 - 145
PCB-118L	58		10 - 145
PCB-123L	55		10 - 145
PCB-126L	68		10 - 145
PCB-155L	32		10 - 145
PCB-156L/157L	82	C	10 - 145
PCB-167L	72		10 - 145
PCB-169L	88		10 - 145
PCB-188L	30		10 - 145
PCB-189L	87		10 - 145
PCB-202L	39		10 - 145
PCB-205L	87		10 - 145
PCB-206L	84		10 - 145
PCB-208L	63		10 - 145
PCB-209L	78		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	101	5.0 - 145
PCB-178L	80	10 - 145
PCB-111L	85	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.
C Co-eluting isomer.
J Estimated Result.
Q Estimated maximum possible concentration (EMPC).

See val notes for tables & action

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B160000 - 107B	Work Order #....:	MQWKC1AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/16/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-1	2.0 U		0.51	20	pg/g
PCB-2	2.0 U		0.47	20	pg/g
PCB-3	1.0 U		0.43	20	pg/g
PCB-4	10 U		2.0	20	pg/g
PCB-5	10 U		2.5	20	pg/g
PCB-6	10 U		2.5	20	pg/g
PCB-7	10 U		2.4	20	pg/g
PCB-8	10 U		2.5	20	pg/g
PCB-9	10 U		2.7	20	pg/g
PCB-10	10 U		1.4	20	pg/g
PCB-11	10 U		2.6	20	pg/g
PCB-12/13	20 U		2.6	20	pg/g
PCB-14	10 U		2.2	20	pg/g
PCB-15	10 U		2.4	20	pg/g
PCB-16	1.0 U		0.53	20	pg/g
PCB-17	1.1	J	0.43	20	pg/g
PCB-18/30	2.2	C J Q	0.37	20	pg/g
PCB-19	1.0 U		0.51	20	pg/g
PCB-20/28	4.8	C J	0.66	20	pg/g
PCB-21/33	2.0 U	C J	0.63	20	pg/g
PCB-22	1.7	J Q	0.69	20	pg/g
PCB-23	1.0 U		0.63	20	pg/g
PCB-24	1.0 U		0.33	20	pg/g
PCB-25	1.0 U		0.65	20	pg/g
PCB-26/29	2.0 U		0.64	20	pg/g
PCB-27	1.0 U		0.32	20	pg/g
PCB-31	4.8	J	0.62	20	pg/g
PCB-32	1.0 U		0.31	20	pg/g
PCB-34	1.0 U		0.65	20	pg/g
PCB-35	2.0 U		0.69	20	pg/g
PCB-36	1.0 U		0.60	20	pg/g
PCB-37	1.0 U		0.62	20	pg/g
PCB-38	1.0 U		0.68	20	pg/g
PCB-39	1.0 U		0.62	20	pg/g
PCB-40/71	2.0 U		0.42	20	pg/g
PCB-41	1.0 U		0.59	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B160000 - 107B	Work Order #....:	MQWKC1AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/16/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-42	1.0 U		0.47	20	pg/g
PCB-43	1.0 U		0.52	20	pg/g
PCB-45	1.0 U		0.54	20	pg/g
PCB-46	1.0 U		0.53	20	pg/g
PCB-44/47/65	12	C J	0.42	20	pg/g
PCB-48	1.0 U		0.45	20	pg/g
PCB-49/69	2.0 U		0.37	20	pg/g
PCB-50/53	0.85	C J Q	0.43	20	pg/g
PCB-51	1.0 U		0.41	20	pg/g
PCB-52	4.5	J Q	0.46	20	pg/g
PCB-54	1.0 U		0.28	20	pg/g
PCB-55	2.0 U		0.48	20	pg/g
PCB-56	1.0 U		0.49	20	pg/g
PCB-57	1.0 U		0.46	20	pg/g
PCB-58	1.0 U		0.45	20	pg/g
PCB-59/62/75	3.0 U		0.33	20	pg/g
PCB-60	2.0 U		0.48	20	pg/g
PCB-61/70/74/76	4.5	C J	0.45	20	pg/g
PCB-63	1.0 U		0.41	20	pg/g
PCB-64	1.5	J	0.31	20	pg/g
PCB-66	1.5	J Q	0.47	20	pg/g
PCB-67	1.0 U		0.44	20	pg/g
PCB-68	2.0 U		0.42	20	pg/g
PCB-72	1.0 U		0.44	20	pg/g
PCB-73	1.0 U		0.34	20	pg/g
PCB-77	1.0 U		0.44	2.0	pg/g
PCB-78	1.0 U		0.50	20	pg/g
PCB-79	1.0 U		0.43	20	pg/g
PCB-80	1.0 U		0.41	20	pg/g
PCB-81	1.0 U		0.42	2.0	pg/g
PCB-82	1.0 U		0.84	20	pg/g
PCB-83	1.0 U		0.68	20	pg/g
PCB-84	1.0 U		0.79	20	pg/g
PCB-85/116/117	3.0 U		0.56	20	pg/g
PCB-86/87/97/108/119/125	6.0 U		0.61	20	pg/g
PCB-88/91	2.0 U		0.68	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B160000 - 107B	Work Order #....:	MQWKC1AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/16/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-89	1.0 U		0.75	20	pg/g
PCB-90/101/113	2.3	C J Q	0.61	20	pg/g
PCB-92	1.0 U		0.72	20	pg/g
PCB-93/100	2.0 U		0.66	20	pg/g
PCB-94	1.0 U		0.73	20	pg/g
PCB-95	1.6	J Q	0.68	20	pg/g
PCB-96	1.0 U		0.28	20	pg/g
PCB-98/102	2.0 U		0.70	20	pg/g
PCB-99	2.0 U		0.61	20	pg/g
PCB-103	1.0 U		0.63	20	pg/g
PCB-104	1.0 U		0.34	20	pg/g
PCB-105	1.0 U	J Q	0.49	2.0	pg/g
PCB-106	2.0 U		0.65	20	pg/g
PCB-109	2.0 U		0.43	20	pg/g
PCB-107/124	6.0 U		0.53	20	pg/g
PCB-110/115	1.5	C J Q	0.56	20	pg/g
PCB-111	1.0 U		0.51	20	pg/g
PCB-112	1.0 U		0.66	20	pg/g
PCB-114	1.0 U		0.51	2.0	pg/g
PCB-118	1.2	J Q	0.46	2.0	pg/g
PCB-120	1.0 U		0.51	20	pg/g
PCB-121	1.0 U		0.51	20	pg/g
PCB-122	1.0 U		0.53	20	pg/g
PCB-123	1.0 U		0.51	2.0	pg/g
PCB-126	1.0 U		0.58	2.0	pg/g
PCB-127	1.0 U		0.54	20	pg/g
PCB-128/166	2.0 U		0.34	20	pg/g
PCB-129/138/163	2.0	C J	0.34	20	pg/g
PCB-130	1.0 U		0.45	20	pg/g
PCB-131	1.0 U		0.43	20	pg/g
PCB-132	1.0 U		0.42	20	pg/g
PCB-133	1.0 U		0.42	20	pg/g
PCB-134/143	2.0 U		0.46	20	pg/g
PCB-135/151	2.0 U		0.39	20	pg/g
PCB-136	1.0 U		0.30	20	pg/g
PCB-137	1.0 U		0.31	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B160000 - 107B	Work Order #....:	MQWKC1AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/16/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT	DL	LOQ	UNITS
PCB-139/140	2.0 U	0.37	20	pg/g
PCB-141	1.0 U	0.48	20	pg/g
PCB-142	1.0 U	0.50	20	pg/g
PCB-144	1.0 U	0.38	20	pg/g
PCB-145	1.0 U	0.29	20	pg/g
PCB-146	1.0 U	0.31	20	pg/g
PCB-147/149	1.8 CJ	0.37	20	pg/g
PCB-148	1.0 U	0.37	20	pg/g
PCB-150	1.0 U	0.28	20	pg/g
PCB-152	1.0 U	0.27	20	pg/g
PCB-153/168	2.0 U	0.30	20	pg/g
PCB-154	1.0 U	0.36	20	pg/g
PCB-155	1.0 U	0.29	20	pg/g
PCB-156/157	2.0 U	0.49	4.0	pg/g
PCB-158	1.0 U	0.30	20	pg/g
PCB-159	1.0 U	0.40	20	pg/g
PCB-160	1.0 U	0.38	20	pg/g
PCB-161	1.0 U	0.38	20	pg/g
PCB-162	1.0 U	0.41	20	pg/g
PCB-164	1.0 U	0.39	20	pg/g
PCB-165	1.0 U	0.32	20	pg/g
PCB-167	1.0 U	0.34	2.0	pg/g
PCB-169	1.0 U	0.47	2.0	pg/g
PCB-170	2.0 U	0.42	20	pg/g
PCB-171/173	2.0 U	0.43	20	pg/g
PCB-172	1.0 U	0.40	20	pg/g
PCB-174	1.0 U	0.49	20	pg/g
PCB-175	1.0 U	0.31	20	pg/g
PCB-176	1.0 U	0.23	20	pg/g
PCB-177	1.0 U	0.42	20	pg/g
PCB-178	1.0 U	0.32	20	pg/g
PCB-179	1.0 U	0.24	20	pg/g
PCB-180/193	2.0 U	0.34	20	pg/g
PCB-181	2.0 U	0.34	20	pg/g
PCB-182	1.0 U	0.31	20	pg/g
PCB-183	2.0 U	0.26	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B160000 - 107B	Work Order #....:	MQWKC1AA	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/16/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2047107	Instrument ID....:	12D8		
Initial Wgt/Vol :	10 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DL	LOQ	UNITS
PCB-184	1.0 U		0.25	20	pg/g
PCB-185	2.0 U		0.44	20	pg/g
PCB-186	1.0 U		0.24	20	pg/g
PCB-187	1.0 U		0.27	20	pg/g
PCB-188	1.0 U		0.28	20	pg/g
PCB-189	1.0 U		0.39	2.0	pg/g
PCB-190	1.0 U		0.28	20	pg/g
PCB-191	1.0 U		0.31	20	pg/g
PCB-192	1.0 U		0.32	20	pg/g
PCB-194	1.0 U		0.46	20	pg/g
PCB-195	1.0 U		0.48	20	pg/g
PCB-196	1.0 U		0.27	20	pg/g
PCB-197	1.0 U		0.18	20	pg/g
PCB-198/199	2.0 U		0.31	20	pg/g
PCB-200	2.0 U		0.29	20	pg/g
PCB-201	1.0 U		0.21	20	pg/g
PCB-202	1.0 U		0.25	20	pg/g
PCB-203	1.0 U		0.30	20	pg/g
PCB-204	1.0 U		0.21	20	pg/g
PCB-205	1.0 U		0.32	20	pg/g
PCB-206	1.0 U		0.43	20	pg/g
PCB-207	1.0 U		0.30	20	pg/g
PCB-208	1.0 U		0.30	20	pg/g
PCB-209	2.0 U		0.29	20	pg/g
Total MoCB	ND	U	0.43	20	pg/g
Total DiCB	ND	U	2.4	20	pg/g
Total TrCB	16		0.62	20	pg/g
Total TeCB	25		0.44	20	pg/g
Total PeCB	7.2		0.58	20	pg/g
Total HxCB	3.9		0.47	20	pg/g
Total HpCB	ND	U	0.39	20	pg/g
Total OcCB	ND	U	0.32	20	pg/g
Total NoCB	ND	U	0.43	20	pg/g

Method Blank Report

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B160000 - 107B	**Work Order #....:**	MQWKC1AA	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2047107	**Instrument ID....:**	12D8		
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
PCB-1L	39		5.0 - 145
PCB-3L	42		5.0 - 145
PCB-4L	36		5.0 - 145
PCB-19L	41		5.0 - 145
PCB-37L	66		5.0 - 145
PCB-54L	40		5.0 - 145
PCB-77L	70		10 - 145
PCB-81L	70		10 - 145
PCB-104L	49		10 - 145
PCB-105L	70		10 - 145
PCB-114L	69		10 - 145
PCB-118L	70		10 - 145
PCB-123L	71		10 - 145
PCB-126L	72		10 - 145
PCB-155L	69		10 - 145
PCB-156L/157L	93	C	10 - 145
PCB-167L	94		10 - 145
PCB-169L	92		10 - 145
PCB-188L	69		10 - 145
PCB-189L	89		10 - 145
PCB-202L	72		10 - 145
PCB-205L	80		10 - 145
PCB-206L	75		10 - 145
PCB-208L	75		10 - 145
PCB-209L	70		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
PCB-28L	61	5.0 - 145
PCB-178L	72	10 - 145
PCB-111L	69	10 - 145

QUALIFIERS

U The analyte was not detected at or above the reported estimated detection limit.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

B. If the concentration of the congener in the sample is greater than five times the concentration in the blank, no action is needed.

10.0 Labeled Internal and Cleanup Compound Recoveries

10.1 Were the samples spiked with all the labeled compounds as specified in the method? [✓] ___ ✓ ___

10.2 Are all labeled compound recoveries within the required limits ? [ ] ✓ ___

Note: The percent recovery for the Labeled Toxics/LOC/Window Defining Congeners is 25-150%, except 15-150% for $^{13}C_{12}$ -2- MoCB and $^{13}C_{12}$ -4- MoCB. 30-135% for Cleanup Standards.

10.3 If not, were samples reanalyzed? [✓] ___ ___

ACTION: 1. If the labeled compound recovery was below the lower limit, qualify as estimate with "J" the positive data for the associated compound.

2. No action on non-detects if the labeled compound recovery is above the upper limit.

3. If the labeled compound recovery is 0%, notify project officer. At a minimum, qualify positive value as estimate "J" and reject non-detects with "R" qualifier.

Sample -08 4 %R were 4 DL analyzed & OK- Exclude undiluted run

Note 1: If a labeled compound recovery is low, and the cleanup standards are not, the recovery problem may be associated with the extraction procedure or related to a particular difficult matrix. In this case, reanalysis may only serve to confirm a "matrix effect".

Note 2: Low recoveries of the labeled compounds and Cleanup standards suggest that losses may be due to the performance of the clean up steps. Re-extraction and reanalysis of the sample may yield better results.

Recalculate the percent recovery for each labeled standard in the sample extract, Rec_i, using the formula:

$$\% Rec_i = \frac{(A_{i1} + A_{i2}) \times Q_{is} \times 100}{(A_{is1} + A_{is2}) \times RF \times Q_i}$$

$A_{i1} + A_{i2}$ = integrated areas of the two quantitation ions of the appropriate labeled compound.

$A_{is1} + A_{is2}$= integrated areas of the two quantitation ions of the appropriate internal standard.

Q_i = quantity of the appropriate labeled compound

Q_{is} = quantity of the appropriate internal standard injected

RF = Response factor of the labeled compounds as determined by the five-point calibration.

11.0 Determination of CBs on a DB-1 Column

11.1 The DB-1 column is optional and is capable of uniquely resolving the congener 156 and 157 that are not resolved on the SPB-octyl column and for resolution of other CB congeners. Was the laboratory required to analyze sample extracts on the DB-1 column? [ ] ___ ✓

Note: The two-column system is capable of resolving a total of approximately 180 CB congeners.

ACTION: If yes, were the WDM, and Cleanup standards added to all samples, standards, blanks, etc? If no, check PO or project plan regarding modifications. [ ] ___ ✓

Note: Window-defining congeners - the beginning and ending congeners at each level of

chlorination are the same as for the SPB-octyl column.

12.0 Sample Reanalysis

12.1 The Project Officer will evaluate the need for reanalyzing the samples with qualified data based on site-specific Data Quality Objectives.

12.2 Due to a variety of situations (see below) that may occur during sample analysis, the laboratory is required to reanalyze or re-extract and reanalyze certain samples. If a reanalysis was required but was not performed, contact the Project Officer to initiate reanalysis. List in data assessment all re-extractions and reanalyses and identify the sample data summaries which must be used by the data user (when more than one analysis is submitted for a sample).

Lab must re-extract and/or re-analyzed samples when the following criteria are not met:

1. WDM must be met before any standard, samples, QC samples and required blank are analyzed.

2. Initial calibration criteria as outline in section 5.2.1, 5.2.3 - 5.2.9 above must be met.

3. Calibration verification standard criteria as outline in section 6.1.1 - 6.1.4 above must be met.

4. A method blank was not extracted and analyzed with each batch of samples/instrument.

ACTION: For criteria 1, 2, 3, or 4 notify the Project Officer to discuss possible re-analysis of sample by the laboratory.

13.0 Precision and Recovery (PAR)/Laboratory Control Sample (LCS)

The laboratory is required to show initial demonstration of capability, to evaluate and document data quality. Laboratory performance is compared to established performance criteria to determine if results of analyses meet the performance characteristics of the method.

The laboratory must perform and submit data to establish the ability to generate acceptable precision and accuracy.

13.1 Did the laboratory analyzed an Initial Precision and Recovery (IPR) standard containing the Native Toxics/LOC congeners, Labeled Toxics/LOC/WDM and Labeled cleanup standards? [ ] ___ ___

LCS samples were analyzed & submitted. ✓

ACTION: If no, contact the Project Officer to request resubmittals from the laboratory.

If data is not available, check the project plan or discuss the issue with the Project Officer. If a decision is made to proceed with validation, use professional judgement. All data at a minimum should be qualified as estimated "J". Technically according to the method, data and system performance is unacceptable for all compounds. Analyses should not have continued as per the method. Document under contract non-compliance in Data Assessment.

%R of targets OK. ✓

13.2 Did the IPR standard deviation (s) and average concentration (x) passed criteria as outlined below? [ ] ___ ___

1. %RSD < 40% and 60-140% recovery for Native Toxics/LOC congeners
2. %RSD < 50% and 35-135% recovery for Labeled Toxics/LOC/WDM (20-135% for $^{13}C_{12}$ -2- MoCB and $^{13}C_{12}$ -4- MoCB)
3. %RSD < 45% and 45-120% recovery for Labeled cleanup standards

No Quals required.

ACTION: If no, qualify effected congeners as estimate "J"

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot # ...:	G2B080439	Work Order # ...:	MQVQP1AD-LCS	Matrix .....:	WATER
LCS Lot-Sample# :	G2B150000 - 094				
Prep Date .....:	02/15/12	Analysis Date ..:	02/17/12		
Prep Batch # ...:	2046094				
Dilution Factor :	1				
Analyst ID.....:	Lisa L. Hernandez	Instrument ID..:	12D8	Method.....:	EPA-22 1668A
Initial Wgt/Vol:	1000 mL				

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY		RECOVERY LIMITS
PCB 1 (BZ)	2000	2120	pg/L	106		(60 - 135)
PCB 3 (BZ)	2000	2110	pg/L	106		(60 - 135)
PCB 4 (BZ)	2000	2440	pg/L	122		(60 - 135)
PCB 15 (BZ)	2000	1910	pg/L	95		(60 - 135)
PCB 19 (BZ)	2000	2130	pg/L	107		(60 - 135)
PCB 37 (BZ)	2000	1930	pg/L	97		(60 - 135)
PCB 54 (BZ)	2000	2100	pg/L	105		(60 - 135)
PCB 77 (BZ)	2000	2020	pg/L	101		(60 - 135)
PCB 81 (BZ)	2000	1980	pg/L	99		(60 - 135)
PCB 104 (BZ)	2000	2070	pg/L	104		(60 - 135)
PCB 105 (BZ)	2000	1920	pg/L	96		(60 - 135)
PCB 114 (BZ)	2000	2040	pg/L	102		(60 - 135)
PCB 118 (BZ)	2000	1960	pg/L	98		(60 - 135)
PCB 123 (BZ)	2000	1980	pg/L	99		(60 - 135)
PCB 126 (BZ)	2000	2010	pg/L	100		(60 - 135)
PCB 155 (BZ)	2000	1960	pg/L	98		(60 - 135)
PCB 156 (BZ)	4000	4120	pg/L	103	C	(60 - 135)
PCB 157 (BZ)	4000	4120	pg/L	103	C	(60 - 135)
PCB 167 (BZ)	2000	2090	pg/L	105		(60 - 135)
PCB 169 (BZ)	2000	2130	pg/L	107		(60 - 135)
PCB 188 (BZ)	2000	2020	pg/L	101		(60 - 135)
PCB 189 (BZ)	2000	1970	pg/L	99		(60 - 135)
PCB 202 (BZ)	2000	2160	pg/L	108		(60 - 135)
PCB 205 (BZ)	2000	1990	pg/L	100		(60 - 135)
PCB 206 (BZ)	2000	1970	pg/L	99		(60 - 135)
PCB 208 (BZ)	2000	2060	pg/L	103		(60 - 135)
PCB 209 (BZ)	2000	2020	pg/L	101		(60 - 135)

INTERNAL STANDARD	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	41		(15 - 145)
13C12-PCB 3	44		(15 - 145)
13C12-PCB 4	32		(15 - 145)
13C12-PCB 15	48		(15 - 145)
13C12-PCB 19	35		(15 - 145)
13C12-PCB 37	53		(15 - 145)
13C12-PCB 54	29		(15 - 145)
13C12-PCB 77	56		(40 - 145)
13C12-PCB 81	53		(40 - 145)
13C12-PCB 104	23	*	(40 - 145)
13C12-PCB 105	60		(40 - 145)

NQ

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot # ...: G2B080439 **Work Order # ...:** MQVQP1AD-LCS **Matrix .....:** WATER

LCS Lot-Sample# : G2B150000 - 094

INTERNAL STANDARD	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 114	54		(40 - 145)
13C12-PCB 118	55		(40 - 145)
13C12-PCB 123	54		(40 - 145)
13C12-PCB 126	64		(40 - 145)
13C12-PCB 155	32	*	(40 - 145)
13C12-PCB 156	85	C	(40 - 145)
13C12-PCB 157	85	C	(40 - 145)
13C12-PCB 167	80		(40 - 145)
13C12-PCB 169	88		(40 - 145)
13C12-PCB 188	44		(40 - 145)
13C12-PCB 189	85		(40 - 145)
13C12-PCB 202	56		(40 - 145)
13C12-PCB 205	84		(40 - 145)
13C12-PCB 206	81		(40 - 145)
13C12-PCB 208	69		(40 - 145)
13C12-PCB 209	77		(40 - 145)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	75	(15 - 145)
13C12-PCB 178	66	(40 - 145)
13C12-PCB 111	67	(40 - 145)

NQ

Notes:

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

* Surrogate recovery is outside stated control limits.

C Co-eluting isomer

The laboratory must analyzed an Ongoing Precision and Recovery standard (OPR) periodically, at the beginning of 12 hour shift after the analysis of the CS3 calibration verification (CV), and before the analysis of any sample in each set .

13.3 Was the Ongoing Precision and Recovery (OPR) standard analyzed at the required frequency? [ ] ___ ✓

13.4 Did the OPR standard passed the concentration criteria limits in outline below? [ ] ___ ✓

1. 50-150% recovery for Native Toxics/LOC congeners
2. 30-140% recovery for Labeled Toxics/LOC/WDM (15-140% for $^{13}C_{12}$ -2- MoCB and $^{13}C_{12}$ -4- MoCB)
3. 40-125% recovery for Labeled cleanup standards

Lab analyzed only LCS samples No Quals as all LCS samples were acceptable.

ACTION: If no, qualify affected congeners as estimate "J". All samples that do not have a passing OPR standard are potentially affected for that analyte.

Note: The laboratory might use laboratory control sample (LCS) for IPR and laboratory control sample duplicate (LCSD) for OPR.

The following sections may be incorporated in the validation process on a case by case basis depending upon the requirements of the Project Plan. Sometimes a laboratory will provide data for some of the following sections on a routine basis. If not a requirement of the Project Plan, then professional judgement is needed to qualify data based on additional information.

14.0 Toxicity Equivalency Factor (TEF)

NOTE: Certain CB congeners have been shown to cause toxic responses similar to those cause by 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD), the most potent congener. The concept of toxic equivalency factor (TEF; Reference 3) has been developed to facilitate risk assessment and regulatory control of exposure.

The TEF value concentrations are listed in the following Table 1 (Reference 3)

Target Analyte	TEF Value
CB-77	0.0001
CB-81	0.0001
CB-105	0.0001
CB-114	0.0005
CB-118	0.0001
CB-123	0.0001
CB-126	0.1
CB-156/147	0.0005
CB-167	0.00001
CB-169	0.01
CB-189	0.0001

TEF Factors / TEQ Concentrations

-020 (VWW04-CRB08-0112)

PCB	77 ✓	4.3	0.0001	0.00043
	81 ✓	0.97u	0.0003	0.00029 ?
	105 ✓	130	0.00003	0.0039
	114 ✓	9.4	0.00003	0.000282
	118 ✓	440	0.00003	0.013
	123 ✓	5.6	0.00003	0.000168
	126 ✓	1.2	0.1	0.12
	156 ✓	68	0.00003	0.002
	157	68	0.0003	0.002
	167 ✓	24	0.00003	0.00072
	169 ✓	0.97u	0.03	0.029 ?
	189 ✓	2.8	0.00003	0.000084

Total TEQ Conc. = 0.171874

LV = 0.17

* EDL values for 81 & 169 were included

When calculating the 2,3,7,8-TCDD Toxicity Equivalency of a sample for the above CB congeners, only the positive reported values must be included in the calculations. The Toxicity Equivalency (TEQ) concentration is the sum of each concentration of each individual toxic congener value and multiplied by their respective TEF value.

14.1 Did the lab include EDL values in the TEF adjusted concentration calculations? [✓] ___ ___

ACTION: 1. If yes, the toxicity equivalency calculations were not calculated properly, notify the Project Officer to arrange for laboratory resubmittals. NA Advised by CH2M that these would be recalc post-val so to note & submit DV.

NOTE: Any qualifications such as "J" applied to target compounds should be also applied to their associated total congener concentration.

15.0 Rinsate Blank/Rinse Blank *(Region 2 QA guidelines recommend rinse blanks for all projects)*

15.1 One rinsate blank should be collected for each batch of 20 soil samples or one per day. Whichever is more frequent. Were rinsate blanks collected at the above frequency? Homogenization Blks were provided. [___] ___ [✓]

15.2 Do any rinsate blanks show the presence of any CB congener at amount above the detection limits (i.e. reported as positive value)? [___] ___ [✓]

ACTION: If any qualification is needed due to rinsate blank contamination, follow the guidelines outlined under Method Blanks, section 9, Actions 1 and 2.

no rinse blk provided

16.0 Performance Evaluation Sample (PES)

NOTE: This type of sample may not be available at this time. In many cases, laboratories will substitute matrix spike/matrix spike duplicate (MS/MSD). If PEM(s) were not analyzed but MS/MSD data were submitted, skip this section and go to section 17.

16.1 One or more PES is supplied to the Laboratory. The frequency of this QC sample is one per group of 20 environmental samples or one per samples collected over one week period, whichever occurs first (check project plan).

16.2 Was a PES analyzed at the frequency described above? not CLP program [___] ___ [✓]

16.3 Were the percent recovery of CB congeners within the 50 to 150 percent control limits? [___] ___ [✓]

ACTION: 1. If any CB congener fall outside the 50-150 percent control limit, flag positive and non-detect data as estimate "J". However, if the recovery is below 20%, qualify all associated non-detects "R" and positive hits as "J". Notify the Project Officer. Reanalysis may be initiated.

17.0 Matrix Spike (MS) Field Sample

Note: Matrix spike is not required by this method although Labs may routinely perform this analysis as part of internal QA/QC and submit this data as part of the package. Verify requirements with Project Officer.

17.1 Was a matrix spike analyzed at the frequency of one per SDG samples per matrix? [✓] ___ ___

17.2 Were the percent recovery of the spiking congeners within 60 to 140 percent? [___] [✓] ___ not all were acceptable no qual

ACTION: If problems such as interferences are observed, use professional judgement to assess the quality of the data. The 60-140% limits of the matrix spike data may be used to flag data of the spiked sample only. The matrix spike data of the PE blank sample are more important and must be used primarily in data validation.

VWW06-F3030212

MATRIX SPIKE SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G2B080439 Work Order #...: MQN781AG-MS Matrix.....: BIOLOGIC
MS Lot-Sample #: G2B080439-004 MQN781AH-MSD
Date Sampled...: 02/01/12 Date Received..: 02/08/12
Prep Date.....: 02/14/12 Analysis Date..: 02/24/12
Prep Batch #...: 2045127 Analysis Time..: 01:46
Dilution Factor: 49.85 % Moisture.....:

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	
PCB 1 (BZ)	100 J	(60 - 135)			EPA-22 1668A	
	95 J	(60 - 135)	7.2	(0-25)	EPA-22 1668A	
PCB 3 (BZ)	89 J	(60 - 135)			EPA-22 1668A	
	76 J	(60 - 135)	17	(0-25)	EPA-22 1668A	
PCB 4 (BZ)	115 J	(60 - 135)			EPA-22 1668A	
	102 J	(60 - 135)	10	(0-25)	EPA-22 1668A	
PCB 15 (BZ)	96 J	(60 - 135)			EPA-22 1668A	
	75 J	(60 - 135)	15	(0-25)	EPA-22 1668A	
* PCB 19 (BZ)	104 J	(60 - 135)			EPA-22 1668A	
	63 p,J	(60 - 135)	33	(0-25)	EPA-22 1668A	NQ
* PCB 37 (BZ)	95 J,B	(60 - 135)			EPA-22 1668A	
	33	(60 - 135)	31	(0-25)	EPA-22 1668A	NQ
	Qualifiers: a,p,J,B					
PCB 54 (BZ)	94 J	(60 - 135)			EPA-22 1668A	
	91 J	(60 - 135)	5.0	(0-25)	EPA-22 1668A	
* PCB 77 (BZ) 640	175 a	(60 - 135)			EPA-22 1668A	
	96 p	(60 - 135)	28	(0-25)	EPA-22 1668A	NQ
PCB 81 (BZ)	100	(60 - 135)			EPA-22 1668A	
	82	(60 - 135)	23	(0-25)	EPA-22 1668A	
PCB 104 (BZ)	95 J	(60 - 135)			EPA-22 1668A	
	97 J	(60 - 135)	1.0	(0-25)	EPA-22 1668A	
PCB 105 (BZ) 31000	2800 a,B	(60 - 135)			EPA-22 1668A	- abundance
	0.0 a,B	(60 - 135)	0.0	(0-25)	EPA-22 1668A	
PCB 114 (BZ) 2100	324 a	(60 - 135)			EPA-22 1668A	- abundance
	71 p	(60 - 135)	36	(0-25)	EPA-22 1668A	
PCB 118 (BZ) 100000	10200	(60 - 135)			EPA-22 1668A	- abundance
	Qualifiers: a,E,B					
	0.0 a,B	(60 - 135)	0.0	(0-25)	EPA-22 1668A	
* PCB 123 (BZ) 900	215 a	(60 - 135)			EPA-22 1668A	
	91 p	(60 - 135)	33	(0-25)	EPA-22 1668A	NQ
PCB 126 (BZ)	93	(60 - 135)			EPA-22 1668A	
	67	(60 - 135)	25	(0-25)	EPA-22 1668A	
PCB 155 (BZ)	101 J	(60 - 135)			EPA-22 1668A	
	90 J	(60 - 135)	15	(0-25)	EPA-22 1668A	
PCB 156 (BZ) } 14000	1060 a,C	(60 - 135)			EPA-22 1668A	coeluters - abundance
	190 a,p,C	(60 - 135)	36	(0-25)	EPA-22 1668A	
PCB 157 (BZ) }	1060 a,C	(60 - 135)			EPA-22 1668A	
	190 a,p,C	(60 - 135)	36	(0-25)	EPA-22 1668A	
PCB 167 (BZ) 5000	604 a	(60 - 135)			EPA-22 1668A	abundance
	31 a,p	(60 - 135)	36	(0-25)	EPA-22 1668A	

(Continued on next page)

MATRIX SPIKE SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G2B080439 Work Order #...: MQN781AG-MS Matrix.....: BIOLOGIC
MS Lot-Sample #: G2B080439-004 MQN781AH-MSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
PCB 169 (BZ)	99	(60 - 135)			EPA-22 1668A
	99	(60 - 135)	2.4	(0-25)	EPA-22 1668A
PCB 188 (BZ)	94 J	(60 - 135)			EPA-22 1668A
	83 J	(60 - 135)	13	(0-25)	EPA-22 1668A
PCB 189 (BZ)	113 B	(60 - 135)			EPA-22 1668A
	95 B	(60 - 135)	11	(0-25)	EPA-22 1668A
PCB 202 (BZ)	133	(60 - 135)			EPA-22 1668A
	101	(60 - 135)	13	(0-25)	EPA-22 1668A
PCB 205 (BZ)	93 J	(60 - 135)			EPA-22 1668A
	83 J,Q	(60 - 135)	19	(0-25)	EPA-22 1668A
PCB 206 (BZ)	135	(60 - 135)			EPA-22 1668A
	86	(60 - 135)	18	(0-25)	EPA-22 1668A
PCB 208 (BZ)	114 J	(60 - 135)			EPA-22 1668A
	103 J	(60 - 135)	7.6	(0-25)	EPA-22 1668A
PCB 209 (BZ)	92 J	(60 - 135)			EPA-22 1668A
	99 J	(60 - 135)	2.8	(0-25)	EPA-22 1668A

(Continued on next page)

MATRIX SPIKE SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G2B080439 Work Order #...: MQN781AG-MS Matrix.....: BIOLOGIC
MS Lot-Sample #: G2B080439-004 MQN781AH-MSD

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 1	59	(5.0- 145)
	53	(5.0- 145)
13C12-PCB 3	63	(5.0- 145)
	62	(5.0- 145)
13C12-PCB 4	53	(5.0- 145)
	43	(5.0- 145)
13C12-PCB 15	65	(5.0- 145)
	56	(5.0- 145)
13C12-PCB 19	70	(5.0- 145)
	69	(5.0- 145)
13C12-PCB 37	86	(5.0- 145)
	81	(5.0- 145)
13C12-PCB 54	53	(5.0- 145)
	45	(5.0- 145)
13C12-PCB 77	79	(10 - 145)
	71	(10 - 145)
13C12-PCB 81	77	(10 - 145)
	66	(10 - 145)
13C12-PCB 104	61	(10 - 145)
	49	(10 - 145)
13C12-PCB 105	82	(10 - 145)
	69	(10 - 145)
13C12-PCB 114	76	(10 - 145)
	65	(10 - 145)
13C12-PCB 118	80	(10 - 145)
	70	(10 - 145)
13C12-PCB 123	74	(10 - 145)
	69	(10 - 145)
13C12-PCB 126	72	(10 - 145)
	59	(10 - 145)
13C12-PCB 155	65	(10 - 145)
	60	(10 - 145)
13C12-PCB 156	86 C	(10 - 145)
	74 C	(10 - 145)
13C12-PCB 157	86 C	(10 - 145)
	74 C	(10 - 145)
13C12-PCB 167	87	(10 - 145)
	78	(10 - 145)
13C12-PCB 169	76	(10 - 145)
	69	(10 - 145)
13C12-PCB 188	70	(10 - 145)
	75	(10 - 145)

(Continued on next page)

MATRIX SPIKE SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G2B080439 Work Order #...: MQN781AG-MS Matrix.....: BIOLOGIC
MS Lot-Sample #: G2B080439-004 MQN781AH-MSD

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 189	86	(10 - 145)
	89	(10 - 145)
13C12-PCB 202	74	(10 - 145)
	74	(10 - 145)
13C12-PCB 205	87	(10 - 145)
	91	(10 - 145)
13C12-PCB 206	91	(10 - 145)
	98	(10 - 145)
13C12-PCB 208	81	(10 - 145)
	81	(10 - 145)
13C12-PCB 209	80	(10 - 145)
	77	(10 - 145)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	89	(5.0- 145)
	83	(5.0- 145)
13C12-PCB 178	77	(10 - 145)
	62	(10 - 145)
13C12-PCB 111	75	(10 - 145)
	70	(10 - 145)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

J Estimated result. Result is less than the reporting limit.

p Relative percent difference (RPD) is outside stated control limits.

C Co-eluting isomer.

a Spiked analyte recovery is outside stated control limits

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Q Estimated maximum possible concentration (EMPC).

E Estimated result. Result concentration exceeds the calibration range.

MATRIX SPIKE SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...:	G2B080439	Work Order #...:	MQN8V1AJ-MS	Matrix.....:	BIOLOGIC
MS Lot-Sample #:	G2B080439-014		MQN8V1AK-MSD		
Date Sampled...:	01/31/12	Date Received..:	02/08/12		
Prep Date.....:	02/16/12	Analysis Date..:	02/24/12		
Prep Batch #...:	2047107	Analysis Time..:	20:01		
Dilution Factor:	4.89	% Moisture.....:			

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
PCB 105 (BZ)	35 a,B	(60 - 135)			EPA-22 1668A
	76 B	(60 - 135)	7.3	(0-25)	EPA-22 1668A
PCB 118 (BZ)	8.6 a,B	(60 - 135)			EPA-22 1668A
	62 B	(60 - 135)	3.4	(0-25)	EPA-22 1668A

abundance

abundance

no Quals

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 105	74	(10 - 145)
	70	(10 - 145)
13C12-PCB 118	73	(10 - 145)
	73	(10 - 145)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 111	71	(10 - 145)
	72	(10 - 145)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

a Spiked analyte recovery is outside stated control limits.

MATRIX SPIKE SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...:	G2B080439	Work Order #...:	MQN8V1AJ-MS
MS Lot-Sample #:	G2B080439-014		MQN8V1AK-MSD
Date Sampled...:	01/31/12	Date Received..:	02/08/12
Prep Date.....:	02/16/12	Analysis Date..:	02/24/12
Prep Batch #...:	2047107	Analysis Time..:	20:01
Dilution Factor:	4.89	% Moisture.....:	

Matrix.....: BIOLOGIC

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
PCB 105 (BZ)	2000	391	2140	pg/g	35 a,B		EPA-22 1668A
	2000	393	2300	pg/g	76 B	7.3	EPA-22 1668A
PCB 118 (BZ)	6100	391	6110	pg/g	8.6		EPA-22 1668A
	Qualifiers: a,B						
	6100	393	6320	pg/g	62 B	3.4	EPA-22 1668A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 105	74	(10 - 145)
	70	(10 - 145)
13C12-PCB 118	73	(10 - 145)
	73	(10 - 145)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 111	71	(10 - 145)
	72	(10 - 145)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

a Spiked analyte recovery is outside stated control limits.

17.3 Was a matrix spike duplicate analyzed? [✓] ___ ___

ACTION: No action required. A matrix spike duplicate is not required. Use professional judgement if there is a large difference in concentrations reported between MS and MSD. Qualifications if any, can only be performed on the sample that was used for this criteria.

18.0 Environmental Duplicate Samples *(recommended in Region 2 for all Projects)*

NOTE: Do not confuse an environmental duplicate with a matrix spike duplicate. An environmental duplicate is a sample that has been divided into 2 parts (extracted and analyzed as two different samples) or as 2 separate samples from the same location sent by the sampling crew. This sample is not spike with any additional compounds other than those compounds required by the method for analysis of all routine samples.

18.1 For every batch of 20 samples or samples collected over a period of one week, whichever is less, there must be a sample designated as duplicate. Were duplicate samples collected at the above frequency? [✓] ___ ___

18.2 Did results of the duplicate samples agree within 25% relative difference for water samples and 50% for other type of samples? [✓] ___ ___

ACTION: The duplicate results can be used in conjunction of other QC data. Use professional judgement.

19.0 REFERENCES

They are important references for technical information and are submitted here as part of this method's documentation.

1. Method 1668, Revision A, "Chlorinated Biphenyl Congeners in Water, Soil, sediment, Biosolids and Tissue by HRGC/HRMS, August 20, 2003.

2. EPA Statement of Work for Chlorinated Biphenyl (CB) Congeners, Multi-Media, Multi-Concentration, CBC01.0, May 2005.

3. Van den Berg, Linda Birnbaum, Albetus T.C., "Environmental Health Perspectives 106:12, 775-792, 1998.

CRB05 / CRB05P

Field Duplicate
CRB05

Sample_Name	Duplicate_ID	Chem_Name	Analyte_Value	Lab Flag	Dup Analyte_Value	Lab Flag	RPD	Action
VWW06-CRB05-0212	VWW06-CRB05P-0212	2-Chlorobiphenyl (1)	1.90	U	2	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3-Chlorobiphenyl (2)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	4-Chlorobiphenyl (3)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2'-Dichlorobiphenyl (4)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3-Dichlorobiphenyl (5)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3'-Dichlorobiphenyl (6)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,4-Dichlorobiphenyl (7)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,4'-Dichlorobiphenyl (8)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,5-Dichlorobiphenyl (9)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,6-Dichlorobiphenyl (10)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3'-Dichlorobiphenyl (11)	8.6	J	21		83.78%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (13/12)	19	U	20	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,5-Dichlorobiphenyl (14)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	4,4'-Dichlorobiphenyl (15)	9.7	U	9.9	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3-Trichlorobiphenyl (16)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',4-Trichlorobiphenyl (17)	0.97	U	0.64	J B	-40.99%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (30/18)	1.9	U C J B	2.0	U C J B	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',6-Trichlorobiphenyl (19)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (28/20)	2.5	C J B	2.7	C J Q B	7.69%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (21/33)	1.9	U	2.0	U C J Q B	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,4'-Trichlorobiphenyl (22)	0.97	U	0.71	J B	-30.95%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,5-Trichlorobiphenyl (23)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,6-Trichlorobiphenyl (24)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',4-Trichlorobiphenyl (25)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (26/29)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',6-Trichlorobiphenyl (27)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,4',5-Trichlorobiphenyl (31)	1.2	J B	1.5	J Q B	22.22%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,4',6-Trichlorobiphenyl (32)	0.52	J	0.59	J	12.61%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',5'-Trichlorobiphenyl (34)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',4-Trichlorobiphenyl (35)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',5-Trichlorobiphenyl (36)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,4,4'-Trichlorobiphenyl (37)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,4,5-Trichlorobiphenyl (38)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,4',5-Trichlorobiphenyl (39)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (40/71)	0.85	C J	1.1	C J	25.64%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4-Tetrachlorobiphenyl (41)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4'-Tetrachlorobiphenyl (42)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,5-Tetrachlorobiphenyl (43)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (44/47/65)	11	C J B	11	C J B	0.00%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,6-Tetrachlorobiphenyl (45)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,6'-Tetrachlorobiphenyl (46)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',4,5-Tetrachlorobiphenyl (48)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (69/49)	1.1	C J Q	0.85	C J Q	-25.64%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (50/53)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',4,6'-Tetrachlorobiphenyl (51)	1.6	J Q	1.0	J Q	-46.15%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',5,5'-Tetrachlorobiphenyl (52)	2.8	J B	3.8	J B	30.30%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',6,6'-Tetrachlorobiphenyl (54)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4-Tetrachlorobiphenyl (55)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4'-Tetrachlorobiphenyl (56)	0.97	U J	0.99	U J Q	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',5-Tetrachlorobiphenyl (57)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',5'-Tetrachlorobiphenyl (58)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (59/62/75)	2.9	U	3.0	U	3.39%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,4,4'-Tetrachlorobiphenyl (60)	1.2	J Q	2.0	U J Q	50.00%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (61/70/74/76)	7.6	C J B	7.4	C J Q B	-2.67%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,4',5-Tetrachlorobiphenyl (63)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,4',6-Tetrachlorobiphenyl (64)	1.3	J B	1.2	J Q B	-8.00%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',4,4'-Tetrachlorobiphenyl (66)	6.8	J Q B	8.2	J B	18.67%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',4,5-Tetrachlorobiphenyl (67)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',4,5'-Tetrachlorobiphenyl (68)	1.9	U J	2.0	U J Q	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',5,5'-Tetrachlorobiphenyl (72)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',5',6-Tetrachlorobiphenyl (73)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',4,4'-Tetrachlorobiphenyl (77)	0.77	J	0.54	J	-35.11%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',4,5-Tetrachlorobiphenyl (78)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',4,5'-Tetrachlorobiphenyl (79)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',5,5'-Tetrachlorobiphenyl (80)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,4,4',5-Tetrachlorobiphenyl (81)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4-Pentachlorobiphenyl (82)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',5-Pentachlorobiphenyl (83)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',6-Pentachlorobiphenyl (84)	0.97	U	1.3	J Q	29.07%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (117/116/85)	4.6	C J	4.7	C J Q	2.15%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (86/87/97/108/119/125)	3.0	C J	3.4	C J Q	12.50%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (88/91)	1.9	U C J	1.4	C J Q	-30.30%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,6'-Pentachlorobiphenyl (89)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (113/90/101)	7.3	C J B	9.2	C J B	23.03%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,5,5'-Pentachlorobiphenyl (92)	0.97	U	1.4	J	36.29%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (93/100)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,5,6'-Pentachlorobiphenyl (94)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,5',6-Pentachlorobiphenyl (95)	2.4	J B	3.5	J B	37.29%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,6,6'-Pentachlorobiphenyl (96)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (98/102)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',4,4',5-Pentachlorobiphenyl (99)	18	J	20	J	10.53%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',4,5',6-Pentachlorobiphenyl (103)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',4,6,6'-Pentachlorobiphenyl (104)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,4'-Pentachlorobiphenyl (105)	9.8	B	11	B	11.54%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,5-Pentachlorobiphenyl (106)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,6-Pentachlorobiphenyl (109)	1.9	J Q	2.2	J Q	14.63%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (107/124)	5.8	U	5.9	U	1.71%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (110/115)	18	C J B	21	C J B	15.38%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',5,5'-Pentachlorobiphenyl (111)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',5,6-Pentachlorobiphenyl (112)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,4,4',5-Pentachlorobiphenyl (114)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',4,4',5-Pentachlorobiphenyl (118)	32	B	34	B	6.06%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',4,5,5'-Pentachlorobiphenyl (120)	0.97	U	0.99	U	2.04%	in

NQ < LOQ

NQ < LOQ

NQ < LOQ

NQ < LOQ

NQ < LOQ

NQ < LOQ

NQ < LOQ

Sample_Name	Duplicate_ID	Chem_Name	Analyte_Value	Lab Flag	Dup Analyte_Value	Lab Flag	RPD	Action
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4',5'-Pentachlorobiphenyl (122)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',4,4',5'-Pentachlorobiphenyl (123)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',4,4',5-Pentachlorobiphenyl (126)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',4,5,5'-Pentachlorobiphenyl (127)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (128/166)	4.5	C J	4.8	C J	6.45%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (138/163/129)	33	C B	35	C J B	5.88%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	1.6	J	2.2	J	31.58%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,6-Hexachlorobiphenyl (131)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	0.97	U	0.71	J Q	-30.95%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (134/143)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (151/135)	1.9	U	1.4	C J Q	-30.30%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	0.97	U	0.99	U J Q	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,4',5-Hexachlorobiphenyl (137)	0.62	J Q	0.99	U J Q	45.96%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (139/140)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	0.97	U	1.0	J Q	3.05%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,5,6-Hexachlorobiphenyl (142)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,5',6-Hexachlorobiphenyl (144)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	4.0	J Q	4.4	J	9.52%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (147/149)	4.4	C J Q B	6.4	C J B	37.04%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (153/168)	35	C	37	C	5.56%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	0.97	U	0.80	J Q	-19.21%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (156/157)	5.2	C	4.9	C	-5.94%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,4',6-Hexachlorobiphenyl (158)	3.4	J	3.5	J	2.90%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,5,6-Hexachlorobiphenyl (160)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,5',6-Hexachlorobiphenyl (161)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	0.97	U J Q	0.99	U J Q	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4',5',6-Hexachlorobiphenyl (164)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',5,5',6-Hexachlorobiphenyl (165)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	1.8	J	1.6	J	-11.76%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	5.8	J Q	5.0	J Q	-14.81%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (171/173)	1.7	C J	1.7	C J	0.00%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	1.3	J	1.4	J	7.41%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	2.7	J	2.9	J	7.14%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	1.5	J	1.4	J Q	-6.90%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (180/193)	11	C J	12	C J	8.70%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	2.6	J	2.6	J Q	0.00%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	4.5	J	4.7	J	4.35%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	0.97	U	0.99	U J	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	1.4	J	1.2	J Q	-15.38%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	1.0	J	1.0	J Q	0.00%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	0.97	U	0.99	U J Q	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Congeners (198/199)	2.6	C J	2.3	C J Q	-12.24%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	1.9	U	2.0	U	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	0.97	U	0.99	U J	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	0.97	J	1.3	J	29.07%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	1.2	J	0.92	J Q	-26.42%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	0.97	U	0.99	U	2.04%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	1.5	J Q	0.88	J Q	-52.10%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Decachlorobiphenyl (209)	1.9	U J	2.0	U J Q	5.13%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Monochlorobiphenyls	0	U	0	U	#DIV/0!	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Dichlorobiphenyls	8.6		21		83.78%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Trichlorobiphenyls	4.9		7.4		40.65%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Tetrachlorobiphenyls	37		37		0.00%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Pentachlorobiphenyls	97		110		12.56%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Hexachlorobiphenyls	94		100		6.19%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Heptachlorobiphenyls	31		32		3.17%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Octachlorobiphenyls	7.3		7.6		4.03%	in
VWW06-CRB05-0212	VWW06-CRB05P-0212	Total Nonachlorobiphenyls	1.5		0.88		-52.10%	out
VWW06-CRB05-0212	VWW06-CRB05P-0212	Toxic Equivalents (Total TEQ)	0.0737		0.0016		-191.50%	out

NQ < LOQ

NQ < LOQ

NQ < LOQ

NQ < LOQ

Note: no action unless results are > LOQ in both samples

Field Duplicate
FS05

Sample_Name	Duplicate_ID	Chem_Name	Analyte_Value	Lab Flag	Dup Analyte_Value	Lab Flag	RPD	RPD IN/OUT	ACTION	LOQ
VWW06-FS05-0212	VWW06-FS05P-0212	2-Chlorobiphenyl (1)	1.9	U	2.0	U	5.13%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3-Chlorobiphenyl (2)	1.9	U	2.0	U	5.13%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	4-Chlorobiphenyl (3)	1.1	J	0.98	U	-11.54%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2'-Dichlorobiphenyl (4)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3-Dichlorobiphenyl (5)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3'-Dichlorobiphenyl (6)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,4-Dichlorobiphenyl (7)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,4'-Dichlorobiphenyl (8)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,5-Dichlorobiphenyl (9)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,6-Dichlorobiphenyl (10)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,3'-Dichlorobiphenyl (11)	8.2	J B	9.8	U	17.78%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (13/12)	19	U	20	U	5.13%	in		39
VWW06-FS05-0212	VWW06-FS05P-0212	3,5-Dichlorobiphenyl (14)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	4,4'-Dichlorobiphenyl (15)	9.7	U	9.8	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3-Trichlorobiphenyl (16)	0.81	J Q	0.98	U	18.99%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',4-Trichlorobiphenyl (17)	1.1	J	0.98	U	-11.54%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (30/18)	2.0	C J B	1.6	C J B	-22.22%	in		39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',6-Trichlorobiphenyl (19)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (28/20)	6.6	C J B	4.2	C J Q B	-44.44%	out	NQ	39
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (21/33)	2.1	C J B	2.0	U C J B	-4.88%	in		39
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,4'-Trichlorobiphenyl (22)	1.2	J	0.98	U	-20.18%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,5-Trichlorobiphenyl (23)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,6-Trichlorobiphenyl (24)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4-Trichlorobiphenyl (25)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (26/29)	0.82	C J Q	0.67	C J	-20.13%	in		39
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',6-Trichlorobiphenyl (27)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,4',5-Trichlorobiphenyl (31)	5.0	J B	2.5	J B	-66.67%	out	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,4',6-Trichlorobiphenyl (32)	1.3	J B	0.98	U	-28.07%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',5'-Trichlorobiphenyl (34)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',4-Trichlorobiphenyl (35)	1.9	U	2.0	U	5.13%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',5-Trichlorobiphenyl (36)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,4,4'-Trichlorobiphenyl (37)	1.0	J B	0.98	U	-2.02%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,4,5-Trichlorobiphenyl (38)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,4',5-Trichlorobiphenyl (39)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (40/71)	2.2	C J	0.84	C J Q	-89.47%	out	NQ	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4-Tetrachlorobiphenyl (41)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4'-Tetrachlorobiphenyl (42)	0.80	J Q	0.98	U	20.22%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,5-Tetrachlorobiphenyl (43)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (44/47/65)	19	C J B	13	C J B	-37.50%	out	NQ	59
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,6-Tetrachlorobiphenyl (45)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,6'-Tetrachlorobiphenyl (46)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',4,5-Tetrachlorobiphenyl (48)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (69/49)	12	C J B	5.3	C J B	-77.46%	out	NQ	39
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (50/53)	1.6	C J	2.0	U	22.22%	in		39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',4,6'-Tetrachlorobiphenyl (51)	1.5	J Q	1.6	J	6.45%	out		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',5,5'-Tetrachlorobiphenyl (52)	34	B	14	J B	-83.33%	out	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',6,6'-Tetrachlorobiphenyl (54)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4-Tetrachlorobiphenyl (55)	1.9	U	2.0	U	5.13%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4'-Tetrachlorobiphenyl (56)	2.2	J	0.98	U	-76.73%	in	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',5-Tetrachlorobiphenyl (57)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',5'-Tetrachlorobiphenyl (58)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (59/62/75)	0.87	C J	2.9	U	107.69%	out	NQ	59
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,4,4'-Tetrachlorobiphenyl (60)	2.1	J	2.0	U	-4.88%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (61/70/74/76)	24	C J B	15	C J B	-46.15%	out	NQ	78
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,4',5-Tetrachlorobiphenyl (63)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,4',6-Tetrachlorobiphenyl (64)	4.5	J	1.9	J	-81.25%	out	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4,4'-Tetrachlorobiphenyl (66)	12	J	8.0	J Q	-40.00%	out	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4,5-Tetrachlorobiphenyl (67)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4,5'-Tetrachlorobiphenyl (68)	1.9	U J Q	2.0	U	5.13%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',5,5'-Tetrachlorobiphenyl (72)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',5',6-Tetrachlorobiphenyl (73)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',4,4'-Tetrachlorobiphenyl (77)	0.97	U	0.98	U	1.03%	in		2.0
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',4,5-Tetrachlorobiphenyl (78)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',4,5'-Tetrachlorobiphenyl (79)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',5,5'-Tetrachlorobiphenyl (80)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	3,4,4',5-Tetrachlorobiphenyl (81)	0.97	U	0.98	U	1.03%	in		2.0
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4-Pentachlorobiphenyl (82)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',5-Pentachlorobiphenyl (83)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',6-Pentachlorobiphenyl (84)	4.6	J	2.3	J Q	-66.67%	out	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (117/116/85)	6.6	C J	3.4	C J Q	-64.00%	out	NQ	59
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (86/87/97/108/119/125)	18	C J	9.8	C J	-58.99%	out	NQ	120
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (88/91)	5.2	C J	2.2	C J	-81.08%	out	NQ	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,6'-Pentachlorobiphenyl (89)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (113/90/101)	47	C J B	28	C J B	-50.67%	out	NQ	59
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,5,5'-Pentachlorobiphenyl (92)	9.2	J	4.8	J Q	-62.86%	out	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (93/100)	1.9	U	2.0	U	5.13%	in		39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,5,6'-Pentachlorobiphenyl (94)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,5',6-Pentachlorobiphenyl (95)	26	B	11	J B	-81.08%	out	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,6,6'-Pentachlorobiphenyl (96)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (98/102)	1.9	U	2.0	U	5.13%	in		39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',4,4',5-Pentachlorobiphenyl (99)	24		20	J	-18.18%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',4,5',6-Pentachlorobiphenyl (103)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',4,6,6'-Pentachlorobiphenyl (104)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,4'-Pentachlorobiphenyl (105)	13	B	13	B	0.00%	in		2.0
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,5-Pentachlorobiphenyl (106)	1.9	U	2.0	U	5.13%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,6-Pentachlorobiphenyl (109)	2.9	J Q	2.1	J Q	-32.00%	out	NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (107/124)	5.8	U	5.9	U	1.71%	in		39
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (110/115)	33	C J B	19	C J B	-53.85%	out	NQ	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',5,5'-Pentachlorobiphenyl (111)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',5,6-Pentachlorobiphenyl (112)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,4,4',5-Pentachlorobiphenyl (114)	0.97	U	0.98	U	1.03%	in		2.0
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4,4',5-Pentachlorobiphenyl (118)	34	B	34	B	0.00%	in		2.0
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4,5,5'-Pentachlorobiphenyl (120)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4,5',6-Pentachlorobiphenyl (121)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4',5'-Pentachlorobiphenyl (122)	0.97	U	0.98	U	1.03%	in		20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4,4',5'-Pentachlorobiphenyl (123)	0.97	U	0.98	U	1.03%	in		2.0
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',4,4',5-Pentachlorobiphenyl (126)	0.97	U	0.98	U	1.03%	in		2.0
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',4,5,5'-Pentachlorobiphenyl (127)	0.97	U	0.98	U	1.03%	in		20

VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (128/166)	5.1	C J Q	6.5	C J	24.14%	in	39
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (138/163/129)	40	C J	45	C	11.76%	in	59
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	1.5	J Q	0.98	U	-41.94%	out NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,6-Hexachlorobiphenyl (131)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	4.2	J Q	3.2	J	-27.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (134/143)	1.9	U	2.0	U	5.13%	out	39
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (151/135)	6.0	C J	3.6	C J Q	-50.00%	out NQ	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	2.5	J Q	0.98	U	-87.36%	out NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,4',5-Hexachlorobiphenyl (137)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (139/140)	1.9	U	2.0	U	5.13%	in	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	4.4	J	3.6	J Q	-20.00%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,5,6-Hexachlorobiphenyl (142)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,5',6-Hexachlorobiphenyl (144)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	7.5	J	9.4	J	22.49%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (147/149)	14	C J	8.2	C J	-52.25%	out NQ	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (153/168)	45	C	51	C	12.50%	in	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (156/157)	4.7	C	5.7	C	19.23%	in	3.9
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,4',6-Hexachlorobiphenyl (158)	3.2	J Q	3.6	J Q	11.76%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,5,6-Hexachlorobiphenyl (160)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,5',6-Hexachlorobiphenyl (161)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	0.97	U J	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4',5',6-Hexachlorobiphenyl (164)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',5,5',6-Hexachlorobiphenyl (165)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	2.3	Q	2.0	J Q	-13.95%	in	2.0
VWW06-FS05-0212	VWW06-FS05P-0212	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	0.97	U	0.98	U	1.03%	in	2.0
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	9.2	J Q	13	J	34.23%	out NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (171/173)	1.9	U	2.4	C J Q	23.26%	in	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	2.8	J Q	3.3	J	16.39%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	2.4	J Q	2.3	J Q	-4.26%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	2.9	J	3.4	J	15.87%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	1.6	J	0.98	U	-48.06%	out NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	0.61	J Q	0.98	U	46.54%	out NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (180/193)	22	C J	26	C	16.67%	in	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	1.9	U	2.0	U	5.13%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	5.8	J	5.6	J Q	-3.51%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	1.9	U	2.0	U	5.13%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	15	J	19	J	23.53%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	0.97	U	0.98	U	1.03%	in	2.0
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	3.2	J	3.7	J	14.49%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	3.9	J	4.4	J	12.05%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	0.81	J	1.2	J	38.81%	out NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	Congeners (198/199)	12	C J	16	C J	28.57%	in	39
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	1.9	U	2.0	U	5.13%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	2.0	J Q	2.0	J Q	0.00%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2.0	J Q	2.6	J	26.09%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	2.8	J Q	3.2	J	13.33%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	0.97	U	0.98	U	1.03%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	4.6	J Q	6.3	J	31.19%	out NQ	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	1.8	J	2.0	J Q	10.53%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	3.8	J	5.0	J	27.27%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	Decachlorobiphenyl (209)	4.4	J	4.5	J Q	2.25%	in	20
VWW06-FS05-0212	VWW06-FS05P-0212	Total Monochlorobiphenyls	1.1		0	U	-200.00%	in	
VWW06-FS05-0212	VWW06-FS05P-0212	Total Dichlorobiphenyls	8.2		0	U	-200.00%	in	
VWW06-FS05-0212	VWW06-FS05P-0212	Total Trichlorobiphenyls	22		11		-66.67%	out NQ	
VWW06-FS05-0212	VWW06-FS05P-0212	Total Tetrachlorobiphenyls	120		60		-66.67%	out NQ	
VWW06-FS05-0212	VWW06-FS05P-0212	Total Pentachlorobiphenyls	220		150		-37.84%	out NQ	
VWW06-FS05-0212	VWW06-FS05P-0212	Total Hexachlorobiphenyls	140		140		0.00%	in	
VWW06-FS05-0212	VWW06-FS05P-0212	Total Heptachlorobiphenyls	62		75		18.98%	in	
VWW06-FS05-0212	VWW06-FS05P-0212	Total Octachlorobiphenyls	27		33		20.00%	in	
VWW06-FS05-0212	VWW06-FS05P-0212	Total Nonachlorobiphenyls	10		13		26.09%	in	
VWW06-FS05-0212	VWW06-FS05P-0212	Toxic Equivalents (Total TEQ)	0.0736		0.00164			NA	

Sample_Name	Duplicate_ID	Chem_Name	Analyte_Value	Lab Flag	Dup Analyte_Value	Lab Flag	RPD	RPD IN/OUT	ACTION	LOQ
VWW06-FS01-0112	VWW06-FS01P-0112	2-Chlorobiphenyl (1)	2.2	J Q	2.8	J	24.00%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3-Chlorobiphenyl (2)	2.0	U J Q	1.9	U J Q	-5.13%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	4-Chlorobiphenyl (3)	0.89	J	0.91	J Q	2.22%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2'-Dichlorobiphenyl (4)	9.7	J	12	J	21.20%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3-Dichlorobiphenyl (5)	9.9	U	9.4	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3'-Dichlorobiphenyl (6)	7.2	J	8.4	J Q	15.38%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,4-Dichlorobiphenyl (7)	9.9	U	9.4	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,4'-Dichlorobiphenyl (8)	24		25		4.08%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,5-Dichlorobiphenyl (9)	9.9	U	9.4	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,6-Dichlorobiphenyl (10)	9.9	U	9.4	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3'-Dichlorobiphenyl (11)	16	J B	25	B	43.90%	out	NQ	20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (13/12)	20	U	19	U C J	-5.13%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	3,5-Dichlorobiphenyl (14)	9.9	U	9.4	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	4,4'-Dichlorobiphenyl (15)	9.9	U	9.4	U J	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3-Trichlorobiphenyl (16)	5.9	J	6.9	J Q	15.63%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',4-Trichlorobiphenyl (17)	9.3	J	11	J	16.75%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (30/18)	26	C J B	28	C J B	7.41%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',6-Trichlorobiphenyl (19)	9.8	J	11	J	11.54%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (28/20)	230	C B	260	C B	12.24%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (21/33)	23	C J B	26	C J B	12.24%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,4'-Trichlorobiphenyl (22)	31		35		12.12%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,5-Trichlorobiphenyl (23)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,6-Trichlorobiphenyl (24)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4-Trichlorobiphenyl (25)	12	J	13	J	8.00%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (26/29)	34	C J	39	C	13.70%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',6-Trichlorobiphenyl (27)	3.5	J	3.3	J Q	-5.88%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,4',5-Trichlorobiphenyl (31)	140	B	160	B	13.33%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,4',6-Trichlorobiphenyl (32)	23	B	26	B	12.24%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',5'-Trichlorobiphenyl (34)	2.2	J Q	1.5	J Q	-37.84%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',4-Trichlorobiphenyl (35)	2.0	U	1.9	U	-5.13%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',5-Trichlorobiphenyl (36)	15	J	17	J	12.50%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,4,4'-Trichlorobiphenyl (37)	3.1	J B	3.5	J B	12.12%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,4,5-Trichlorobiphenyl (38)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,4',5-Trichlorobiphenyl (39)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (40/71)	31	C J	29	C J	-6.67%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4-Tetrachlorobiphenyl (41)	0.99	U	1.0	U	1.01%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4'-Tetrachlorobiphenyl (42)	9.5	J	9.5	J	0.00%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,5-Tetrachlorobiphenyl (43)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (44/47/65)	420	C B	440	C B	4.65%	in		59
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,6-Tetrachlorobiphenyl (45)	13	J	17	J	26.67%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,6'-Tetrachlorobiphenyl (46)	3.3	J Q	3.8	J	14.08%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',4,5-Tetrachlorobiphenyl (48)	2.5	J Q	1.8	J Q	-32.56%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (69/49)	520	C B	560	C B	7.41%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (50/53)	43	C	47	C	8.89%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',4,6'-Tetrachlorobiphenyl (51)	8.8	J	7.7	J	-13.33%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',6,6'-Tetrachlorobiphenyl (54)	3.2	J	3.8	J	17.14%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4-Tetrachlorobiphenyl (55)	2.0	U	1.9	U	-5.13%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4'-Tetrachlorobiphenyl (56)	37		39		5.26%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',5-Tetrachlorobiphenyl (57)	33		31	Q	-6.25%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',5'-Tetrachlorobiphenyl (58)	0.99	U	0.97	U	-2.04%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (59/62/75)	52	C J	54	C J	3.77%	in		59
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,4,4'-Tetrachlorobiphenyl (60)	160		180		11.76%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (61/70/74/76)	2300	C B	2400	C B	4.26%	in		78
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,4',5-Tetrachlorobiphenyl (63)	57		62		8.40%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,4',6-Tetrachlorobiphenyl (64)	170		180		5.71%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4,4'-Tetrachlorobiphenyl (66)	1300		1400		7.41%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4,5-Tetrachlorobiphenyl (67)	13	J	15	J	14.29%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4,5'-Tetrachlorobiphenyl (68)	23		22	Q	-4.44%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',5,5'-Tetrachlorobiphenyl (72)	28		32		13.33%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',5',6-Tetrachlorobiphenyl (73)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',4,4'-Tetrachlorobiphenyl (77)	15		17		12.50%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',4,5-Tetrachlorobiphenyl (78)	0.99	U	1.1	U	10.53%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',4,5'-Tetrachlorobiphenyl (79)	19	J	21	Q	10.00%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',5,5'-Tetrachlorobiphenyl (80)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,4,4',5-Tetrachlorobiphenyl (81)	0.99	U	2.8	Q	95.51%	out	NQ	2.0
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4-Pentachlorobiphenyl (82)	16	J	15	J Q	-6.45%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',5-Pentachlorobiphenyl (83)	1.5	U	1.9	U	23.53%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',6-Pentachlorobiphenyl (84)	97		110		12.56%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (117/116/85)	930	C	1100	C	16.75%	in		59
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (86/87/97/108/119/125)	710	C	870	C	14.38%	in		120
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (88/91)	180	C	190	C	5.41%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,6'-Pentachlorobiphenyl (89)	1.6	U	2.1	U	27.03%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (113/90/101)	3800	C B	4300	C B	12.35%	in		59
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,5,5'-Pentachlorobiphenyl (92)	880		990		11.76%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (93/100)	27	C J	30	C J	10.53%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,5,6'-Pentachlorobiphenyl (94)	1.6	U	2.1	J Q	27.03%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,5',6-Pentachlorobiphenyl (95)	780	B	850	B	8.59%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,6,6'-Pentachlorobiphenyl (96)	3.3	J	3.9	J	16.67%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (98/102)	2.2	C J Q	2.0	U	-9.52%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',4,5',6-Pentachlorobiphenyl (103)	27		29		7.14%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',4,6,6'-Pentachlorobiphenyl (104)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,5-Pentachlorobiphenyl (106)	2.0	U	1.9	U	-5.13%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,6-Pentachlorobiphenyl (109)	550		630		13.56%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (107/124)	210	C	250	C	17.39%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (110/115)	1200	C B	1400	C B	15.38%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',5,5'-Pentachlorobiphenyl (111)	6.5	J	6.6	J	1.53%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',5,6-Pentachlorobiphenyl (112)	1.4	U	1.9	U	30.30%	out	NQ	39
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,4,4',5-Pentachlorobiphenyl (114)	170		200		16.22%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4,5,5'-Pentachlorobiphenyl (120)	42		50		17.39%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4,5',6-Pentachlorobiphenyl (121)	2.7	J	2.4	J Q	-11.76%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4',5'-Pentachlorobiphenyl (122)	1.2	U	1.5	U	22.22%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4,4',5'-Pentachlorobiphenyl (123)	82		120		37.62%	out	J IN BOTH	20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',4,4',5-Pentachlorobiphenyl (126)	26		20		-26.09%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',4,5,5'-Pentachlorobiphenyl (127)	13	J	13	J	0.00%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (128/166)	990	C	1200	C	19.18%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	320		380		17.14%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,6-Hexachlorobiphenyl (131)	3.9	J	4.1	J	5.00%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	120		140		15.38%	in		39

VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	63		75		17.39%	in		59
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (134/143)	14	C J	17	C J	19.35%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (151/135)	320	C	380	C	17.14%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	48		56		15.38%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,4',5-Hexachlorobiphenyl (137)	240		270		11.76%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (139/140)	100	C	120	C	18.18%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,5,5'-Hexachlorobipbenyl (141)	580		700		18.75%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,5,6-Hexachlorobiphenyl (142)	0.99	U	1.2	U	19.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,5',6-Hexachlorobiphenyl (144)	76		89		15.76%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	0.99	U	0.94	U	-5.18%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4',5,5'-Hexachiorobiphenyl (146)	960		1100		13.59%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (147/149)	390	C	450	C	14.29%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	4.2	J	5.2	J Q	21.28%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	1.0	J Q	0.94	U	-6.19%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	61		73		17.91%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	1.8	J Q	2.1	J Q	15.38%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (156/157)	1500	C	1700	C	12.50%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,4',6-Hexachlorobiphenyl (158)	790		950		18.39%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	1.2	U	1.6	U	28.57%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,5,6-Hexachlorobiphenyl (160)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,5',6-Hexachlorobiphenyl (161)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	58		69		17.32%	in		3.9
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4',5',6-Hexachlorobiphenyl (164)	87	Q	140		46.70%	out	J IN BOTH	20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',5,5',6-Hexachlorobiphenyl (165)	0.99	U	1.3	J Q	27.07%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	500		590		16.51%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.3	U	1.7	U	26.67%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	1000		1200		18.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (171/173)	300	C	340	C	12.50%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	190		220		14.63%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	49		60		20.18%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	20	J	24		18.18%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	5.1	J	5.5	J	7.55%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	280		310		10.17%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	56		62		10.17%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	14	J	16	J	13.33%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (180/193)	1700	C	2000	C	16.22%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	27		30		10.53%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	4.7	J	4.9	J Q	4.17%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	450		550		20.00%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	0.99	U	1.6	J	47.10%	out	NQ	20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	39		1.9	U	#######	out	NQ-FS @ LOQ	39
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	0.99	U	0.94	U	-5.18%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	730		850		15.19%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	4.5	J	5.1	J	12.50%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	35	B	43	B	20.51%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	8.7	J	190		182.49%	out	NQ - NOTE	20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	43		50		15.05%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	0.99	U	0.96	U	-3.08%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	150		200		28.57%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	65		73		11.59%	in		2.0
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	75		83		10.13%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	7.6	J	8.1	J	6.37%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (198/199)	230	C	250	C	8.33%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	1.4	J	2.4	J Q	52.63%	out	NQ	20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	24		26		8.00%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	37		44		17.28%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	160		180		11.76%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	0.99	U	0.94	U	-5.18%	in		39
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	6.3	J	7.5	J	17.39%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	61		71		15.15%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	10	J	11	J	9.52%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	24		29		18.87%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Decachlorobiphenyl (209)	21		23		9.09%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Total Monochlorobiphenyls	4.1		4.7		13.64%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Total Dichlorobiphenyls	57		70		20.47%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Total Trichlorobiphenyls	570		650		13.11%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Total Tetrachlorobiphenyls	7200		7700		6.71%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Total Pentachlorobiphenyls	25000		29000		14.81%	in		20
VWW06-FS01-0112	VWW06-FS01P-0112	Total Hexachlorobiphenyls	21000		24000		13.33%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	Total Heptachlorobiphenyls	5000		6000		18.18%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	Total Octachlorobiphenyls	760		870		13.50%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	Total Nonachlorobiphenyls	96		110		13.59%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	Toxic Equivalents (Total TEQ)	2.68		2.4		-11.02%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',5,5'-Tetrachlorobiphenyl (52)	1900	B	2100	B	10.00%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	2,2',4,4',5-Pentachlorobiphenyl (99)	3800		4300		12.35%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	2,3,3',4,4'-Pentachlorobiphenyl (105)	2500	B	2800	B	11.32%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	2,3',4,4',5-Pentachlorobiphenyl (118)	8200	B	9300	B	12.57%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (138/163/129)	9100	C	11000	C	18.91%	in		
VWW06-FS01-0112	VWW06-FS01P-0112	Congeners (153/168)	7400	C	8800	C	17.28%	in		

Sample_Name	Duplicate_ID	Chem_Name	Analyte_Value	Lab Flag	Dup Analyte_Value	Lab Flag	RPD	RPD IN/OUT	ACTION	LOQ
VWW06-CRB01-0112	VWW06-CRB01P-0112	2-Chlorobiphenyl (1)	2.7	J Q	3.1	J	13.79%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3-Chlorobiphenyl (2)	3.5	J	4.1	J	15.79%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	4-Chlorobiphenyl (3)	1.1	J Q	1.2	J Q	8.70%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2'-Dichlorobiphenyl (4)	9.9	J Q	8.7	J Q	-12.90%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3-Dichlorobiphenyl (5)	9.8	U	9.9	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3'-Dichlorobiphenyl (6)	9.8	U	11	J	11.54%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,4-Dichlorobiphenyl (7)	9.8	U	9.9	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,4'-Dichlorobiphenyl (8)	37		39		5.26%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,5-Dichlorobiphenyl (9)	9.8	U	9.9	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,6-Dichlorobiphenyl (10)	9.8	U	9.9	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3'-Dichlorobiphenyl (11)	71		72		1.40%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (13/12)	20	U	20	U C J Q	0.00%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,5-Dichlorobiphenyl (14)	9.8	U	9.9	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	4,4'-Dichlorobiphenyl (15)	10	J Q	9.1	J Q	-9.42%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3-Trichlorobiphenyl (16)	10	J	11	J	9.52%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',4-Trichlorobiphenyl (17)	28	B	32	B	13.33%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (30/18)	62	C B	64	C B	3.17%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',6-Trichlorobiphenyl (19)	11	J	11	J	0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (28/20)	320	C B	350	C B	8.96%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (21/33)	93	C B	100	C B	7.25%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,4'-Trichlorobiphenyl (22)	58	B	63	B	8.26%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,5-Trichlorobiphenyl (23)	3.3	J Q	0.99	U	-107.69%	out	NQ	20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,6-Trichlorobiphenyl (24)	0.98	U	0.99	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4-Trichlorobiphenyl (25)	23		26		12.24%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (26/29)	48	C	54	C	11.76%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',6-Trichlorobiphenyl (27)	6.7	J	7.5	J	11.27%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,4',5-Trichlorobiphenyl (31)	220	B	250	B	12.77%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,4',6-Trichlorobiphenyl (32)	71		76		6.80%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',5'-Trichlorobiphenyl (34)	0.98	U	3.6	J	114.41%	out	NQ	20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',4-Trichlorobiphenyl (35)	2.0	U J Q	2.0	U J Q	0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',5-Trichlorobiphenyl (36)	20		26		26.09%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,4,4'-Trichlorobiphenyl (37)	33		36		8.70%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,4,5-Trichlorobiphenyl (38)	0.98	U	0.99	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,4',5-Trichlorobiphenyl (39)	0.98	U	1.6	J	48.06%	out	NQ	20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (40/71)	200	C	210	C	4.88%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4-Tetrachlorobiphenyl (41)	0.98	U	0.99	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4'-Tetrachlorobiphenyl (42)	78		79		1.27%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,5-Tetrachlorobiphenyl (43)	10	J	13	J	26.09%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (44/47/65)	940	C B	980	C B	4.17%	in		59
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,6-Tetrachlorobiphenyl (45)	26		22		-16.67%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,6'-Tetrachlorobiphenyl (46)	10	J	10	J	0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',4,5-Tetrachlorobiphenyl (48)	43		44		2.30%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (69/49)	870	C	910	C	4.49%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (50/53)	110	C B	110	C B	0.00%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',4,6'-Tetrachlorobiphenyl (51)	40		41		2.47%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',6,6'-Tetrachlorobiphenyl (54)	2.0	J	2.2	J	9.52%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4-Tetrachlorobiphenyl (55)	2.0	U	2.0	U	0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4'-Tetrachlorobiphenyl (56)	280		300		6.90%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',5-Tetrachlorobiphenyl (57)	78		0.99	U	-194.99%	out	NQ-NOTE	20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',5'-Tetrachlorobiphenyl (58)	1.1	U	0.99	U	-10.53%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (59/62/75)	63	C	64	C	1.57%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,4,4'-Tetrachlorobiphenyl (60)	160		170		6.06%	in		59
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (61/70/74/76)	2600	C B	2800	C B	7.41%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,4',5-Tetrachlorobiphenyl (63)	53		56		5.50%	in		78
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,4',6-Tetrachlorobiphenyl (64)	350	B	360	B	2.82%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4,4'-Tetrachlorobiphenyl (66)	1200	B	1300	B	8.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4,5-Tetrachlorobiphenyl (67)	29		32		9.84%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4,5'-Tetrachlorobiphenyl (68)	18	J	19	J	5.41%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',5,5'-Tetrachlorobiphenyl (72)	29		24		-18.87%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',5',6-Tetrachlorobiphenyl (73)	0.98	U	0.99	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',4,4'-Tetrachlorobiphenyl (77)	52		53		1.90%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',4,5-Tetrachlorobiphenyl (78)	1.3	U	0.99	U	-27.07%	in		2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',4,5'-Tetrachlorobiphenyl (79)	71		71		0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',5,5'-Tetrachlorobiphenyl (80)	1.0	U	0.99	U	-1.01%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,4,4',5-Tetrachlorobiphenyl (81)	1.1	U	0.99	U	-10.53%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4-Pentachlorobiphenyl (82)	160		170		6.06%	in		2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',5-Pentachlorobiphenyl (83)	1.7	U	1.1	U	-42.86%	out	NQ	20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',6-Pentachlorobiphenyl (84)	530		560		5.50%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (117/116/85)	800	C	860	C	7.23%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (86/87/97/108/119/125)	2500	C	2700	C	7.69%	in		59
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (88/91)	470	C	510	C	8.16%	in		120
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,6'-Pentachlorobiphenyl (89)	14	J	15	J	6.90%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,5,5'-Pentachlorobiphenyl (92)	980		1000		2.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (93/100)	29	C J	30	C J	3.39%	in		59
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,5,6'-Pentachlorobiphenyl (94)	8.8	J	9.1	J	3.35%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,6,6'-Pentachlorobiphenyl (96)	5.8	J	5.7	J	-1.74%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (98/102)	77	C	82	C	6.29%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',4,5',6-Pentachlorobiphenyl (103)	31		33		6.25%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',4,6,6'-Pentachlorobiphenyl (104)	0.98	U	0.57	J Q	-52.90%	out	NQ	20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,4'-Pentachlorobiphenyl (105)	1600	B	1800	B	11.76%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,5-Pentachlorobiphenyl (106)	2.0	U	2.0	U	0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,6-Pentachlorobiphenyl (109)	380		400		5.13%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (107/124)	200	C	220	C	9.52%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',5,5'-Pentachlorobiphenyl (111)	1.2	U	5.4	J	127.27%	out	NQ	2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',5,6-Pentachlorobiphenyl (112)	1.6	U	1.1	U	-37.04%	out	NQ	20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,4,4',5-Pentachlorobiphenyl (114)	120		120		0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4,5,5'-Pentachlorobiphenyl (120)	22		24		8.70%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4,5',6-Pentachlorobiphenyl (121)	1.4	J Q	1.4	J	0.00%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4',5'-Pentachlorobiphenyl (122)	61		58		-5.04%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4,4',5'-Pentachlorobiphenyl (123)	64		71		10.37%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',4,4',5-Pentachlorobiphenyl (126)	13		8.5		-41.86%	out	J IN BOTH	2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',4,5,5'-Pentachlorobiphenyl (127)	7.6	J Q	8.0	J	5.13%	in		2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (128/166)	750	C	840	C	11.32%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (138/163/129)	5200	C B	5600	C B	7.41%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	320		360		11.76%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,6-Hexachlorobiphenyl (131)	19	J Q	20	J	5.13%	in		2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	920		1000		8.33%	in		2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	74		83		11.46%	in		20

VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (134/143)	130	C	120	C	-8.00%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (151/135)	830	C	900	C	8.09%	in		59
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	290		310		6.67%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,4',5-Hexachlorobiphenyl (137)	220		240		8.70%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (139/140)	95	C	100	C	5.13%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	670		690		2.94%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,5,6-Hexachlorobiphenyl (142)	0.98	U	0.99	U	1.02%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,5',6-Hexachlorobiphenyl (144)	120		130		8.00%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	1.1	J Q	0.99	U	-10.53%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	650		710		8.82%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (147/149)	2700	C B	2900	C B	7.14%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	3.6	J	3.6	J	0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	3.7	J	4.0	J	7.79%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	1.9	J	2.1	J Q	10.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	56		58		3.51%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	0.98	U	1.0	J Q	2.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (156/157)	830	C	920	C	10.29%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,4',6-Hexachlorobiphenyl (158)	590		680		14.17%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	6.3	J	8.5	J	29.73%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,5,6-Hexachlorobiphenyl (160)	0.98	U	0.99	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,5',6-Hexachlorobiphenyl (161)	0.98	U	0.99	U	1.02%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	35		40		13.33%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4',5',6-Hexachlorobiphenyl (164)	310		340		9.23%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',5,5',6-Hexachlorobiphenyl (165)	1.2	J Q	0.74	J	-47.42%	out	NQ	3.9
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	280		300		6.90%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.3	U	1.3	J	0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	510		590		14.55%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (171/173)	180	C	210	C	15.38%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	100		120		18.18%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	360		410		12.99%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	15	J	17	J	12.50%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	25		28		11.32%	in		2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	300		340		12.50%	in		2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	82		94		13.64%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	100		110		9.52%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (180/193)	960	C	1100	C	13.59%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	13	J	15	J	14.29%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	5.2	J	5.1	J	-1.94%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	230		260		12.24%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	1.2	J	0.94	J Q	-24.30%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	31		48		43.04%	out	J IN BOTH	20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	0.98	U	0.99	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	540		620		13.79%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	3.1	J	3.0	J	-3.28%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	19		20		5.13%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	79		82		3.73%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	24		25		4.08%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	0.98	U	0.99	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	79		86		8.48%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	31		34		9.23%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	48		56		15.38%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	5.6	J	4.8	J Q	-15.38%	in		2.0
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (198/199)	160	C	180	C	11.76%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	7.2	J	7.2	J Q	0.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	17	J	20	J	16.22%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	36		38		5.41%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	75		83		10.13%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	0.98	U	0.99	U	1.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	2.8	J Q	3.7	J	27.69%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	33		39		16.67%	in		39
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	5.8	J	7.0	J	18.75%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	18	J	19	J	5.41%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Decachlorobiphenyl (209)	13	J	15	J	14.29%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Monochlorobiphenyls	7.4		8.5		13.84%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Dichlorobiphenyls	130		150		14.29%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Trichlorobiphenyls	1000		1100		9.52%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Tetrachlorobiphenyls	9800		10000		2.02%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Pentachlorobiphenyls	31000		34000		9.23%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Hexachlorobiphenyls	19000		21000		10.00%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Heptachlorobiphenyls	3600		4100		12.99%	in		20
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Octachlorobiphenyls	460		510		10.31%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	Total Nonachlorobiphenyls	57		65		13.11%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	Toxic Equivalents (Total TEQ)	1.39		1.16		-18.04%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',5,5'-Tetrachlorobiphenyl (52)	2400	B	2700	B	11.76%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (113/90/101)	5900	C B	6600	C B	11.20%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',3,5',6-Pentachlorobiphenyl (95)	2500	B	2900	B	14.81%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,2',4,4',5-Pentachlorobiphenyl (99)	3100		3500		12.12%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (110/115)	6100	C B	6700	C B	9.38%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	2,3',4,4',5-Pentachlorobiphenyl (118)	5600	B	6400	B	13.33%	in		
VWW06-CRB01-0112	VWW06-CRB01P-0112	Congeners (153/168)	4100	C	4600	C		NA		

ADDITONAL VALIDATION NOTES

Initial/Continuing Calibrations

There were no qualifications required for the PCB samples based on unmet calibration criteria. However, it should be noted that the laboratory data package was missing both signal-to-noise ratio summaries and RRT summaries. A resubmission request was made for these summaries but the laboratory is unable to produce summary forms for these QC criteria at this time. Therefore, the validator requested examples of how these checks were accomplished in the laboratory and a letter stating that these criteria were met. Both of these things were received.

Blank Contamination

Blank contamination flagging criteria was modified to fit more in line with the flagging recommendations from the NFG as this criterion fits the DOD requirements of the DL/LOD/LOQ reporting scheme better. For this project non-detect results were reported to the compound LOD. For this reason a 5 times the blank contamination rule was not used to flag the samples. Criteria used to flag the samples were as follows:

U at LOD	The sample result for the blank contaminant is less than the LOD but greater than the DL when the blank value is less than or greater than the LOD. The sample result for the blank contaminant is qualified as non-detect U at the LOD.
U	The sample result for the blank contaminant is greater than the LOD but less than the blank value. The sample result for the blank contaminant is qualified as non-detect U.
J	The sample result for the blank contaminant is greater than the LOD and greater than the blank contamination concentration but less than the 10X the blank contamination concentration when the blank value is greater than the LOD. The sample result for the blank contaminant is qualified as estimated J.

The final criteria in the set is a professional judgment decision based on the fact that positive results for contaminant compounds may be biased high for blank contamination that is above the compound LODs. Results that are greater than 10X the blank concentration are likely unaffected to a great degree by the contamination. Homogenization blanks were assessed for impact to the field samples. There was no impact based on homogenization blank contamination. Differences in matrix and extraction procedure were taken in to consideration when criterion was applied.

Associated blanks exhibited contamination as noted in the following table. *Please note that only those compounds resulting in qualifications were noted in the following table. Also, the blank qualification code takes precedence over other qualification codes. So congeners flagged for other QC issues as well as blank contamination will have a MBL qualifier code as the final qualifier code.*

Blank ID	Compound	Concentration (pg/g)	Action Level
G2B140000-127B	PCB-18/30	1.4 CJQ	LOD with action as follows: *U at LOD if < LOD *U at value if >LOD but <blank conc. *J up to 10X conc. if >LOD and >blank conc.
	PCB 20/28	2.9 CJ (>LOD)	
	PCB 31	2.8 JQ (>LOD)	
	PCB 32	0.61 JQ	
	PCB 44/47/65	9.6 CJ (>LOD)	
	PCB 49/69	0.92 CJQ	
	PCB 52	3.3 J (>LOD)	
	PCB 61/70/74/76	3.7 CJ	
	PCB 95	3.1 J (>LOD)	
	PCB 110/115	2.9 CJ (>LOD)	
G2B160000-107B	PCB 17	1.1 J (>LOD)	
	PCB 18/30	2.2 CJQ (>LOD)	
	PCB 20/28	4.8 JQ (>LOD)	
	PCB 22	1.7 JQ (>LOD)	
	PCB 31	4.8 J (>LOD)	
	PCB 44/47/65	12 CJ (>LOD)	
	PCB 52	4.5 JQ (>LOD)	
	PCB 61/70/74/76	4.5 CJ (>LOD)	
	PCB 64	1.5 J (>LOD)	
	PCB 66	1.5 JQ (>LOD)	
	PCB 95	1.6 JQ (>LOD)	

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Q Code
VWW06-CRB05P-0212	PCB 17	U at LOD	MBL
VWW06-CRB03-0112, VWW06-CRB04-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 17	J	MBL
VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212	PCB 18/30	U at LOD	MBL
VWW06-CRB03-0112, VWW06-CRB04-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 18/30	J	MBL
VWW06-FS06-0112 DL, VWW06-CRB06-0112	PCB 20/28	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB08-0112	PCB 20/28	J	MBL
VWW06-CRB05P-0212	PCB 22	U at LOD	MBL
VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 22	J	MBL
VWW06-FS06-0112 DL	PCB 31	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112, VWW06-CRB07-0112, VWW06-CRB08-0112	PCB 31	J	MBL
VWW06-FS07-0112	PCB 32	U at LOD	MBL
VWW06-FS06-0112 DL	PCB 44/47/65	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS07-0112, VWW06-FS08-0212, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB08-0112	PCB 44/47/65	J	MBL
VWW06-FS06-0112 DL	PCB 49/69	U at LOD	MBL
VWW06-FS05-0212, VWW06-FS05P-0212, VWW06-FS06-0112 DL, VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 52	J	MBL
VWW06-FS06-0112 DL	PCB 61/70/74/76	U at LOD	MBL

Sample ID	Compound	Q Flag	Q Code
VWW06-CRB05-0212, VWW06-CRB05P-0212	PCB 61/70/74/76	J	MBL
VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 64	J	MBL
VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112	PCB 66	J	MBL
VWW06-FS05-0112, VWW06-FS05P-0112, VWW06-FS06-0112 DL , VWW06-CRB05-0212, VWW06-CRB05P-0212, VWW06-CRB06-0112, VWW06-CRB08-0112	PCB 95	J	MBL
VWW06-FS06-0112 DL	PCB 110/115	J	MBL

Field Duplicates

Four field duplicate pairs were submitted by the client. These pairs were assessed for reproducibility. A RPD criteria of 30% was applied to results that were >LOQ in both the field sample and the field duplicate. A table of results and calculated RPDs is included in the validation worksheets. Qualifications were required.

Co-eluting Isomers

The laboratory flagged all positive results for co-eluting isomers with a C flag to indicate that the result is for co-eluting isomers. Since this is implicit in the congener parameter name the C flags were removed from the results with no additional qualifier required.

Dilutions

Several samples required dilution. For the majority of the analyses, congeners were reported from either the undiluted run or the diluted run, therefore no additional comment was required.

For sample VWW06-FS03-0212, the laboratory analyzed an undiluted run, a 50X dilution and a complex dilution. The laboratory reported the 50X dilution and the complex dilution analysis. The 50X dilution exhibited one result above the calibration range and many high concentrations of other congeners as well as some issues with the ion abundance ratios in the recovery standards. Therefore, all results from the 50X dilution of this sample are excluded in favor of the results reported from the complex dilution analysis in an effort to minimize possible interferences.

For sample VWW06-FS06-0112, the laboratory analyzed an undiluted run and then a 5X dilution run, in an effort to minimize interferences evidenced by high internal standard recoveries in the undiluted run. All recoveries were acceptable in the 5X dilution run, therefore the undiluted analysis of this sample is excluded in favor of the results reported from the 5X dilution run.

Additional notes

One congener was flagged with a G flag to indicate that the detection limits were raised based on interferences noted in the chromatography. This G flag was crossed out by the validator and no additional qualification was required because the detection limit was raised as necessary.

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Thursday, May 03, 2012 4:17 PM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com; John.Swenfurth@CH2M.com; DataQual
Subject: RE: Vieques Missing CCV
Attachments: 20FE1212D8_1.pdf; 21FE1212D8_71.pdf

Jackie,
Attached are the missing CCVs. Please let me know if you need anything further. We're recompiling this data package with all missing data and will reissue a final CD. I apologize for these issues.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Wednesday, May 02, 2012 3:00 PM
To: Sellers, Karen
Cc: Michael.Zamboni@CH2M.com; John.Swenfurth@CH2M.com; 'DataQual'
Subject: RE: Vieques Missing CCV
Importance: High

Hi Karen,

Also, the CCV you emailed to me today is not the one that I need. The one I need is the one associated with samples -1, -2, & -3 on analysis day 2/20. The file ID of the standard need is 20FE212D8_1. Please send this one over with the one I asked for a few minutes ago! Thanks!

Jackie

From: Sellers, Karen [mailto:Karen.Sellers@testamericainc.com]
Sent: Wednesday, May 02, 2012 11:46 AM
To: Jacqueline Cleveland
Subject: Vieques Missing CCV

Hi Jackie,
Attached is the missing CCV you needed.

KAREN SELLERS
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

880 Riverside Parkway
West Sacramento, CA 95605
Tel 916.374.4442 I Fax 916.372.1059
www.testamericainc.com

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Wednesday, May 02, 2012 11:46 AM
To: Jacqueline Cleveland
Subject: Vieques Missing CCV
Attachments: CCV_2_20.pdf

Hi Jackie,
Attached is the missing CCV you needed.

KAREN SELLERS
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

880 Riverside Parkway
West Sacramento, CA 95605
Tel 916.374.4442 I Fax 916.372.1059
www.testamericainc.com

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: *Project Feedback*

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Tuesday, May 01, 2012 7:07 PM
To: Jacqueline Cleveland
Subject: RE: Vieques Missing Data

Jackie,
This missing CCV was not included in the earlier revisions. I'll need the lab to go back and retrieve this data and e-mail it to you tomorrow.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, May 01, 2012 3:16 PM
To: Sellers, Karen
Subject: RE: Vieques Missing Data
Importance: High

I don't have an ftp site so just fed-ex it over to me, no signature required – it can be left at the door. Did you get my voice mail about the missing standards for the run date 2/20 as well??

Jackie

From: Sellers, Karen [mailto:Karen.Sellers@testamericainc.com]
Sent: Tuesday, May 01, 2012 4:57 PM
To: Jacqueline Cleveland
Subject: Vieques Missing Data

Hi Jackie,
I have the missing pages in hand and will get them out via Fed-Ex overnight to you. It's about 600 pages of data so it's a bit too large to e-mail. If you have an ftp site I can upload these to, let me know. I

KAREN SELLERS
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

880 Riverside Parkway
West Sacramento, CA 95605
Tel 916.374.4442 I Fax 916.372.1059
www.testamericainc.com

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: *Project Feedback*

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Friday, April 27, 2012 6:14 PM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com
Subject: RE: Remaining Info for Vieques validation
Attachments: Cover Letter.pdf; Signal_to_noise_Guide.pdf; RRT_Guide.pdf

Jackie,
Attached are the additional calculations and letter you requested. The RRT guide is a screen shot so it's best viewed magnified to see clearly. It is a table. Each line has the compound, its RT, Relative RRT and the compound it is relative to. Please let me know if you have any further questions or need anything else.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Wednesday, April 25, 2012 2:48 PM
To: Sellers, Karen
Cc: Michael.Zamboni@CH2M.com
Subject: RE: Remaining Info for Vieques validation

Hi Karen,

Thank you for getting back to me today. I will wait for his information as it is important in the validation of the data package. I do appreciate the fact that the things I need require some time to put together. I hope you have a good evening!

Jackie

From: Sellers, Karen [mailto:Karen.Sellers@testamericainc.com]
Sent: Wednesday, April 25, 2012 4:33 PM
To: Jacqueline Cleveland
Subject: Remaining Info for Vieques validation

Jackie,
I received your voicemail today and thank you for the details pertaining to what you still need from us. I forwarded this to our QA manger, Doug Weir. He acknowledges that he sent you some guidance for determining response factor but still needs to get you the relative retention time and signal to noise information. He will be able to get this to you on Friday. I know you want/need to finish this up but he's asking that you give him a few more days as he's in a meeting all day tomorrow and will need to work on this today and Friday.

If this isn't acceptable, please let me know.
Thanks again for your patience.

KAREN SELLERS
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

880 Riverside Parkway
West Sacramento, CA 95605
Tel 916.374.4442 I Fax 916.372.1059
www.testamericainc.com

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: *Project Feedback*

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Wednesday, April 25, 2012 1:49 PM
To: Jacqueline Cleveland
Subject: RE: Calculations for Vieques

Jackie,
Per Doug, he's provided everything you requested in terms of the calculations and I think we addressed all the other issues. If not can you please let me know what's still outstanding?
Thanks,

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Monday, April 23, 2012 3:23 PM
To: Sellers, Karen
Cc: Michael.Zamboni@CH2M.com; 'DataQual'
Subject: RE: Calculations for Vieques

Hi Karen,

Just checking in on the status of the last pieces of the validation resubmission request...do you have an estimate on when I will receive those bits?

Jackie

From: Sellers, Karen [mailto:Karen.Sellers@testamericainc.com]
Sent: Thursday, April 19, 2012 6:04 PM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com
Subject: FW: Calculations for Vieques

Jackie,
Attached are the calculations. Doug states that you should use these rather than the ones I sent to you yesterday as he discovered an error in the ones I directed to you yesterday.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Wednesday, April 25, 2012 4:33 PM
To: Jacqueline Cleveland
Subject: Remaining Info for Vieques validation

Jackie,
I received your voicemail today and thank you for the details pertaining to what you still need from us. I forwarded this to our QA manger, Doug Weir. He acknowledges that he sent you some guidance for determining response factor but still needs to get you the relative retention time and signal to noise information. He will be able to get this to you on Friday. I know you want/need to finish this up but he's asking that you give him a few more days as he's in a meeting all day tomorrow and will need to work on this today and Friday.

If this isn't acceptable, please let me know.
Thanks again for your patience.

KAREN SELLERS
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

880 Riverside Parkway
West Sacramento, CA 95605
Tel 916.374.4442 I Fax 916.372.1059
www.testamericainc.com

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: *Project Feedback*

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Thursday, April 19, 2012 6:04 PM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com
Subject: FW: Calculations for Vieques
Attachments: G2B080439_calc2.pdf; 209congener_RRF.pdf

Jackie,
Attached are the calculations. Doug states that you should use these rather than the ones I sent to you yesterday as he discovered an error in the ones I directed to you yesterday.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Thursday, April 19, 2012 11:44 AM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com
Subject: RE: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator

Thanks Jackie. I'll discuss with our QA manger and see what he can provide. I still need to get you the other calculations as well. I haven't forgotten about that either.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, April 19, 2012 5:24 AM
To: Sellers, Karen
Cc: Michael.Zamboni@CH2M.com
Subject: RE: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator

Hi Karen,

Thanks so much for you willingness to help me with this. The request for a statement isn't really in addition to, more like in place of, the S/N ratios and RRT information. I think it will suffice as long as I am able to see how the checks were made. Also, an alternative to a call, if that is inconvenient, would be to mark up raw data pages and provide an example of how your system assesses the S/N ratios and RRTs for the continuing calibration checks. I will be available for a call anytime after 1pm CST. Again I do appreciate your help.

Jackie

From: Sellers, Karen [mailto:Karen.Sellers@testamericainc.com]
Sent: Wednesday, April 18, 2012 4:57 PM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com
Subject: RE: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator

Hi Jackie,
I received both your recent messages. Yes we can certainly set up a phone call to connect you with someone in our QA department to walk you through the data package a bit. I'll see if the time frame you propose below will work for them.

I'll also pass this additional request over to our QA manager as well - a statement from the lab (your PCB lab supervisor/manager) that says that the method criteria were met for the S/N ratios and the RRTs for the VER CS-3 standards should suffice.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Wednesday, April 18, 2012 11:57 AM
To: Sellers, Karen
Cc: dataqual@charter.net; Michael.Zamboni@CH2M.com; Hillary.Ott@CH2M.com
Subject: FW: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator
Importance: High

Hi Karen,

I hope you are having a good day!

I wanted to touch base with you regarding my request for further information for the PCB package noted above. I was discussing this with Mike Z at CH2M. As these are method QC criteria (items #3 & #5) I am sure you are performing these checks. Since you are unable to provide summary forms for them, I wondered if perhaps you could give me some specific instructions on how to locate the information I need in the data package. That way I can do some random checks/calculations to verify the S/N ratios and RRTs. That, coupled with a statement from the lab (your PCB lab supervisor/manager) that says that the method criteria were met for the S/N ratios and the RRTs for the VER CS-3 standards should suffice. So if I do a couple of random verifications and get a statement from you that criteria were met then that would satisfy those 2 requests.

I am assuming that you are still pulling the response for items #1 & #4. I appreciate your efforts to help me provide validation for this SDG to Mike. If possible, please provide me with an approximate time frame within which I can expect the outstanding items. If we need to arrange a phone call to help to guide me through the data package just let me know. I will be available to talk with someone all afternoon tomorrow (Thursday from about 1pm CST to about 10pm CST. Thanks so much!

Jackie

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Monday, April 16, 2012 2:53 PM
To: 'Sellers, Karen'
Cc: 'Michael.Zamboni@CH2M.com'; 'DataQual'
Subject: FW: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator
Importance: High

Hi Karen,

I'm just checking on status for the items noted below. I hope you are having a good day!

Jackie

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, April 12, 2012 2:28 PM
To: 'Sellers, Karen'
Cc: 'Michael.Zamboni@CH2M.com'; 'Hillary.Ott@CH2M.com'; 'DataQual Environmental Services, LLC'
Subject: RE: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator

Karen,

Thank you for all of the information so far. I appreciate your work to help me understand your data package.

Unfortunately I really need the information requested in #3 & in #5. These are validation criteria upon which the data could be qualified. Since the method has criteria for S/N ratios and RRTs how do you determine that criteria has been met if these things aren't summarized or easily observed? I have to be able to verify that these criteria are met in some way.

I am also looking forward to your calculation examples (#1) and descriptor switching resolution summaries (#4).

I realize that many of these things are obvious to your analysts but they are not to me. I appreciate any additional help you can provide!

Jackie

From: Sellers, Karen [mailto:Karen.Sellers@testamericainc.com]
Sent: Wednesday, April 11, 2012 7:58 PM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com; Hillary.Ott@CH2M.com; DataQual Environmental Services, LLC
Subject: FW: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator

Hi Jackie,

Below is the response to 2 of the items you requested further information for. Although we provided a full CLP-like data package for this project as requested in the SOW, we are not currently able to produce certain summary forms such as those requested in items # 3 & # 5. By the end of the summer we should be able to provide forms such as this since we'll be on a new LIMs. If you need us to "walk you through" the raw data at all, please let me know.

We're working on putting together a summary of the calculations to satisfy #1 and should have this to you by tomorrow. Our QA department is also working on a response to item #4. I hope this helps in allowing you to proceed with your validation.

2. I am unable to locate the WDM standards. I actually think that you are using the mid-level in the ICAL and the continuing cal standards for this purpose. However Region II has specific criteria for validation, including the labeling of the WDM congeners in each Quant report. I need the standards resubmitted with these labeled.

<Response> TestAmerica West Sacramento does use the mid-level of the initial calibration and the continuing calibration standards to fulfill the purpose of the window defining mix. The quantitation reports are set up to display each congener group by order of increasing substitution, and within each congener group, the congeners are in elution order. The naming convention is to use the congener type, followed by the PCB number. Therefore, PCB-1, which is mono-substituted, is named as MoCB-1. In the attached annotated pages from the report, the first and last congeners from the di-substituted congeners are pointed out, as well as the fact that the formatting includes a space between congener groups to facilitate finding the information. Because the delineations are inherent in the report, we don't believe further labelling is required.

6. Several samples were reanalyzed at dilutions (8 & 13) that were not noted in the narrative. Samples 14 & 15 were noted in narrative as being diluted prior to analysis, but then a further dilution of both samples was performed. I am assuming these dilutions (8 & 13) and additional dilutions (14 & 15) were due to congeners that were above the calibration range. Please confirm this.

<Response> As noted on page 5 of the report, sample 8 required further dilution due to matrix interferences affecting internal standard recoveries. The additional dilutions of samples 13, 14, and 15 were a result of congeners above the calibration range.

<<Example from G2B080439.pdf>> <<PCB Eq.doc>>

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Wednesday, April 18, 2012 1:46 PM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com
Subject: FW: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator
Attachments: RunList.xls; G2B080439_calc.pdf

Jackie,
Thank you for your patience.

The outstanding items are:
Item 1: Example Calculations: The validator is going based on the Region II validation guideline, which looks for example calculations for virtually every calculated item (ion ratios, RRFs for coeluting congeners, sample concentrations). For normal CLP work, the lab provides equations in the case narrative, and an example calculation on an LCS. For this lot, the operations group did neither, as they were not aware of the need. I would recommend following our normal practice, however, it may not suit the validator.

Item 4: Congener Descriptor Resolution Summaries: Much of the data on this summary form is available on the run log and on the CCV report. **It does not include a summary of the dates/times of analysis for each injection associated with that standard.**

Attached is a summary of the dates/times of analysis as a reply to item #4. We've got several of the calculations (ion ratio and native concentration calculation) outlined and they're also attached. Doug, our QA manager is still working on outlining several other calculations that he hopes to have completed by the end of the day.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Friday, April 13, 2012 5:50 PM
To: Jacqueline Cleveland
Subject: RE: CH2M HILL Vieques SWMU6 Request
Attachments: 20120413155054532.pdf

Hi Jackie,
Attached are the missing raw data pages. They don't include the quantitation reports/peaks for manual integration. Please let me know if you have any questions or need anything further in relation to this request.

KAREN SELLERS
Project Manager
Tel 916.374.4442 I Fax 916.372.1059

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, April 12, 2012 2:30 PM
To: Sellers, Karen
Cc: 'DataQual'; Michael.Zamboni@CH2M.com; Hillary.Ott@CH2M.com
Subject: CH2M HILL Vieques SWMU6 Request

Karen,

Hello. I hope you are having a good day! It looks to me like I am missing a portion of the chromatograms for one of the CS standards. For CS3 – ID ST0216A; 2/17/12 at 00:16:11 (begins on p. 2128 of the data package) the submitted chromatograms stop with the manual integration for DICB-8 on p. 2146. The next page begins another calibration verification standard. If I am correct in my assessment will you send me the missing pages? Thanks!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

Jacqueline Cleveland

From: Sellers, Karen [Karen.Sellers@testamericainc.com]
Sent: Wednesday, April 11, 2012 7:58 PM
To: Jacqueline Cleveland
Cc: Michael.Zamboni@CH2M.com; Hillary.Ott@CH2M.com; DataQual Environmental Services, LLC
Subject: FW: CH2M Hill Vieques SWMU 6 PCBs (1668A) -- Some information for the validator
Attachments: Example from G2B080439.pdf; PCB Eq.doc

Hi Jackie,

Below is the response to 2 of the items you requested further information for. Although we provided a full CLP-like data package for this project as requested in the SOW, we are not currently able to produce certain summary forms such as those requested in items # 3 & # 5. By the end of the summer we should be able to provide forms such as this since we'll be on a new LIMs. If you need us to "walk you through" the raw data at all, please let me know.

We're working on putting together a summary of the calculations to satisfy #1 and should have this to you by tomorrow. Our QA department is also working on a response to item #4. I hope this helps in allowing you to proceed with your validation.

2. I am unable to locate the WDM standards. I actually think that you are using the mid-level in the ICAL and the continuing cal standards for this purpose. However Region II has specific criteria for validation, including the labeling of the WDM congeners in each Quant report. I need the standards resubmitted with these labeled.

<Response> TestAmerica West Sacramento does use the mid-level of the initial calibration and the continuing calibration standards to fulfill the purpose of the window defining mix. The quantitation reports are set up to display each congener group by order of increasing substitution, and within each congener group, the congeners are in elution order. The naming convention is to use the congener type, followed by the PCB number. Therefore, PCB-1, which is mono-substituted, is named as MoCB-1. In the attached annotated pages from the report, the first and last congeners from the di-substituted congeners are pointed out, as well as the fact that the formatting includes a space between congener groups to facilitate finding the information. Because the delineations are inherent in the report, we don't believe further labelling is required.

6. Several samples were reanalyzed at dilutions (8 & 13) that were not noted in the narrative. Samples 14 & 15 were noted in narrative as being diluted prior to analysis, but then a further dilution of both samples was performed. I am assuming these dilutions (8 & 13) and additional dilutions (14 & 15) were due to congeners that were above the calibration range. Please confirm this.

<Response> As noted on page 5 of the report, sample 8 required further dilution due to matrix interferences affecting internal standard recoveries. The additional dilutions of samples 13, 14, and 15 were a result of congeners above the calibration range.

<<Example from G2B080439.pdf>> <<PCB Eq.doc>>

KAREN SELLERS

Project Manager

Tel 916.374.4442 I Fax 916.372.1059

From: Jacqueline Cleveland [mailto:cleve137@charter.net]

Sent: Sunday, April 08, 2012 3:01 PM

initial request

To: Sellers, Karen

Cc: Michael.Zamboni@CH2M.com; 'DataQual'; Hillary.Ott@CH2M.com

Subject: CH2M Hill Vieques SWMU 6 PCBs (1668A)

Importance: High

Hello,

I am validating the data for CH2M Hill for Vieques SWMU 6. The TA West Sac Project Number is G2B080439. I have several questions/requests for you. I have itemized the things I need information on below. These data are being validated based on Region II validation SOP criteria. I have attached this SOP as it may help you to see what I require in my review.

1. Please provide at least one calculation example each for ion abundance ratios, RRFs for co-eluting congeners, and sample concentrations.

2. I am unable to locate the WDM standards. I actually think that you are using the mid-level in the ICAL and the continuing cal standards for this purpose. However Region II has specific criteria for validation, including the labeling of the WDM congeners in each Quant report. I need the standards resubmitted with these labeled.

3. Please provide signal/noise ratio summaries for all injections.

4. Please provide the congener descriptor switching resolution summaries.

5. Please provide RRTs for the VER CS-3 standards.

6. Several samples were reanalyzed at dilutions (8 & 13) that were not noted in the narrative. Samples 14 & 15 were noted in narrative as being diluted prior to analysis, but then a further dilution of both samples was performed. I am assuming these dilutions (8 & 13) and additional dilutions (14 & 15) were due to congeners that were above the calibration range. Please confirm this.

It is very possible that some of what I am asking about is present in the data package but I am not recognizing it. Please don't hesitate to point me in the right direction. I am looking for summary forms and/or clearly labeled information so it is possible I am missing it! Also, if you would, please be as specific and detailed as possible in your responses as this data is on a very tight turn-around time. Thanks so much for your help!

Jackie

Jacqueline Cleveland

Vice-President

DataQual, ES, LLC

636-352-9391

cleve137@charter.net

<< File: SOP HWSS-46.pdf >>

Jacqueline Cleveland

From: Michael.Zamboni@CH2M.com
Sent: Tuesday, April 10, 2012 9:05 AM
To: cleve137@charter.net
Cc: dataqual@charter.net; Hillary.Ott@CH2M.com; Michael.Zamboni@CH2M.com
Subject: RE: SWMU 6 Questions

Hi Jackie,

Thanks so much for your efforts so far! I saw all the questions you put in to the laboratory. Hopefully they will respond in a timely manner. Their questions look harder than the ones you posed to me.

1. You don't have to apply qualifiers to both forms. For the second set you mention (results, flags, DLs, TEF factor, and TEQ concentration), please make sure these are in the section of the report titled "TEQ Sheets". They are for the laboratory to calculate the Total TEQ and you don't have to apply qualifiers to that. The first set follows the executive summary (Detection highlights?) and then a page called "method/analyst summary". In my .pdf file I'm looking at .pdf page 164 of 3666. After percent lipids Forms, those forms contain results, flags, DL, LOQ, and units. I'm pretty sure that's the first set you're referring to and those are the ones you should apply flags to.
2. The SAP was written using the preservation requirements for soil. When it came time to actually doing the work, the field people wanted to use dry ice (the labs prefer this too) to control nuisance odor, etc. while the samples and analysis should not be affected. We determined that such preservation would be "above and beyond that required by the UFP-SAP" even though it states "but not frozen". My understanding is that dry ice is typically used for tissue preservation and that this has no adverse effect on the data. The only exceedance is that which is specified in the UFP-SAP (borrowed from soil). If it were me, I wouldn't qualify for that reason, since it was done intentionally (i.e. we would have written the UFP-SAP to include dry ice if we thought it would have been done that way at the time).

Thanks,
Mike Z.

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Sunday, April 08, 2012 6:04 PM
To: Zamboni, Michael/WDC
Cc: 'DataQual'; Ott, Hillary/WDC
Subject: SWMU 6 Questions

Hi Michael,

I have a couple of questions for you and several for Test America Sacramento regarding the 1668A PCBs. Questions for you are below and I will send a separate e-mail to TA – I will copy you on that.

1. The results forms consist of almost 400 pages. The first set includes results with flags, DL, LOQs and units. The second set includes results with flags, DLs, TEF factor and TEQ concentrations. My question is: Is it necessary for me to flag both sets of these forms? It seems very redundant to me and I wanted to see if it is acceptable for me to flag only the first set. The set with TEF factors and TEQ concentrations would be included in the DV worksheets section of the report.
2. According to the SAP the samples were to be at ≤6ºC but not frozen, the SOP says dark and <-10ºC as does Region II. Region II offers no qualification guidance because the only established holding time is one year if stored at the proper temp. The samples were received on dry ice at temperatures between 0 and -9ºC. It is my opinion that this is perfectly fine – but it is not in agreement with the SAP – so I

would like you opinion. I am not inclined to qualify the data because these temps are below freezing which is what I would expect for tissue.

I have several requests for the laboratory. I will be asking them to respond in as much detail as possible so as to minimize the amount of time a "back and forth" conversation could take. However, I also wanted to let you know that I didn't work today (Easter Sunday) except to write these emails. I hope you didn't work either!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

April 27, 2012

Jacqueline Cleveland
DataQual Environmental Services
5830 Amberway Drive
St. Louis, MO 63128

To whom it may concern,

For the data included in TestAmerica Lot G2B080439 all method requirements have been met with respect to signal to noise (S/N) requirements and Relative Retention Times (RRT). This is true for all calibration and calibration checks as well as any positive analytes reported.

Sincerely,

Douglas Weir
Quality Assurance Manager
TestAmerica, West Sacramento

For S/N Review

302

Quantify Compound Report MassLynx 4.1 SCN 714 Desktop

Dataset: P:\12D5\Default.pro\20FE1212D81668A209totalsRPsk2.qld

Last Altered: Wednesday, February 22, 2012 14:07:55 Pacific Standard Time
Printed: Wednesday, February 22, 2012 14:09:59 Pacific Standard Time

Compound Name: DiCB-6, Chrom. Trace: 222.00030

Sample Name: 20FE1212D8_7

20FE1212D8_7 Smooth(SG,1x2)
G2B080439-3 2045127 KSS MQN76-1-AD

F2:Voltage SIR,EI+
222.00030
3.569e+005

S/N = 16/2 = 8:1

signal

Manual Edit Codes

1 Peak not found
2 Poor chromatography
3 Baseline correction
4 Manual EDL calculation
5 Separate near eluters
6 Other

Analyst Date 2/22/12

DiCB-6
14.74
9515.49
94625
28.32

16 mm

2mm

13.37 14.25 14.45 15.65 15.92 17.88 18.37 18.79 19.17

min

20FE1212D8_7 Smooth(SG,1x2)
G2B080439-3 2045127 KSS MQN76-1-AD

F2:Voltage SIR,EI+
223.9974
3.690e+005

noise

S/N = 20/3 = 6.7:1

DiCB-6
14.74
6462.61
70330
12.77

20 mm

3 mm

13.37 13.62 13.91 14.25 14.47 15.05 15.29 15.64 15.99 16.07 16.37 16.77 17.01 17.51 17.94 18.37 18.89 19.15 19.43 20.15 20.53 20.68 20.95

min

13.50 14.00 14.50 15.00 15.50 16.00 16.50 17.00 17.50 18.00 18.50 19.00 19.50 20.00 20.50 21.00

FOR RRT review

Y:\ATG\12D5\JAN2012.PRO\MethDB\1668209EPA12D8_RRT_03122012totalsum.mdb - TargetLynx Method Editor

File Edit Update View Compound Help

	Compound Name	MS Func	MS Trace	IS	Locate Peak Selection	Locate Peak Using	RT (mins)	Predicted RRT	RRT Reference	RT Win (mins)
1	MoCB-1	1	188.03930	188: 13C-MoCB-1	Nearest	Relative Retention Time	8.5943	1.0000	188: 13C-MoCB-1	0.1000
2	MoCB-2	1	188.03930	188: 13C-MoCB-1	Nearest	Relative Retention Time	10.6335	0.9882	189: 13C-MoCB-3	0.1000
3	MoCB-3	1	188.03930	189: 13C-MoCB-3	Nearest	Relative Retention Time	10.8297	1.0010	189: 13C-MoCB-3	0.1000
4	Total MoCB	0	188.03930	None	Totals	Retention Time	10.7643	0.0000	None	0.0000
5		1		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
6	DiCB-4	1	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	11.1173	1.0000	191: 13C-DiCB-4	0.1000
7	DiCB-10	1	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	11.3397	1.0205	191: 13C-DiCB-4	0.1000
8	DiCB-9	2	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	13.4220	1.2028	191: 13C-DiCB-4	0.1000
9	DiCB-7	2	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	13.6042	1.2200	191: 13C-DiCB-4	0.1000
10	DiCB-6	2	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	13.8843	1.2500	191: 13C-DiCB-4	0.1000
11	DiCB-5	2	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	14.2487	1.2792	191: 13C-DiCB-4	0.1000
12	DiCB-8	2	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	14.3687	1.2918	191: 13C-DiCB-4	0.1000
13	DiCB-14	2	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	16.3082	0.9046	192: 13C-DiCB-15	0.1000
14	DiCB-11	2	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	17.3030	0.9604	192: 13C-DiCB-15	0.1000
15	DiCB-13/12	2	222.00030	191: 13C-DiCB-4	Nearest	Relative Retention Time	17.6953	0.9831	192: 13C-DiCB-15	0.1500
16	DiCB-15	2	222.00030	192: 13C-DiCB-15	Nearest	Relative Retention Time	18.0455	1.0017	192: 13C-DiCB-15	0.1000
17	Total DiCB	0	222.00030	None	Totals	Retention Time	17.9745	0.0000	None	0.0000
18		2		None	Nearest	Retention Time	0.0000	0.0000	None	0.2000
19	TrCB-19	2	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	14.7530	1.0009	194: 13C-TrCB-19	0.1000
20	TrCB-30/18	2	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	16.9387	1.1431	194: 13C-TrCB-19	0.1000
21	TrCB-17	2	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	17.4572	1.1843	194: 13C-TrCB-19	0.1000
22	TrCB-27	2	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	17.7093	1.2004	194: 13C-TrCB-19	0.1000
23	TrCB-24	2	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	17.8775	1.2104	194: 13C-TrCB-19	0.1000
24	TrCB-16	2	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	18.0035	1.2150	194: 13C-TrCB-19	0.1000
25	TrCB-32	2	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	18.6200	1.2629	194: 13C-TrCB-19	0.1000
26	TrCB-34	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	20.1287	1.3617	194: 13C-TrCB-19	0.1000
27	TrCB-23	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	20.3305	1.3739	194: 13C-TrCB-19	0.1000
28	TrCB-26/29	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	20.7032	1.3954	194: 13C-TrCB-19	0.1500
29	TrCB-25	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	20.9670	0.7946	195: 13C-TrCB-37	0.1000
30	TrCB-31	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	21.3552	0.8082	195: 13C-TrCB-37	0.1000
31	TrCB-28/20	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	21.7278	0.8209	195: 13C-TrCB-37	0.3000
32	TrCB-21/33	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	21.9918	0.8302	195: 13C-TrCB-37	0.2000
33	TrCB-22	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	22.4730	0.8492	195: 13C-TrCB-37	0.1000
34	TrCB-36	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	24.3673	0.9210	195: 13C-TrCB-37	0.1000
35	TrCB-39	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	24.8020	0.9369	195: 13C-TrCB-37	0.1000
36	TrCB-38	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	25.5162	0.9627	195: 13C-TrCB-37	0.1000
37	TrCB-35	3	255.96130	194: 13C-TrCB-19	Nearest	Relative Retention Time	26.0907	0.9838	195: 13C-TrCB-37	0.1000
38	TrCB-37	3	255.96130	195: 13C-TrCB-37	Nearest	Relative Retention Time	26.5875	1.0011	195: 13C-TrCB-37	0.1000
39	Total TrCB	0	255.96130	None	Totals	Retention Time	26.5073	0.0000	None	0.0000
40		2		None	Nearest	Retention Time	0.0000	1.0000	None	0.5000
41	TeCB-54	2	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	18.4236	1.0010	197: 13C-TeCB-54	0.1000
42	TeCB-50/53	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	21.9142	1.1436	197: 13C-TeCB-54	0.2000
43	TeCB-45	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	22.2092	1.1827	197: 13C-TeCB-54	0.1000
44	TeCB-51	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	21.0292	1.1868	197: 13C-TeCB-54	0.1000
45	TeCB-46	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	23.9325	1.2018	197: 13C-TeCB-54	0.1000
46	TeCB-52	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	24.2275	1.2925	197: 13C-TeCB-54	0.2000
47	TeCB-73	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	24.1033	1.3037	197: 13C-TeCB-54	0.2000
48	TeCB-43	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	24.4915	1.3099	197: 13C-TeCB-54	0.1000
49	TeCB-69/49	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	24.8797	1.3216	197: 13C-TeCB-54	0.1500
50	TeCB-48	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	25.1902	1.3424	197: 13C-TeCB-54	0.1000
51	TeCB-44/47/65	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	25.5317	1.3587	197: 13C-TeCB-54	0.2000
52	TeCB-59/62/75	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	25.7957	1.3760	197: 13C-TeCB-54	0.1500
53	TeCB-42	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	26.2460	1.3905	197: 13C-TeCB-54	0.1000
54	TeCB-41	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	26.4012	1.4115	197: 13C-TeCB-54	0.1500
55	TeCB-40/71	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	21.8210	1.4271	197: 13C-TeCB-54	0.1500
56	TeCB-64	3	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	26.6652	1.4414	197: 13C-TeCB-54	0.1000
57	TeCB-72	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	27.7208	0.7974	198: 13C-TeCB-81	0.1000
58	TeCB-68	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	28.0672	0.8093	198: 13C-TeCB-81	0.1000
59	TeCB-57	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	28.5958	0.8237	198: 13C-TeCB-81	0.1000
60	TeCB-58	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	28.6875	0.8212	198: 13C-TeCB-81	0.1000
61	TeCB-67	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	29.0680	0.8372	198: 13C-TeCB-81	0.1000
62	TeCB-63	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	29.4160	0.8491	198: 13C-TeCB-81	0.2000
63	TeCB-61/70/74/76	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	29.8352	0.8573	198: 13C-TeCB-81	0.1500
64	TeCB-66	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	30.2362	0.8686	198: 13C-TeCB-81	0.1500

Ready

Y:\ATG\12D5\JAN2012.PRO\MethDB\1668209EPA12D8_RRT_03122012totalsum.mdb - TargetLynx Method Editor

File Edit Update View Compound Help

	Compound Name	MS Func	MS Trace	IS	Locate Peak Selection	Locate Peak Using	RT (min)	Predicted RRT	RRT Reference	RT Win (±
64	TeCB-66	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	30.2362	0.8686	198: 13C-TeCB-81	0.150
65	TeCB-55	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	30.4367	0.8740	198: 13C-TeCB-81	0.100
66	TeCB-56	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	31.0563	0.8912	198: 13C-TeCB-81	0.100
67	TeCB-60	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	31.3298	0.8992	198: 13C-TeCB-81	0.100
68	TeCB-80	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	31.8402	0.9148	198: 13C-TeCB-81	0.100
69	TeCB-79	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	33.7358	0.9674	198: 13C-TeCB-81	0.100
70	TeCB-78	4	289.92240	197: 13C-TeCB-54	Nearest	Relative Retention Time	34.4283	0.9845	198: 13C-TeCB-81	0.100
71	TeCB-81	4	289.92240	198: 13C-TeCB-81	Nearest	Relative Retention Time	34.9570	1.0006	198: 13C-TeCB-81	0.100
72	TeCB-77	4	289.92240	199: 13C-TeCB-77	Nearest	Relative Retention Time	35.6678	1.0011	199: 13C-TeCB-77	0.100
73	Total TeCB	0	289.92240	None	Totals	Retention Time	35.5713	0.0000	None	0.000
74		3		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
75	PeCB-104	3	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	25.0970	1.0019	201: 13C-PeCB-104	0.1000
76	PeCB-96	3	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	25.5473	1.0180	201: 13C-PeCB-104	0.1000
77	PeCB-103	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	28.7417	1.1112	201: 13C-PeCB-104	0.1000
78	PeCB-94	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	29.0332	1.1224	201: 13C-PeCB-104	0.1000
79	PeCB-95	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	29.2155	1.1429	201: 13C-PeCB-104	0.1000
80	PeCB-100/93	4	325.8804	201: 13C-PeCB-104	Nearest	Relative Retention Time	27.9397	1.1530	201: 13C-PeCB-104	0.2500
81	PeCB-102/98	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	29.7077	1.1605	201: 13C-PeCB-104	0.2500
82	PeCB-88/91	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	29.8170	1.1856	201: 13C-PeCB-104	0.1500
83	PeCB-84	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	30.0903	1.1954	201: 13C-PeCB-104	0.2000
84	PeCB-89	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	30.6918	1.2192	201: 13C-PeCB-104	0.2000
85	PeCB-121	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	31.2205	1.2387	201: 13C-PeCB-104	0.2000
86	PeCB-92	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	31.6762	0.8358	202: 13C-PeCB-123	0.1000
87	PeCB-113/90/101	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	32.3687	0.8516	202: 13C-PeCB-123	0.1500
88	PeCB-83	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	28.2130	0.8689	202: 13C-PeCB-123	0.1000
89	PeCB-99	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	33.0067	0.8724	202: 13C-PeCB-123	0.1000
90	PeCB-112	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	33.1160	0.8762	202: 13C-PeCB-123	0.1000
91	PeCB-108/119/86/97/125/87	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	33.2618	0.8907	202: 13C-PeCB-123	0.2000
92	PeCB-117/116/85	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	33.7358	0.9099	202: 13C-PeCB-123	0.2000
93	PeCB-110/115	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	34.5288	0.9160	202: 13C-PeCB-123	0.1000
94	PeCB-82	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	34.8658	0.9259	202: 13C-PeCB-123	0.1000
95	PeCB-111	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	35.7407	0.9404	202: 13C-PeCB-123	0.1000
96	PeCB-120	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	36.3057	0.9547	202: 13C-PeCB-123	0.1000
97	PeCB-107/124	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	37.7092	0.9894	202: 13C-PeCB-123	0.1500
98	PeCB-109	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	38.0372	0.9977	202: 13C-PeCB-123	0.1000
99	PeCB-123	4	325.88040	202: 13C-PeCB-123	Nearest	Relative Retention Time	38.1830	1.0010	202: 13C-PeCB-123	0.1000
100	PeCB-106	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	38.3107	1.0043	202: 13C-PeCB-123	0.1000
101	PeCB-118	4	325.88040	203: 13C-PeCB-118	Nearest	Relative Retention Time	38.5658	1.0010	203: 13C-PeCB-118	0.1000
102	PeCB-122	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	39.0032	1.0112	203: 13C-PeCB-118	0.1000
103	PeCB-114	4	325.88040	204: 13C-PeCB-114	Nearest	Relative Retention Time	39.2220	1.0005	204: 13C-PeCB-114	0.1000
104	PeCB-105	4	325.88040	205: 13C-PeCB-105	Nearest	Relative Retention Time	40.0240	1.0009	205: 13C-PeCB-105	0.1000
105	PeCB-127	4	325.88040	201: 13C-PeCB-104	Nearest	Relative Retention Time	41.8646	1.0442	205: 13C-PeCB-105	0.1000
106	PeCB-126	4	325.88040	206: 13C-PeCB-126	Nearest	Relative Retention Time	43.8698	1.0009	206: 13C-PeCB-126	0.1000
107	Total PeCB	0	325.8804	None	Totals	Retention Time	43.7733	0.0000	None	0.0000
108		4		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
109	HxCB-155	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	32.3687	1.0012	208: 13C-HxCB-155	0.1000
110	HxCB-152	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	32.5692	1.0075	208: 13C-HxCB-155	0.1000
111	HxCB-150	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	33.0067	1.0156	208: 13C-HxCB-155	0.1000
112	HxCB-136	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	33.3895	1.0264	208: 13C-HxCB-155	0.1000
113	HxCB-145	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	35.2668	1.0380	208: 13C-HxCB-155	0.1000
114	HxCB-148	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	36.0142	1.0939	208: 13C-HxCB-155	0.1000
115	HxCB-151/135	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	36.3240	1.1152	208: 13C-HxCB-155	0.1500
116	HxCB-154	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	36.7067	1.1273	208: 13C-HxCB-155	0.1000
117	HxCB-144	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	37.1623	1.1385	208: 13C-HxCB-155	0.1000
118	HxCB-147/149	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	37.4175	1.1508	208: 13C-HxCB-155	0.1000
119	HxCB-134/143	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	37.8915	1.1640	208: 13C-HxCB-155	0.1000
120	HxCB-139/140	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	38.1467	1.1755	208: 13C-HxCB-155	0.1000
121	HxCB-131	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	38.3288	1.1809	208: 13C-HxCB-155	0.1000
122	HxCB-142	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	38.7117	1.1893	208: 13C-HxCB-155	0.1000
123	HxCB-132	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	39.3495	1.2000	208: 13C-HxCB-155	0.1000
124	HxCB-133	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	39.8417	1.2182	208: 13C-HxCB-155	0.1000
125	HxCB-165	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	40.1515	0.8660	209: 13C-HxCB-167	0.1000
126	HxCB-146	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	40.3155	0.8730	209: 13C-HxCB-167	0.1000
127	HxCB-161	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	40.9170	0.8764	209: 13C-HxCB-167	0.1000

Ready

Y:\ATG\12D5\JAN2012.PRO\MethDB\1668209EPA12D8_RRT_03122012totalsum.mdb - TargetLynx Method Editor

File Edit Update View Compound Help

	Compound Name	MS Func	MS Trace	IS	Locate Peak Selection	Locate Peak Using	RT (mins)	Predicted RRT	RRT Reference	RT W
127	HxCB-161	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	40.9170	0.8764	209: 13C-HxCB-167	0
128	HxCB-153/168	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	32.1318	0.8908	209: 13C-HxCB-167	0
129	HxCB-141	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	41.1540	0.8954	209: 13C-HxCB-167	0
130	HxCB-130	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	41.6462	0.9058	209: 13C-HxCB-167	0
131	HxCB-137	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	41.9560	0.9109	209: 13C-HxCB-167	0
132	HxCB-164	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	42.0835	0.9132	209: 13C-HxCB-167	0
133	HxCB-138/163/129	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	42.4663	0.9221	209: 13C-HxCB-167	0
134	HxCB-160	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	42.6668	0.9252	209: 13C-HxCB-167	0.
135	HxCB-158	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	42.9402	0.9317	209: 13C-HxCB-167	0.
136	HxCB-128/166	4	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	43.9973	0.9545	209: 13C-HxCB-167	0.
137	HxCB-159	5	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	45.2588	0.9801	209: 13C-HxCB-167	0
138	HxCB-162	5	359.84150	208: 13C-HxCB-155	Nearest	Relative Retention Time	45.6130	0.9875	209: 13C-HxCB-167	0.
139	HxCB-167	5	359.84150	209: 13C-HxCB-167	Nearest	Relative Retention Time	46.2088	1.0000	209: 13C-HxCB-167	0
140	HxCB-156/157	5	359.84150	210: 13C-HxCB-156/157	Nearest	Relative Retention Time	47.6095	1.0006	210: 13C-HxCB-156/.	0.
141	HxCB-169	5	359.84150	211: 13C-HxCB-169	Nearest	Relative Retention Time	51.6828	1.0006	211: 13C-HxCB-169	0
142	Total HxCB	0	359.84150	None	Totals	Retention Time	51.5605	0.0000	None	0
143		3		None	Nearest	Retention Time	0.0000	0.0000	None	1
144	HpCB-188	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	39.2402	1.0005	213: 13C-HpCB-188	0
145	HpCB-179	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	39.6412	1.0106	213: 13C-HpCB-188	0
146	HpCB-184	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	40.3155	1.0266	213: 13C-HpCB-188	0.
147	HpCB-176	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	40.7530	1.0372	213: 13C-HpCB-188	0
148	HpCB-186	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	41.3180	1.0511	213: 13C-HpCB-188	0
149	HpCB-178	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	43.0313	1.0923	213: 13C-HpCB-188	0.
150	HpCB-175	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	43.8152	1.1125	213: 13C-HpCB-188	0
151	HpCB-187	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	44.1613	1.1232	213: 13C-HpCB-188	0
152	HpCB-182	4	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	44.4165	1.1271	213: 13C-HpCB-188	0
153	HpCB-183	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	44.9370	1.1417	213: 13C-HpCB-188	0
154	HpCB-185	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	45.2107	1.1444	213: 13C-HpCB-188	0.
155	HpCB-174	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	45.7580	1.1486	213: 13C-HpCB-188	0.
156	HpCB-177	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	46.2572	1.1583	213: 13C-HpCB-188	0.
157	HpCB-181	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	46.5147	1.1748	213: 13C-HpCB-188	0.
158	HpCB-171/173	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	48.5593	1.1814	213: 13C-HpCB-188	0.
159	HpCB-172	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	48.9135	0.8930	214: 13C-HpCB-189	0.
160	HpCB-192	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	49.3322	0.8990	214: 13C-HpCB-189	0.
161	HpCB-180/193	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	49.8152	0.9061	214: 13C-HpCB-189	0.
162	HpCB-191	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	50.9422	0.9150	214: 13C-HpCB-189	0.
163	HpCB-170	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	51.6023	0.9364	214: 13C-HpCB-189	0.
164	HpCB-190	5	393.80250	213: 13C-HpCB-188	Nearest	Relative Retention Time	52.9225	0.9485	214: 13C-HpCB-189	0.
165	HpCB-189	6	393.80250	214: 13C-HpCB-189	Nearest	Relative Retention Time	54.8423	1.0004	214: 13C-HpCB-189	0
166	Total HpCB	0	393.80250	None	Totals	Retention Time	54.7358	0.0000	None	0
167		4		None	Nearest	Retention Time	0.0000	0.0000	None	1
168	OcCB-202	5	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	45.9352	1.0008	216: 13C-OcCB-202	0
169	OcCB-201	5	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	47.0782	1.0250	216: 13C-OcCB-202	0
170	OcCB-204	5	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	47.9153	1.0426	216: 13C-OcCB-202	0.
171	OcCB-197	5	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	48.2052	1.0490	216: 13C-OcCB-202	0.
172	OcCB-200	5	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	48.3340	1.0513	216: 13C-OcCB-202	0.
173	OcCB-198/199	5	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	51.7955	1.1247	216: 13C-OcCB-202	0.
174	OcCB-196	5	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	52.6648	0.9290	217: 13C-OcCB-205	0
175	OcCB-203	5	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	52.9063	0.9330	217: 13C-OcCB-205	0.
176	OcCB-195	6	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	54.5517	0.9577	217: 13C-OcCB-205	0.
177	OcCB-194	6	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	56.9347	0.9924	217: 13C-OcCB-205	0
178	OcCB-205	6	427.76350	217: 13C-OcCB-205	Nearest	Relative Retention Time	57.3222	1.0003	217: 13C-OcCB-205	0
179	Total OcCB	0	427.76350	None	Totals	Retention Time	57.2543	0.0000	None	0
180		5		None	Nearest	Retention Time	0.0000	0.0000	None	1
181	NoCB-208	6	461.72450	219: 13C-NoCB-208	Nearest	Relative Retention Time	54.2805	1.0002	219: 13C-NoCB-208	0
182	NoCB-207	6	461.72450	219: 13C-NoCB-208	Nearest	Relative Retention Time	55.4235	1.0140	219: 13C-NoCB-208	0.
183	NoCB-206	6	461.72450	220: 13C-NoCB-206	Nearest	Relative Retention Time	58.9392	1.0007	220: 13C-NoCB-206	0
184	Total NoCB	0	461.72450	None	Totals	Retention Time	58.8625	0.0000	None	0
185		5		None	Nearest	Retention Time	0.0000	0.0000	None	1
186	DeCB-209	6	497.68250	222: 13C-DeCB-209	Nearest	Relative Retention Time	60.5770	1.0006	222: 13C-DeCB-209	0.
187		1		None	Nearest	Retention Time	0.0000	0.0000	None	1
188	13C-MoCB-1	1	209.07950	224: 13C-DiCB-9	Nearest	Relative Retention Time	8.3712	0.6236	224: 13C-DiCB-9	0
189	13C-MoCB-3	1	209.07950	224: 13C-DiCB-9	Nearest	Relative Retention Time	10.8167	0.8100	224: 13C-DiCB-9	0
190		1		None	Nearest	Retention Time	0.0000	0.0000	None	1

Ready

Y:\ATG\12D5\JAN2012.PRO\MethDB\1668209EPA12D8_RRT_03122012totalsum.mdb - TargetLynx Method Editor

File Edit Update View Compound Help

	Compound Name	MS Func	MS Trace	IS	Locate Peak Selection	Locate Peak Using	RT (mins)	Predicted RRT	RRT Reference	RT Win (m
177	OcCB-194	6	427.76350	216: 13C-OcCB-202	Nearest	Relative Retention Time	56.9347	0.9924	217: 13C-OcCB-205	0.1000
178	OcCB-205	6	427.76350	217: 13C-OcCB-205	Nearest	Relative Retention Time	57.3222	1.0003	217: 13C-OcCB-205	0.1000
179	Total OcCB	0	427.76350	None	Totals	Retention Time	57.2543	0.0000	None	0.0000
180		5		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
181	NoCB-208	6	461.72450	219: 13C-NoCB-208	Nearest	Relative Retention Time	54.2805	1.0002	219: 13C-NoCB-208	0.1000
182	NoCB-207	6	461.72450	219: 13C-NoCB-208	Nearest	Relative Retention Time	55.4235	1.0140	219: 13C-NoCB-208	0.1000
183	NoCB-206	6	461.72450	220: 13C-NoCB-206	Nearest	Relative Retention Time	58.8302	1.0067	220: 13C-NoCB-206	0.1000
184	Total NoCB	0	461.72450	None	Totals	Retention Time	58.8625	0.0000	None	0.0000
185		5		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
186	DeCB-209	6	497.68260	222: 13C-DeCB-209	Nearest	Relative Retention Time	60.5770	1.0006	222: 13C-DeCB-209	0.2000
187		1		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
188	13C-MoCB-1	1	200.07950	224: 13C-DiCB-9	Nearest	Relative Retention Time	8.3712	0.6236	224: 13C-DiCB-9	0.1000
189	13C-MoCB-3	1	200.07950	224: 13C-DiCB-9	Nearest	Relative Retention Time	10.8167	0.8100	224: 13C-DiCB-9	0.1200
190		1		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
191	13C-DiCB-4	1	234.04060	224: 13C-DiCB-9	Nearest	Relative Retention Time	11.1043	0.8310	224: 13C-DiCB-9	1.0000
192	13C-DiCB-15	2	234.04060	224: 13C-DiCB-9	Nearest	Relative Retention Time	13.4220	1.3415	224: 13C-DiCB-9	1.0000
193		2		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
194	13C-TrCB-19	2	268.00160	224: 13C-DiCB-9	Nearest	Relative Retention Time	14.7250	1.0982	224: 13C-DiCB-9	1.0000
195	13C-TrCB-37	3	268.00160	225: 13C-TeCB-52	Nearest	Relative Retention Time	26.5565	1.1093	225: 13C-TeCB-52	1.8000
196		3		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
197	13C-TeCB-54	2	301.96260	225: 13C-TeCB-52	Nearest	Relative Retention Time	18.3958	0.7743	225: 13C-TeCB-52	1.4000
198	13C-TeCB-81	4	301.96260	225: 13C-TeCB-52	Nearest	Relative Retention Time	35.6313	1.4478	225: 13C-TeCB-52	1.5000
199	13C-TeCB-77	4	301.96260	225: 13C-TeCB-52	Nearest	Relative Retention Time	34.9387	1.4744	225: 13C-TeCB-52	1.5000
200		3		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
201	13C-PeCB-104	3	337.9207	226: 13C-PeCB-101	Nearest	Relative Retention Time	25.0660	0.7799	226: 13C-PeCB-101	1.5000
202	13C-PeCB-123	4	337.9207	226: 13C-PeCB-101	Nearest	Relative Retention Time	38.1283	1.1725	226: 13C-PeCB-101	1.4000
203	13C-PeCB-118	4	337.9207	226: 13C-PeCB-101	Nearest	Relative Retention Time	38.5293	1.1843	226: 13C-PeCB-101	1.4000
204	13C-PeCB-114	4	337.9207	226: 13C-PeCB-101	Nearest	Relative Retention Time	39.1855	1.2041	226: 13C-PeCB-101	1.4000
205	13C-PeCB-105	4	337.9207	226: 13C-PeCB-101	Nearest	Relative Retention Time	39.9875	1.2284	226: 13C-PeCB-101	1.2000
206	13C-PeCB-126	4	337.9207	226: 13C-PeCB-101	Nearest	Relative Retention Time	43.8333	1.3429	226: 13C-PeCB-101	1.4000
207		4		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
208	13C-HxCB-155	4	371.88170	227: 13C-HxCB-138	Nearest	Relative Retention Time	32.0953	0.7630	227: 13C-HxCB-138	1.4000
209	13C-HxCB-167	5	371.88170	227: 13C-HxCB-138	Nearest	Relative Retention Time	46.1767	1.0863	227: 13C-HxCB-138	1.8000
210	13C-HxCB-156/157	5	371.88170	227: 13C-HxCB-138	Nearest	Relative Retention Time	47.5933	1.1184	227: 13C-HxCB-138	1.6000
211	13C-HxCB-169	5	371.88170	227: 13C-HxCB-138	Nearest	Relative Retention Time	51.6505	1.2108	227: 13C-HxCB-138	1.5000
212		4		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
213	13C-HpCB-188	4	405.84280	228: 13C-OcCB-194	Nearest	Relative Retention Time	39.2037	0.7028	228: 13C-OcCB-194	1.5000
214	13C-HpCB-189	6	405.84280	228: 13C-OcCB-194	Nearest	Relative Retention Time	54.8228	0.9691	228: 13C-OcCB-194	1.8000
215		5		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
216	13C-OcCB-202	5	439.80380	228: 13C-OcCB-194	Nearest	Relative Retention Time	45.9028	0.8188	228: 13C-OcCB-194	1.2000
217	13C-OcCB-205	6	439.80380	228: 13C-OcCB-194	Nearest	Relative Retention Time	56.8960	1.0073	228: 13C-OcCB-194	1.4000
218		5		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
219	13C-NoCB-208	6	473.76480	228: 13C-OcCB-194	Nearest	Relative Retention Time	54.2417	0.9615	228: 13C-OcCB-194	1.8000
220	13C-NoCB-206	6	473.76480	228: 13C-OcCB-194	Nearest	Relative Retention Time	58.9108	1.0368	228: 13C-OcCB-194	1.4000
221		5		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
222	13C-DeCB-209	6	509.7229	228: 13C-OcCB-194	Nearest	Relative Retention Time	60.5577	1.0668	228: 13C-OcCB-194	1.4000
223		2		None	Nearest	Retention Time	0.0000	0.0000	None	1.0000
224	13C-DiCB-9	2	234.04060	227: 13C-HxCB-138	Nearest	Relative Retention Time	18.0315	0.3246	227: 13C-HxCB-138	1.0000
225	13C-TeCB-52	3	301.96260	227: 13C-HxCB-138	Nearest	Relative Retention Time	23.9015	0.5730	227: 13C-HxCB-138	2.0000
226	13C-PeCB-101	4	337.9207	227: 13C-HxCB-138	Nearest	Relative Retention Time	32.3687	0.7694	227: 13C-HxCB-138	1.2000
227	13C-HxCB-138	4	371.88170	227: 13C-HxCB-138	Nearest	Retention Time	43.9300	1.0000	227: 13C-HxCB-138	1.5000
228	13C-OcCB-194	6	439.80380	227: 13C-HxCB-138	Nearest	Relative Retention Time	57.3028	1.3180	227: 13C-HxCB-138	1.4000
229		1		None	Nearest	Retention Time	0.0000	0.0000	None	0.0650
230	13C-TrCB-28	3	268.00160	225: 13C-TeCB-52	Nearest	Relative Retention Time	21.6312	0.9094	225: 13C-TeCB-52	1.2000
231	13C-PeCB-111	4	337.9207	226: 13C-PeCB-101	Nearest	Relative Retention Time	35.7042	1.0997	226: 13C-PeCB-101	1.5000
232	13C-HpCB-178	4	405.84280	227: 13C-HxCB-138	Nearest	Relative Retention Time	43.0132	1.0132	227: 13C-HxCB-138	1.5000
233		1		None	Nearest	Retention Time	0.0000	0.0000	None	0.0650
234	Function 1 PFK	1	218.986	None	Nearest	Retention Time	11.3528	0.0000	None	0.0650
235	Function 2 PFK	2	242.9856	None	Nearest	Retention Time	16.2557	0.0000	None	0.0840
236	Function 3 PFK	3	280.9825	None	Nearest	Retention Time	22.5507	0.0000	None	0.0520
237	Function 4 PFK	4	330.9792	None	Nearest	Retention Time	37.3447	0.0000	None	0.0460
238	Function 5 PFK	5	354.9792	None	Nearest	Retention Time	45.6292	0.0000	None	0.0420
239	Function 6 PFK	6	454.9728	None	Nearest	Retention Time	58.2906	1.0000	None	0.0420

Ready

MOCB-1 600161 50

JMC 43012

13C-MoCB-1 1542465 100

$$RRF = \frac{(600161)(100)}{(1542465)(50)} = 0.77818427$$

$$\%D = \frac{0.80611 - 0.77818}{0.80611}(100\%) = 3.46\%$$

CS-3 209 (50) 12DXN003 9/17/12 00:16 16FE121208_11

OoCB-204 LV, RRF 0.89278 %D -12.7 Ref Std is Avg Response of 202/205

$$\frac{1128725 + 1109556}{2} = 1119140.5$$

AVG RRF = 1.02238

$$RRF = \frac{(499572)(100)}{(1119140.5)(50)} = 0.89278$$

$$\%D = \frac{1.02238 - 0.89278}{1.02238}(100\%) = 12.68\%$$

L - Analyzed 09-09-11 on 12D8
CS-1 11DXN123 KSS
9/9/11 18:02:29 ST0909
09SE111208_3

PeCB-118 conc 1.0
Abs resp 21079 (sum of 2 areas)

13C-PeCB-118 conc 100
Abs resp 1471896 (sum of 2 areas)

$$RRF = \frac{(21079)(100)}{(1471896)(1.0)} = 1.4321$$

%RSD for PeCB-118

1.43210
1.06672
1.06817
1.06488
1.04127

$\overline{RRF} = 1.1346$ ✓

%RSD 14.69% ✓

The co-eluters are all from the 1pt calibration. This can be found in the CS-3 level of the initial calibration.

Using the 113/90/101 co-eluters as an example.

$$RRF = \frac{[\text{area of native}]\,[\text{amount of IS}]\,[\text{number of IS used}]}{[\text{area of all IS peaks used}]\,[\text{amount of native}]\,[\text{number of coeluters}]}$$

For our standard calibration curve the native levels are

CS-1	1 pg
-2	5
-3	50 ← using CS-3 below
-4	400
-5	2000

All IS & RS in at 100pg

From p 1983 [area of native] = 2345022

From p 1986 [area of all IS peaks]

= total area of the six ^{13}C-PCB

= 2159748 + 1600091 + 1669704 + 1668164 + 1646777 + 1696359

= 10440803

[amount of IS] [number of IS used] = 100 × 6 = 600

[amount of native] [number of coeluters] = 50 × 3 = 150

put this all together (next page)

$$RRF = \frac{(2345022)(600)}{(16440803)(150)} = 0.898$$

value on page 1983
is 0.894

Again minor difference is due to wher/when software rounds.

Dataset: M:\MassLynx\JAN2011.PRO\CA0909201112D81668A209totals.qld

Last Altered: Tuesday, September 13, 2011 15:22:48 Pacific Daylight Time
Printed: Tuesday, September 13, 2011 15:32:53 Pacific Daylight Time

Name: 09SE1112D8_5, Date: 09-Sep-2011, Time: 20:20:45, ID: ST0909B, Description: CS-3 209 (50) 11DXN131 KSS

#	Name	Trace	RT	Std Conc	Abs Resp	RRF	Ratio (Actual)	Ratio Flag	Mod Date
50	TeCB-48	289.92240	26.95	50.0	788459	0.85018	0.792	NO	
51	TeCB-44/47/65	289.92240	27.28	150.0	2529618	0.90921	0.770	NO	
52	TeCB-59/62/75	289.92240	27.65	150.0	3249145	1.16783	0.774	NO	
53	TeCB-42	289.92240	27.90	50.0	752479	0.81138	0.778	NO	
54	TeCB-41	289.92240	28.38	50.0	599952	0.64691	0.757	NO	
55	TeCB-40/71	289.92240	28.53	100.0	1695657	0.91419	0.772	NO	
56	TeCB-64	289.92240	28.81	50.0	1153027	1.24328	0.773	NO	
57	TeCB-72	289.92240	29.88	50.0	831364	0.89644	0.714	NO	
58	TeCB-68	289.92240	30.24	50.0	869628	0.93770	0.708	NO	
59	TeCB-57	289.92240	30.77	50.0	800278	0.86292	0.724	NO	
60	TeCB-58	289.92240	31.08	50.0	807721	0.87095	0.714	NO	
61	TeCB-67	289.92240	31.30	50.0	837319	0.90286	0.710	NO	
62	TeCB-63	289.92240	31.63	50.0	888732	0.95830	0.718	NO	
63	TeCB-61/70/74/76	289.92240	32.05	200.0	3275897	0.88308	0.725	NO	
64	TeCB-66	289.92240	32.47	50.0	783460	0.84479	0.709	NO	
65	TeCB-55	289.92240	32.67	50.0	769148	0.82935	0.708	NO	
66	TeCB-56	289.92240	33.31	50.0	747338	0.80584	0.720	NO	
67	TeCB-60	289.92240	33.58	50.0	772120	0.83256	0.727	NO	
68	TeCB-80	289.92240	34.09	50.0	889543	0.95917	0.718	NO	
69	TeCB-79	289.92240	36.02	50.0	861480	0.92891	0.719	NO	
70	TeCB-78	289.92240	36.73	50.0	737578	0.79531	0.736	NO	
71	TeCB-81	289.92240	37.28	50.0	737629	0.93666	0.702	NO	
72	TeCB-77	289.92240	37.99	50.0	779549	0.96446	0.718	NO	
73	Total TeCB	289.92240		50.0					
74				0.0					
75	PeCB-104	325.88040	27.18	50.0	1202114	1.11320	1.580	NO	
76	PeCB-96	325.88040	27.65	50.0	1043810	1.19368	1.598	NO	
77	PeCB-103	325.88040	30.12	50.0	760032	0.86916	1.561	NO	
78	PeCB-94	325.88040	30.39	50.0	653964	0.74786	1.566	NO	
79	PeCB-95	325.88040	30.94	50.0	701262	0.80195	1.585	NO	
80	PeCB-100/93	325.8804	31.25	100.0	1458186	0.83378	1.576	NO	
81	PeCB-102/98	325.88040	31.43	100.0	1375355	0.78642	1.590	NO	
82	PeCB-88/91	325.88040	31.96	100.0	1413924	0.80847	1.606	NO	
83	PeCB-84	325.88040	32.32	50.0	606538	0.69363	1.580	NO	
84	PeCB-89	325.88040	32.92	50.0	640176	0.73209	1.569	NO	
85	PeCB-121	325.88040	33.45	50.0	945391	1.08113	1.575	NO	
86	PeCB-92	325.88040	33.93	50.0	668720	0.76474	1.571	NO	
87	PeCB-113/90/101	325.88040	34.64	150.0	2345022	0.89391	1.575	NO	
88	PeCB-83	325.88040	35.27	50.0	706729	0.80820	1.586	NO	
89	PeCB-99	325.88040	35.42	50.0	750455	0.85821	1.807	YES	
90	PeCB-112	325.88040	35.55	50.0	759581	0.86864	1.485	NO	
91	PeCB-108/119/86/97/125/87	325.88040	36.02	300.0	4748971	0.90514	1.576	NO	
92	PeCB-117/116/85	325.88040	36.95	150.0	2570730	0.97995	1.584	NO	
93	PeCB-110/115	325.88040	37.17	100.0	1725088	0.98639	1.589	NO	
94	PeCB-82	325.88040	37.55	50.0	573105	0.65539	1.565	NO	
95	PeCB-111	325.88040	38.04	50.0	940390	1.07541	1.588	NO	
96	PeCB-120	325.88040	38.63	50.0	941348	1.07651	1.606	NO	
97	PeCB-107/124	325.88040	40.05	100.0	1798874	1.02858	1.596	NO	
98	PeCB-109	325.88040	40.36	50.0	1126259	1.28797	1.714	NO	

Calculated RRF

3113

Dataset: M:\MassLynx\JAN2011.PRO\CA09092011112D81668A209totals.qld

Last Altered: Tuesday, September 13, 2011 15:22:48 Pacific Daylight Time
Printed: Tuesday, September 13, 2011 15:32:53 Pacific Daylight Time

Name: 09SE1112D8_5, Date: 09-Sep-2011, Time: 20:20:45, ID: ST0909B, Description: CS-3 209 (50) 11DXN131 KSS

#	Name	Trace	RT	Std Conc	Abs Resp	RRT	Ratio (Actual)	Ratio Flag	Mod Date
99	PeCB-123	325.88040	40.52	50.0	912523	1.14062	1.438	NO	
100	PeCB-106	325.88040	40.67	50.0	739620	0.84582	1.600	NO	
101	PeCB-118	325.88040	40.92	50.0	891766	1.06817	1.570	NO	
102	PeCB-122	325.88040	41.36	50.0	897635	1.02652	1.640	NO	
103	PeCB-114	325.88040	41.60	50.0	884046	1.05990	1.521	NO	
104	PeCB-105	325.88040	42.40	50.0	882850	1.07222	1.605	NO	
105	PeCB-127	325.88040	44.24	50.0	894532	1.02297	1.618	NO	
106	PeCB-126	325.88040	46.27	50.0	843972	0.99504	1.625	NO	
107	Total PeCB	325.8804		50.0					
108				0.0					
109	HxCB-155	359.84150	34.40	50.0	1213884	1.09317	1.231	NO	
110	HxCB-152	359.84150	34.64	50.0	1122220	1.36995	1.164	NO	
111	HxCB-150	359.84150	34.86	50.0	1078327	1.31637	1.282	NO	
112	HxCB-136	359.84150	35.29	50.0	1028242	1 25523	1.223	NO	
113	HxCB-145	359.84150	35.69	50.0	1045938	1.27683	1.233	NO	
114	HxCB-148	359.84150	37.59	50.0	819643	1.00058	1.238	NO	
115	HxCB-151/135	359.84150	38.34	100.0	1579698	0.96421	1.219	NO	
116	HxCB-154	359.84150	38.66	50.0	851568	1.03955	1.225	NO	
117	HxCB-144	359.84150	39.05	50.0	801015	0.97784	1.232	NO	
118	HxCB-147/149	359.84150	39.48	100.0	1650155	1.00721	1.224	NO	
119	HxCB-134/143	359.84150	39.74	100.0	788467	0.48126	1.216	NO	
120	HxCB-139/140	359.84150	40.25	100.0	1672389	1.02079	1.216	NO	
121	HxCB-131	359.84150	40.51	50.0	714958	0.87279	1.222	NO	
122	HxCB-142	359.84150	40.69	50.0	619306	0.75602	1.227	NO	
123	HxCB-132	359.84150	41.07	50.0	725050	0.88511	1.233	NO	
124	HxCB-133	359.84150	41.69	50.0	739438	0.90267	1.210	NO	
125	HxCB-165	359.84150	42.20	50.0	949442	1.15903	1.234	NO	
126	HxCB-146	359.84150	42.51	50.0	1004971	1.22682	1.249	NO	
127	HxCB-161	359.84150	42.67	50.0	814217	0.99396	1.237	NO	
128	HxCB-153/168	359.84150	43.31	100.0	2074191	1.26604	1.236	NO	
129	HxCB-141	359.84150	43.51	50.0	633437	0.77327	1.239	NO	
130	HxCB-130	359.84150	44.02	50.0	675827	0.82502	1.247	NO	
131	HxCB-137	359.84150	44.31	50.0	1006099	1.22820	1.192	NO	
132	HxCB-164	359.84150	44.44	50.0	793997	0.96927	1.238	NO	
133	HxCB-138/163/129	359.84150	44.86	150.0	2708101	1.10197	1.235	NO	
134	HxCB-160	359.84150	45.04	50.0	817172	0.99756	1.235	NO	
135	HxCB-158	359.84150	45.34	50.0	1023532	1 24948	1.226	NO	
136	HxCB-128/166	359.84150	46.39	100.0	1829504	1.11668	1.221	NO	
137	HxCB-159	359.84150	47.64	50.0	775287	0.94643	1.214	NO	
138	HxCB-162	359.84150	47.99	50.0	772290	0.94277	1.220	NO	
139	HxCB-167	359.84150	48.61	50.0	775225	1.03325	1.212	NO	
140	HxCB-156/157	359.84150	50.04	100.0	1471794	1.01180	1.240	NO	
141	HxCB-169	359.84150	54.08	50.0	703352	1.02136	1.249	NO	
142	Total HxCB	359.84150		50.0					
143				50.0					
144	HpCB-188	393.80250	41.60	50.0	1065817	0.97636	1.021	NO	
145	HpCB-179	393.80250	42.00	50.0	998093	1.13752	1.021	NO	
146	HpCB-184	393.80250	42.69	50.0	957320	1.09105	1.035	NO	
147	HpCB-176	393.80250	43.11	50.0	1067507	1.21663	1.035	NO	

Dataset: M:\MassLynx\JAN2011.PRO\ICA0909201112D81668A209totals.qld

Last Altered: Tuesday, September 13, 2011 15:22:48 Pacific Daylight Time
Printed: Tuesday, September 13, 2011 15:32:53 Pacific Daylight Time

Name: 09SE1112D8_5, Date: 09-Sep-2011, Time: 20:20:45, ID: ST0909B, Description: CS-3 209 (50) 11DXN131 KSS

#	Name	Trace	RT	Std Conc	Abs Resp	RRF	Ratio(Actual)	Ratio Flag	Mod Date
148	HpCB-186	393.80250	43.70	50.0	1035470	1.18011	1.023	NO	
149	HpCB-178	393.80250	45.41	50.0	757926	0.86380	1.025	NO	
150	HpCB-175	393.80250	46.21	50.0	786179	0.89600	1.048	NO	
151	HpCB-187	393.80250	46.54	50.0	903073	1.02922	1.024	NO	
152	HpCB-182	393.80250	46.81	50.0	777776	0.88642	1.007	NO	
153	HpCB-183	393.80250	47.33	50.0	1460653	1.66469	1.029	NO	
154	HpCB-185	393.80250		50.0					
155	HpCB-174	393.80250	47.61	50.0	484668	0.55237	1.025	NO	
156	HpCB-177	393.80250	48.16	50.0	572266	0.65221	1.022	NO	
157	HpCB-181	393.80250	48.67	50.0	694586	0.79161	1.025	NO	
158	HpCB-171/173	393.80250	48.93	100.0	1108505	0.63168	1.033	NO	
159	HpCB-172	393.80250	50.96	50.0	592383	0.67513	1.017	NO	
160	HpCB-192	393.80250	51.33	50.0	747204	0.85168	1.032	NO	
161	HpCB-180/193	393.80250	51.71	100.0	1409645	0.80328	1.030	NO	
162	HpCB-191	393.80250	52.23	50.0	778851	0.88765	1.026	NO	
163	HpCB-170	393.80250	53.36	50.0	567712	0.64702	1.059	NO	
164	HpCB-190	393.80250	54.02	50.0	852140	0.97118	1.034	NO	
165	HpCB-189	393.80250	56.70	50.0	651318	0.98202	1.008	NO	
166	Total HpCB	393.80250		50.0					
167				1.0					
168	OcCB-202	427.76350	48.32	50.0	803400	0.81328	0.866	NO	
169	OcCB-201	427.76350	49.48	50.0	896286	1.03508	0.868	NO	
170	OcCB-204	427.76350	50.33	50.0	885292	1.02238	0.847	NO	
171	OcCB-197	427.76350	50.62	50.0	1072683	1.23879	0.859	NO	
172	OcCB-200	427.76350	50.73	50.0	661120	0.76350	0.877	NO	
173	OcCB-198/199	427.76350	54.19	100.0	1238498	0.71514	0.846	NO	
174	OcCB-196	427.76350	55.06	50.0	709404	0.81926	0.867	NO	
175	OcCB-203	427.76350	55.29	50.0	632335	0.73025	0.859	NO	
176	OcCB-195	427.76350	56.53	50.0	521567	0.60233	0.873	NO	
177	OcCB-194	427.76350	58.56	50.0	537800	0.62108	0.870	NO	
178	OcCB-205	427.76350	59.01	50.0	668570	0.89866	0.867	NO	
179	Total OcCB	427.76350		50.0					
180				1.0					
181	NoCB-208	461.72450	56.32	50.0	719879	0.94282	0.779	NO	
182	NoCB-207	461.72450	57.11	50.0	743269	1.15724	0.777	NO	
183	NoCB-206	461.72450	60.81	50.0	515199	0.98884	0.742	NO	
184	Total NoCB	461.72450		50.0					
185				1.0					
186	DeCB-209	497.68260	62.65	50.0	705474	1.11353	1.184	NO	
187				1.0					
188	13C-MoCB-1	200.07950	9.37	100.0	2904476	1.25959	3.011	NO	
189	13C-MoCB-3	200.07950	12.08	100.0	2854253	1.23781	3.062	NO	
190				1.0					
191	13C-DiCB-4	234.04060	12.39	100.0	2254956	0.97791	1.590	NO	
192	13C-DiCB-15	234.04060	19.81	100.0	2427933	1.05293	1.498	NO	
193				1.0					
194	13C-TrCB-19	268.00160	16.30	100.0	1716026	0.74419	1.017	NO	
195	13C-TrCB-37	268.00160	28.71	100.0	1795673	1.17456	1.027	NO	
196				1.0					

313 5

Dataset: M:\MassLynx\JAN2011.PRO\ICA0909201112D81668A209totals.qld

Last Altered: Tuesday, September 13, 2011 15:22:48 Pacific Daylight Time
Printed: Tuesday, September 13, 2011 15:32:53 Pacific Daylight Time

Name: 09SE1112D8_5, Date: 09-Sep-2011, Time: 20:20:45, ID: ST0909B, Description: CS-3 209 (50) 11DXN131 KSS

#	Name	Trace	RT	Std Conc	Abs Resp	RRF	Ratio (Actual)	Ratio Flag	Mod Date
197	13C-TeCB-54	301.96260	20.20	100.0	2372867	1.55211	0.748	NO	
		301.96260	37.26	100.0	1575020	1.03023	0.765	NO	
		301.96260	37.97	100.0	1616546	1.05739	0.758	NO	
				1.0					
201	13C-PeCB-104	337.9207	27.15	100.0	2159748				
202	13C-PeCB-123	337.9207	40.49	100.0	1600051			NO	
203	13C-PeCB-118	337.9207	40.89	100.0	1669704	1.23003	1.599	NO	
204	13C-PeCB-114	337.9207	41.56	100.0	1668164	1.22889	1.586	NO	
205	13C-PeCB-105	337.9207	42.36	100.0	1646777	1.21314	1.607	NO	
206	13C-PeCB-126	337.9207	46.23	100.0	1698359	1.24966	1.571	NO	
207				1.0					
208	13C-HxCB-155	371.88170	34.36	100.0	2220856	1.43775	1.264	NO	
209	13C-HxCB-167	371.88170	48.57	100.0	1500583	0.97145	1.267	NO	
210	13C-HxCB-156/157	371.88170	50.01	200.0	2909270	0.94171	1.239	NO	
211	13C-HxCB-169	371.88170	54.05	100.0	1377288	0.89164	1.241	NO	
212				1.0					
213	13C-HpCB-188	405.84280	41.56	100.0	2183239	2.12487	1.016	NO	
214	13C-HpCB-189	405.84280	56.68	100.0	1326488	1.29103	0.986	NO	
215				1.0					
216	13C-OcCB-202	439.80380	48.28	100.0	1975716	1.92290	0.898	NO	
217	13C-OcCB-205	439.80380	58.99	100.0	1487934	1.44816	0.877	NO	
218				1.0					
219	13C-NoCB-208	473.76480	56.30	100.0	1527077	1.48625	0.796	NO	
220	13C-NoCB-206	473.76480	60.77	100.0	1042026	1.01417	0.777	NO	
221				1.0					
222	13C-DeCB-209	509.7229	62.63	100.0	1267100	1.23323	1.192	NO	
223				1.0					
224	13C-DiCB-9	234.04060	14.86	100.0	2305889	1.49280	1.522	NO	
225	13C-TeCB-52	301.96260	25.93	100.0	1528801	0.98973	0.781	NO	
226	13C-PeCB-101	337.9207	34.64	100.0	1357453	0.87880	1.612	NO	
227	13C-HxCB-138	371.88170	44.81	100.0	1544669	1.00000	1.288	NO	
228	13C-OcCB-194	439.80380	58.54	100.0	1027468	0.66517	0.899	NO	
229				1.0					
230	13C-TrCB-28	268.00160	23.63	100.0	1871972	1.22447	1.003	NO	
231	13C-PeCB-111	337.9207	38.03	100.0	1728328	1.27321	1.600	NO	
232	13C-HpCB-178	405.84280	45.37	100.0	1375605	0.89055	1.039	NO	
233				1.0					
234	Function 1 PFK	218.986	11.36	1.0	3830	3830.39500			
235	Function 2 PFK	242.9856		1.0					
236	Function 3 PFK	280.9825	22.54	1.0	31046	31046.05900			
237	Function 4 PFK	330.9792		1.0					
238	Function 5 PFK	354.9792		1.0					
239	Function 6 PFK	454.9728		1.0					

The six IS used for pentas

You need to sum their areas

G2B080439_calc.

Ion abundance for PeCB - 113/90/101

$$\text{ratio} = \frac{\text{area 325 ion}}{\text{area 327 ion}}$$

See pg 1084 chromatogram

$$\text{ratio} = \frac{1.43\,e^4}{8.83\,e^3} = 1.62$$

ratio limits = $1.55 \pm 15\%$

= ➡ acceptance range of 1.32 - 1.78

Native concentration calculation

① Response of the native is compared to the average of all ISs used for that group. For the penta-chloros that would be the six ISs:

^{13}C - PeCB 104, 123, 118, 114, 105, 126

areas available on pgs 1062 + 1063

② Formula:

$$\text{concentration PeCB-113/90/101} = \frac{[\text{Total area PeCB113/90/101}][\text{amount IS added}]}{[\text{average IS area from ①}][\text{RRF}][\text{Sample Size}]}$$

Areas have been highlighted on the attached chromatograms.

$$\text{conc} = \frac{(23108)(2000)}{\left(\frac{360623 + 367061 + 394059 + 377580 + 335734 + 386906}{6}\right)(0.894)(5.06)}$$

$$= 27.66$$

Note: Minor difference from the result above and the 27.84 value on page 1051 is minor and due to the number of significant figures used and when the software does its rounding.

G2B080439

Dataset: \\Sacsvr01\instrument_data\ATG\12D5\Default.pro\21FE1212D81668A209totalsCvg.qld

Last Altered: Friday, February 24, 2012 12:06:18 Pacific Standard Time
Printed: Friday, February 24, 2012 12:10:51 Pacific Standard Time

317

Name: 21FE1212D8_35, Date: 23-Feb-2012, Time: 03:50:50, ID: MQN8C-1-AD, Description: G2B080439-7 RI 2045127 KSS

#	Name	Quan Trace	Sample Size	RT	Pred RT	RRT	IM	Abs Resp	pg	EMPC	%Rec	EDL	Ratio	Prd Ratio	Rat Flag	Mod Date
66	TeCB-56	289.92240	5.06000		32.53	0.806						0.5719		0.770		
67	TeCB-60	289.92240	5.06000		32.90	0.833						0.5535		0.770		
68	TeCB-80	289.92240	5.06000		33.39	0.959						0.4805		0.770		
69	TeCB-79	289.92240	5.06000		35.31	0.929						0.4961		0.770		
70	TeCB-78	289.92240	5.06000		35.94	0.795						0.5795		0.770		
71	TeCB-81	289.92240	5.06000		36.52	0.972						0.5166		0.770		
72	TeCB-77	289.92240	5.06000		37.25	0.936						0.5455		0.770		
73	Total TeCB	289.92240	5.06000		35.57	0.901		61.1342	59.8455 ✓	~~17.2083~~	0.54DL					
74																
75	PeCB-104	325.88040	5.06000		26.39	1.049						0.2197		1.550		
76	PeCB-96	325.88040	5.06000		26.81	1.194						0.2329		1.550		
77	PeCB-103	325.88040	5.06000		29.27	0.869						0.6093		1.550		
78	PeCB-94	325.88040	5.06000		29.56	0.748						0.7081		1.550		
79	PeCB-95	325.88040	5.06000	30.12	30.10	0.802	8370.71	11.2412	11.2412 J			0.6603	1.581	1.550	NO	
80	PeCB-100/93	325.88040	5.06000		30.37	0.834						0.6351	0.000	1.550	YES	24-Feb-12
81	PeCB-102/98	325.88040	5.06000		30.56	0.786						0.6734		1.550		
82	PeCB-88/91	325.88040	5.06000	31.24	31.13	0.808	1624.65	2.1642	2.1642 J			0.6550	1.735	1.550	NO	24-Feb-12
83	PeCB-84	325.88040	5.06000	31.49	31.48	0.694	1613.40	2.5050	2.2520 JQ			0.7635	1.205	1.550	YES	
84	PeCB-89	325.88040	5.06000		31.91	0.732						0.7233		1.550		
85	PeCB-121	325.88040	5.06000		32.62	1.081						0.4898		1.550		
86	PeCB-92	325.88040	5.06000	33.11	33.16	0.765	3948.74	5.5603	4.8072 JQ			0.6925	1.950	1.550	YES	
87	PeCB-113/90/101	325.88040	5.06000	33.86	33.98	0.894	23108.13	27.8401	27.8401 J			0.5924	1.616	1.550	NO	
88	PeCB-83	325.88040	5.06000		34.47	0.808						0.6552		1.550		
89	PeCB-99	325.88040	5.06000	34.59	34.61	0.900	16508.66	19.7484	19.7484 J			0.5882	1.683	1.550	NO	
90	PeCB-112	325.88040	5.06000		34.76	0.828						0.6394		1.550		
91	PeCB-108/119/86/97/12...	325.88040	5.06000	35.34	35.34	0.905	8245.42	9.8106	9.8106 J			0.5851	1.539	1.550	NO	24-Feb-12
92	PeCB-117/116/85	325.88040	5.06000	36.12	36.23	0.980	3659.67	4.0220	3.3625 JQ			0.5404	2.050	1.550	YES	
93	PeCB-110/115	325.88040	5.06000	36.36	36.37	0.986	17210.45	18.7907	18.7907 J			0.5369	1.633	1.550	NO	
94	PeCB-82	325.88040	5.06000		36.73	0.655						0.8080		1.550		
95	PeCB-111	325.88040	5.06000		37.31	1.075						0.4924		1.550		
96	PeCB-120	325.88040	5.06000		37.88	1.077						0.4919		1.550		
97	PeCB-107/124	325.88040	5.06000		39.25	1.029						0.5148		1.550		
98	PeCB-109	325.88040	5.06000	39.57	39.58	1.288	2737.03	2.2886	2.1058 JQ			0.4112	1.269	1.550	YES	
99	PeCB-123	325.88040	5.06000		39.71	1.098						0.4858		1.550		

Soil & Tissue Units = pg/g; Water Units = pg/L; Air & Waste Units = pg/Sample

TestAmerica West Sacramento (916) 373-5600

Dataset: M:\MassLynx\JAN2012.PRO\21FE1212D81668A209totalsC.qld

Last Altered: Thursday, February 23, 2012 12:57:47 Pacific Standard Time
Printed: Thursday, February 23, 2012 13:00:50 Pacific Standard Time

G2B080439

318

Name: 21FE1212D8_35, Date: 23-Feb-2012, Time: 03:50:50, ID: MQN8C-1-AD, Description: G2B080439-7 RI 2045127 KSS

#	Name	Quan Trace	Sample Size	RT	Pred RT	RRF	MF	Abs Resp	pg	EMPC	%Rec	EDL	Ratio	Rtd Ratio	Ratio	Mod Date
171	OcCB-197	427.76350	5.06000		49.73	1 239						0.2159		0.890		
172	OcCB-200	427.76350	5.06000		49.84	0.763						0.3503		0.890		
173	OcCB-198/199	427.76350	5.06000	53.38	53.32	0.715	8648.46	16.0575	16.0580	J		0.3740	0.797	0.890	NO	
174	OcCB-196	427.76350	5.06000	54.23	54.29	0.819	2721.98	4.4116	4.4120	J		0.3265	0.844	0.890	NO	
175	OcCB-203	427.76350	5.06000	54.47	54.53	0.730	1750.44	3.1828	3.1830	J		0.3663	0.820	0.890	NO	
176	OcCB-195	427.76350	5.06000		55.97	0.602						0.4329		0.890		
177	OcCB-194	427.76350	5.06000	58.03	58.00	0.621	1728.77	3.6959	3.6960	J		0.4198	0.911	0.890	NO	
178	OcCB-205	427.76350	5.06000		58.46	0.908						0.3141		0 890		
179	Total OcCB	427.76350	5.06000		57.25	0.850		31.7673	31.5630			~~3.6007~~	0.3 IDL.			
180																
181	NoCB-208	461.72450	5.06000	55.73	55.72	0.953	3395.54	5.0150	5.0150	J		0.6430	0.842	0.770	NO	
182	NoCB-207	461.72450	5.06000	56.54	56.49	1.157	1550.52	2.3847	1.9830	JQ		0.6994	0.567	0.770	YES	
183	NoCB-206	461.72450	5.06000	60.15	60.17	1.021	2092.06	4.9575	3.6210			1.1234	1.423	0.770	YES	
184	Total NoCB	461.72450	5.06000		58.86	1.044		12.3572	10.6190			~~2.4658~~	1.12DL			
185																
186	DeCB-209	497.68260	5.06000	61.85	61.89	1.118	2696.69	5.2794	4.4900	JQ		0.3390	1.540	1.160	YES	
187																
188	13C-MoCB-1	200.07950	5.06000	8.89	8.91	1.247	455622 48	213.9873	198.3990	54.1		1.4223	2.285	3.130	YES	
189	13C-MoCB-3	200.07950	5.06000	11.54	11.54	1.201	447658.02	218.2635	218.2630	55.2		1.4765	2.744	3.130	NO	
190																
191	13C-DiCB-4	234.04060	5.06000	11.81	11.84	0.935	295157.62	184.9896	184.9900	46.8		0.3446	1.565	1.560	NO	
192	13C-DiCB-15	234.04060	5.06000	19.14	19.12	1.008	455547.50	264.7044	264.7040	67.0		0.5202	1.435	1.560	NO	
193																
194	13C-TrCB-19	268.00160	5.06000	15.65	15.65	0.726	269925.67	217.6777	217.6780	55.1		2.4665	0.984	1.040	NO	
195	13C-TrCB-37	268.00160	5.06000	27.97	27.91	1.147	411779.27	324.2838	324.2840	82.0		3.3883	1.033	1.040	NO	
196																
197	13C-TeCB-54	301.96260	5.06000	19.46	19.48	1.496	329921.97	199.1743	199.1740	50.4		0.4026	0.746	0.770	NO	
198	13C-TeCB-81	301.96260	5.06000	36.50	36.42	0.998	368610.09	333.4799	333.4800	84.4		0.8910	0.720	0.770	NO	
199	13C-TeCB-77	301.96260	5.06000	37.21	37.09	1.028	390841.64	343.2644	343.2640	86.8		0.8650	0.771	0.770	NO	
200																
201	13C-PeCB-104	337.9207	5.06000	26.34	26.38	1.557	360623.56	256.2600	256.2600	64.8		0.3510	1.525	1.550	NO	
202	13C-PeCB-123	337.9207	5.06000	39.67	39.66	1.153	367061.42	352.1609	352.1610	89.1		0.9299	1.534	1.550	NO	
203	13C-PeCB-118	337.9207	5.06000	40.09	40.06	1.210	394059.81	360.2882	360.2880	91.2		0.8862	1.536	1.550	NO	
204	13C-PeCB-114	337.9207	5.06000	40.75	40.73	1.201	377580.05	347.8189	347.8190	88.0		0.8928	1.575	1.550	NO	

Soil & Tissue Units = pg/g; Water Units = pg/L; Air & Waste Units = pg/Sample

TestAmerica West Sacramento (916) 373-5600

Dataset: M:\MassLynx\JAN2012.PRO\21FE1212D81668A209totalsC.qld

Last Altered: Thursday, February 23, 2012 12:57:47 Pacific Standard Time
Printed: Thursday, February 23, 2012 13:00:50 Pacific Standard Time

Name: 21FE1212D8_35, Date: 23-Feb-2012, Time: 03:50:50, ID: MQN8C-1-AD, Description: G2B080439-7 RI 2045127 KSS

	Name	Quan Trace	Sample Size	RT	Pred RT	RRF	M	Abs Resp	pg	EMPC	%Rec	EDL	Ratio	Prd Ratio	Ratio	Mod	Date
205	13C-PeCB-105	337.9207	5.06000	41.57	41.55	1.190		335734.70	312.1877	312.1880	79.0	0.9012	1.547	1.550	NO		
206	13C-PeCB-126	337.9207	5.06000	45.47	45.42	1.213		380906.53	347.1928	347.1930	87.8	0.8834	1.561	1.550	NO		
207																	
208	13C-HxCB-155	371.88170	5.06000	33.51	33.55	1.412		399840.64	323.9693	323.9690	82.0	0.3485	1.207	1.240	NO		
209	13C-HxCB-167	371.88170	5.06000	47.76	47.77	0.953		355437.81	426.4360	426.4360	107.9	1.6063	1.173	1.240	NO		
210	13C-HxCB-156/157	371.88170	5.06000	49.21	49.18	0.920		708411.66	880.5600	880.5600	111.4	1.6642	1.212	1 240	NO		
211	13C-HxCB-169	371.88170	5.06000	53.30	53.25	0.862		314309.61	416.9094	416.9090	105.5	1.7759	1.245	1.240	NO		
212																	
213	13C-HpCB-188	405.84280	5.06000	40.70	40.76	2.075		383664.56	418.4245	418.4250	105.9	0.3486	0 998	1.050	NO		
214	13C-HpCB-189	405.84280	5.06000	56.19	56.20	1.249		266091.35	482.0379	482.0380	122.0	0.7551	1.036	1.050	NO		
215																	
216	13C-OcCB-202	439.80380	5.06000	47.40	47.49	1.865		358348.08	434.8268	434.8270	110.0	0.3389	0.892	0.890	NO		
217	13C-OcCB-205	439.80380	5.06000	58.44	58.42	1.416		237009.49	378.7953	378.7950	95.8	0.7552	0.863	0.890	NO		
218																	
219	13C-NoCB-208	473.76480	5.06000	55.71	55.76	1.424		280858.08	446.2980	446.2980	112.9	0.4921	0.763	0.770	NO		
220	13C-NoCB-206	473.76480	5.06000	60.13	60.13	0.974		163292.42	379.3847	379.3850	96.0	0.7195	0.743	0.770	NO		
221																	
222	13C-DeCB-209	509.7229	5.06000	61.85	61.87	1.186		180617.27	344.7380	344.7380	87.2	0.5136	1.174	1.160	NO		
223																	
224	13C-DiCB-9	234.04060	5.06000	14.25	14.27	1.501		337398.19	257.1564	257.1560	130.1	1.0976	1.470	1.560	NO		
225	13C-TeCB-52	301.96260	5.06000	25.16	25.20	0.997		218835.95	251.0531	251.0530	127.0	0.9345	0.798	0.770	NO		
226	13C-PeCB-101	337.9207	5.06000	33.82	33.84	0.881		178675.69	231.8917	231.8920	117.3	1.3234	1.553	1.550	NO		
227	13C-HxCB-138	371.88170	5.06000	43.98	43.93	1.000		172795.69	197.6285	197.6280	100.0	0.4919	1.279	1.240	NO		
228	13C-OcCB-194	439.80380	5.06000	58.00	57.96	0.664		87329.50	150.4399	150.4400	76.1	0.9949	0.889	0.890	NO		
229																	
230	13C-TrCB-28	268.00160	5.06000	22.91	22.88	1.195		419943.23	317.4898	317.4900	80.3	3.2528	1.002	1.040	NO		
231	13C-PeCB-111	337.9207	5.06000	37.21	37.20	1.244		388071.00	344.9156	344.9160	87.3	0.8614	1.584	1.550	NO		
232	13C-HpCB-178	405.84280	5.06000	44.52	44.56	0 868		259090 31	341.4010	341.4010	86.4	0.5148	1.005	1.050	NO		
233																	
234	Function 1 PFK	218.986	1.00000	11.30	11 35	21723....		33372.28	1.5362		153.6	3.2175					
235	Function 2 PFK	242 9856	1.00000	18.24	18.26	17406....		23961.25	1.3766		137.7	3.4675					
236	Function 3 PFK	280.9825	1.00000		22.55	32746....											
237	Function 4 PFK	330.9792	1.00000		37.34												
238	Function 5 PFK	354.9792	1.00000		45.63												

Soil & Tissue Units = pg/g; Water Units = pg/L; Air & Waste Units = pg/Sample

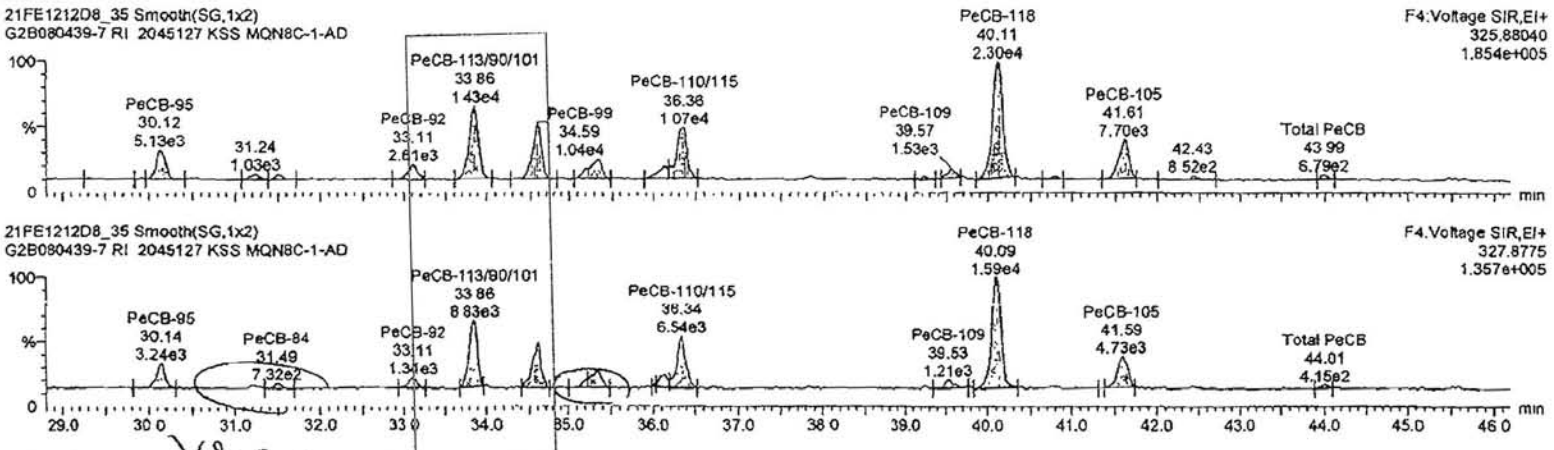
Quantify Sample Report **MassLynx 4.1 SCN 714 Desktop**

Dataset: M:\MassLynx\JAN2012.PRO\21FE1212D81668A209totalsC.qld

Last Altered: Thursday, February 23, 2012 12:20:50 Pacific Standard Time
Printed: Thursday, February 23, 2012 12:51:49 Pacific Standard Time

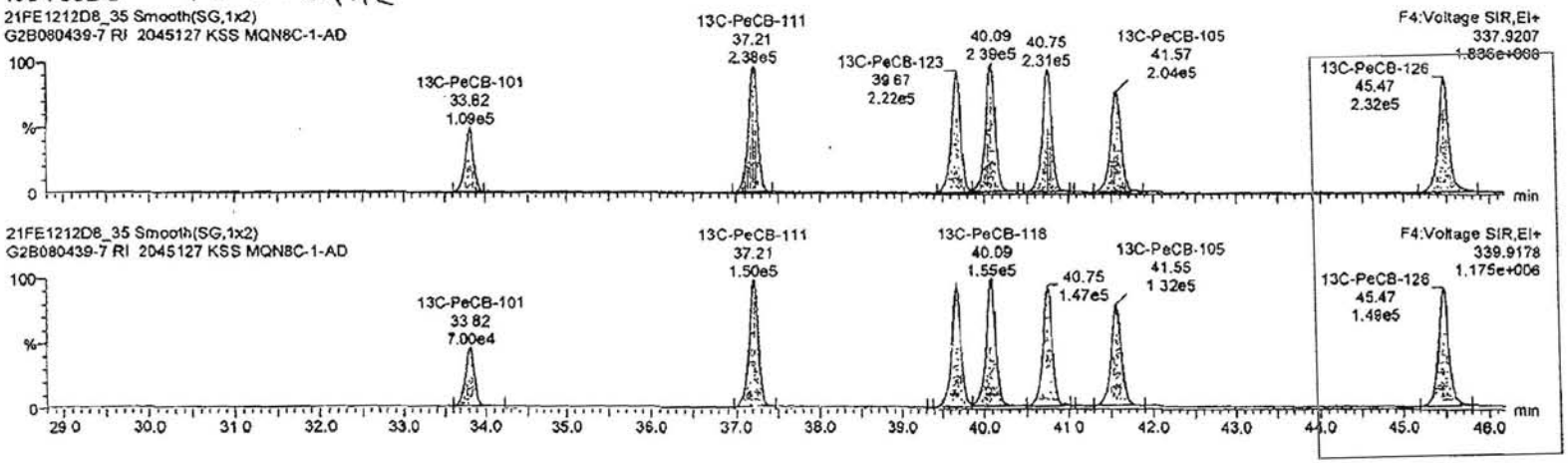
Name: 21FE1212D8_35, Date: 23-Feb-2012, Time: 03:50:50, ID: MQN8C-1-AD, Description: G2B080439-7 RI 2045127 KSS

PeCBs



VS 2.24.12

13C-PeCB-s



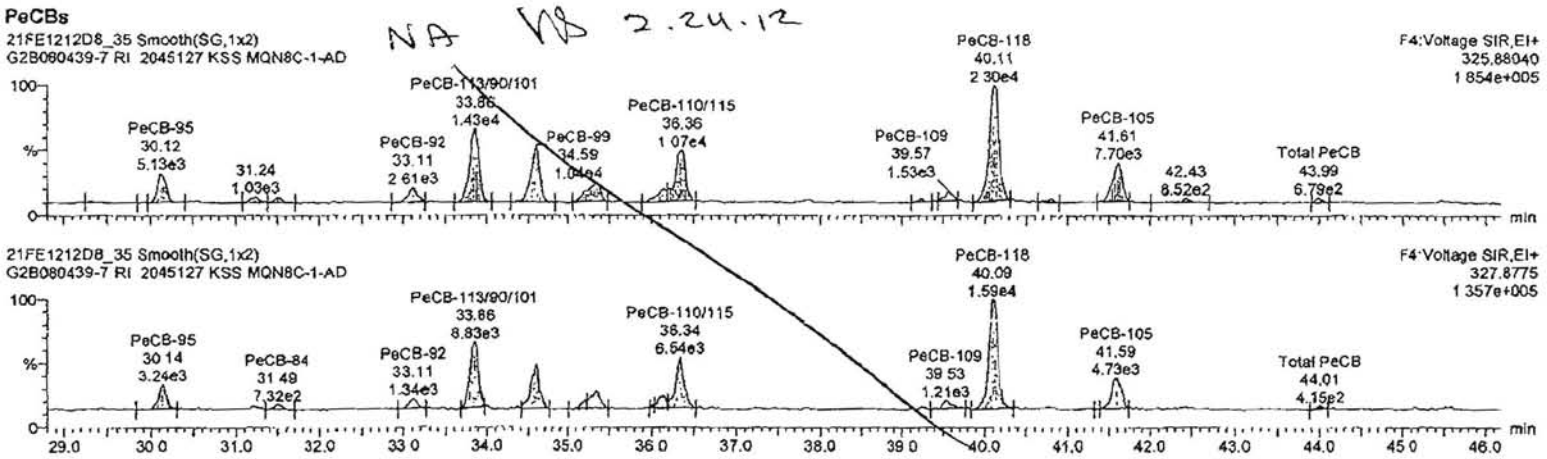
Quantify Sample Report **MassLynx 4.1 SCN 714 Desktop**

Dataset: M:\MassLynx\JAN2012.PRO\21FE1212D81668A209totalsC.qld

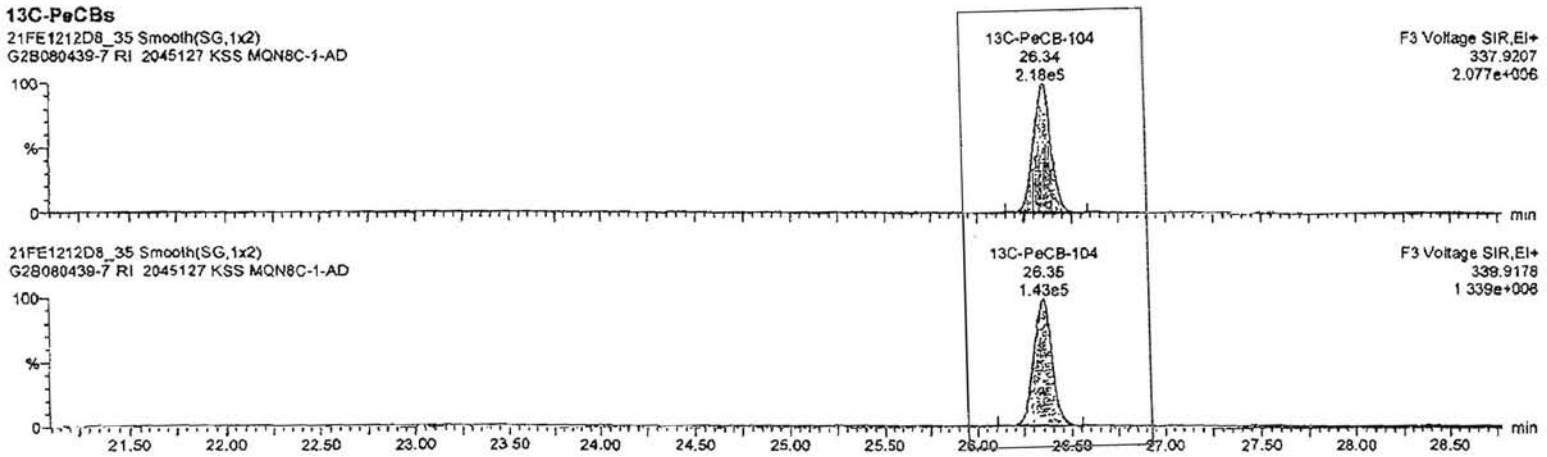
Last Altered: Thursday, February 23, 2012 12:20:50 Pacific Standard Time
Printed: Thursday, February 23, 2012 12:51:49 Pacific Standard Time

Name: 21FE1212D8_35, Date: 23-Feb-2012, Time: 03:50:50, ID: MQN8C-1-AD, Description: G2B080439-7 RI 2045127 KSS

PeCBs



13C-PeCBs



Dataset: M:\MassLynx\JAN2012.PRO\21FE1212D81668A209totalsC.qld

Last Altered: Thursday, February 23, 2012 12:57:47 Pacific Standard Time
Printed: Thursday, February 23, 2012 12:59:03 Pacific Standard Time

Predicted Ion Ratio

Method: M:\MassLynx\JAN2012.PRO\MethDB\1668A209EPA12D8_RRT_1223201totalsum.mdb 20 Feb 2012 14:15:22
Calibration: M:\MassLynx\JAN2012.PRO\CurveDB\ICA0909201112D81668A209totals.cdb 13 Sep 2011 15:09:22

Actual Calculated Ion Ratio

Name: 21FE1212D8_31, Date: 22-Feb-2012, Time: 23:04:01, ID: ST0221C, Description: CS-3 209 (50) 12DXN003 KSS

#	Name	Trace	Response	Std Conc	RT	PrRT	RRFMean	RRF	%Dev	PrRatio	AcRat	RatioFL	Mod
1	MoCB-1	188.0...	542533	50.000	8.91	8.89	0.80611	0.77137	-4.3	3.130	2.930	NO	
2	MoCB-2	188.0...	563124	50.000	11.31	11.39	0.80729	0.79282	-1.8	3.130	2.926	NO	
3	MoCB-3	188.0...	567333	50.000	11.54	11.53	0.82068	0.79101	-3.6	3.130	2.917	NO	
4	Total MoCB	188.0...		50.000		10.76	0.81136						
5				0.000									
6	DiCB-4	222.0...	419950	50.000	11.82	11.81	0.91998	0.90672	-1.4	1.560	1.495	NO	
7	DICB-10	222.0...	614184	50.000	12.06	12.05	1.18426	1.11797	-5.6	1.560	1.516	NO	
8	DICB-9	222.0...	472052	50.000	14.25	14.21	0.79053	0.85925	8.7	1.560	1.397	NO	23-Fe...
9	DiCB-7	222.0...	530360	50.000	14.46	14.41	0.89026	0.96539	8.4	1.560	1.426	NO	23-Fe...
10	DiCB-6	222.0...	495031	50.000	14.76	14.76	0.84276	0.90108	6.9	1.560	1.440	NO	23-Fe...
11	DiCB-5	222.0...	504474	50.000	15.13	15.11	0.85861	0.91827	6.9	1.560	1.408	NO	23-Fe...
12	DICB-8	222.0...	516985	50.000	15.30	15.26	0.84641	0.94104	11.2	1.560	1.407	NO	23-Fe...
13	DiCB-14	222.0...	600582	50.000	17.32	17.30	0.97333	1.09321	12.3	1.560	1.408	NO	
14	DICB-11	222.0...	516587	50.000	18.37	18.37	0.81864	0.94032	14.9	1.560	1.431	NO	
15	DICB-13/12	222.0...	1011275	100.000	18.76	18.80	0.81827	0.92039	12.5	1.560	1.425	NO	
16	DiCB-15	222.0...	529556	50.000	19.15	19.16	0.84791	0.83316	-1.7	1.560	1.460	NO	
17	Total DiCB	222.0...		50.000		17.97	0.89009						
18				0.000									
19	TrCB-19	255.9...	590740	50.000	15.65	15.64	1.02356	0.97909	-4.3	1.040	1.013	NO	
20	TrCB-30/18	255.9...	1050092	100.000	17.95	17.86	1.30108	1.18000	-9.3	1.040	1.023	NO	
21	TrCB-17	255.9...	440177	50.000	18.48	18.50	1.09890	0.98926	-10.0	1.040	1.003	NO	
22	TrCB-27	255.9...	584660	50.000	18.75	18.75	1.48147	1.31397	-11.3	1.040	1.011	NO	
23	TrCB-24	255.9...	582426	50.000	18.92	18.91	1.42925	1.30895	-8.4	1.040	1.059	NO	
24	TrCB-16	255.9...	350950	50.000	19.06	18.98	0.89822	0.78873	-12.2	1.040	0.926	NO	
25	TrCB-32	255.9...	633324	50.000	19.70	19.62	1.54696	1.42334	-8.0	1.040	0.985	NO	
26	TrCB-34	255.9...	461996	50.000	21.28	21.27	0.98398	1.03830	5.5	1.040	0.945	NO	
27	TrCB-23	255.9...	486646	50.000	21.46	21.47	1.01681	1.09369	7.6	1.040	0.957	NO	
28	TrCB-26/29	255.9...	955241	100.000	21.87	21.80	1.00508	1.07341	6.8	1.040	0.955	NO	
29	TrCB-25	255.9...	489580	50.000	22.15	22.20	0.98450	1.10029	11.8	1.040	0.955	NO	
30	TrCB-31	255.9...	486700	50.000	22.53	22.58	1.03876	1.09382	5.3	1.040	0.941	NO	
31	TrCB-28/20	255.9...	909427	100.000	22.92	22.93	0.97442	1.02193	4.9	1.040	0.946	NO	
32	TrCB-21/33	255.9...	960078	100.000	23.17	23.19	1.02261	1.07885	5.5	1.040	0.958	NO	
33	TrCB-22	255.9...	441227	50.000	23.70	23.72	0.93470	0.99162	6.1	1.040	0.955	NO	
34	TrCB-36	255.9...	474043	50.000	25.67	25.73	1.06533	1.06537	0.0	1.040	0.955	NO	
35	TrCB-39	255.9...	495908	50.000	26.12	26.17	1.03959	1.11451	7.2	1.040	0.967	NO	
36	TrCB-38	255.9...	438941	50.000	26.85	26.89	0.93570	0.98648	5.4	1.040	0.956	NO	
37	TrCB-35	255.9...	429814	50.000	27.46	27.46	0.93175	0.96597	3.7	1.040	0.957	NO	
38	TrCB-37	255.9...	430785	50.000	27.97	27.97	0.97531	0.87767	-10.0	1.040	0.929	NO	
39	Total TrCB	255.9...		50.000		26.51	1.08440						
40				0.000									
41	TeCB-54	289.9...	468555	50.000	19.48	19.47	1.04449	0.98407	-5.8	0.770	0.719	NO	
42	TeCB-50/53	289.9...	827655	100.000	22.19	22.24	0.89145	0.94651	6.2	0.770	0.761	NO	
43	TeCB-45	289.9...	341858	50.000	23.00	22.99	0.71749	0.78190	9.0	0.770	0.764	NO	
44	TeCB-51	289.9...	416867	50.000	23.09	23.10	0.94495	0.95346	0.9	0.770	0.781	NO	
45	TeCB-46	289.9...	329225	50.000	23.39	23.37	0.72572	0.75301	3.8	0.770	0.767	NO	
46	TeCB-52	289.9...	378429	50.000	25.19	25.14	0.83266	0.86554	3.9	0.770	0.775	NO	

First Eluter of Congener Group (Di-substitued)

Last Eluter of Congener Group (Di- Substituted)

Break between congener groups/descriptors

TEF FACTORS & TEQ RESULTS

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.2	J Q	20		
PCB 2 (BZ)	2.0 U	J Q	20		
PCB 3 (BZ)	0.89	J	20		
PCB 4 (BZ)	9.7	J	20		
PCB 5 (BZ)	9.9 U		20		
PCB 6 (BZ)	7.2	J	20		
PCB 7 (BZ)	9.9 U		20		
PCB 8 (BZ)	24		20		
PCB 9 (BZ)	9.9 U		20		
PCB 10 (BZ)	9.9 U		20		
PCB 11 (BZ)	16	J B	20		
PCB 12 (BZ)	20 U		40		
PCB 13 (BZ)	20 U		40		
PCB 14 (BZ)	9.9 U		20		
PCB 15 (BZ)	9.9 U		20		
PCB 16 (BZ)	5.9	J	20		
PCB 17 (BZ)	9.3	J	20		
PCB 18 (BZ)	26	C J B	40		
PCB 19 (BZ)	9.8	J	20		
PCB 20 (BZ)	230	C B	40		
PCB 21 (BZ)	23	C J B	40		
PCB 22 (BZ)	31		20		
PCB 23 (BZ)	0.99 U		20		
PCB 24 (BZ)	0.99 U		20		
PCB 25 (BZ)	12	J	20		
PCB 26 (BZ)	34	C J	40		
PCB 27 (BZ)	3.5	J	20		
PCB 28 (BZ)	230	C B	40		
PCB 29 (BZ)	34	C J	40		
PCB 30 (BZ)	26	C J B	40		
PCB 31 (BZ)	140	B	20		
PCB 32 (BZ)	23	B	20		
PCB 33 (BZ)	23	C J B	40		
PCB 34 (BZ)	2.2	J Q	20		
PCB 35 (BZ)	2.0 U		20		
PCB 36 (BZ)	15	J	20		
PCB 37 (BZ)	3.1	J B	20		

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.99 U		20		
PCB 39 (BZ)	0.99 U		20		
PCB 40 (BZ)	31	C J	40		
PCB 41 (BZ)	0.99 U		20		
PCB 42 (BZ)	9.5	J	20		
PCB 43 (BZ)	0.99 U		20		
PCB 44 (BZ)	420	C B	60		
PCB 45 (BZ)	13	J	20		
PCB 46 (BZ)	3.3	J Q	20		
PCB 47 (BZ)	420	C B	60		
PCB 48 (BZ)	2.5	J Q	20		
PCB 49 (BZ)	520	C B	40		
PCB 50 (BZ)	43	C	40		
PCB 51 (BZ)	8.8	J	20		
PCB 52 (BZ)	1900	B	20		
PCB 53 (BZ)	43	C	40		
PCB 54 (BZ)	3.2	J	20		
PCB 55 (BZ)	2.0 U		20		
PCB 56 (BZ)	37		20		
PCB 57 (BZ)	33		20		
PCB 58 (BZ)	0.99 U		20		
PCB 59 (BZ)	52	C J	60		
PCB 60 (BZ)	160		20		
PCB 61 (BZ)	2300	C B	80		
PCB 62 (BZ)	52	C J	60		
PCB 63 (BZ)	57		20		
PCB 64 (BZ)	170		20		
PCB 65 (BZ)	420	C B	60		
PCB 66 (BZ)	1300		20		
PCB 67 (BZ)	13	J	20		
PCB 68 (BZ)	23		20		
PCB 69 (BZ)	520	C B	40		
PCB 70 (BZ)	2300	C B	80		
PCB 71 (BZ)	31	C J	40		
PCB 72 (BZ)	28		20		
PCB 73 (BZ)	0.99 U		20		
PCB 74 (BZ)	2300	C B	80		

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	52	C J	60		
PCB 76 (BZ)	2300	C B	80		
PCB 77 (BZ)	15		2.0	0.0001	0.0015
PCB 78 (BZ)	0.99 U		20		
PCB 79 (BZ)	19	J	20		
PCB 80 (BZ)	0.99 U		20		
PCB 81 (BZ)	0.99 U		2.0	0.0003	0.00030
PCB 82 (BZ)	16	J	20		
PCB 83 (BZ)	0.99 U		20		
PCB 84 (BZ)	97		20		
PCB 85 (BZ)	930	C	60		
PCB 86 (BZ)	710	C	120		
PCB 87 (BZ)	710	C	120		
PCB 88 (BZ)	180	C	40		
PCB 89 (BZ)	0.99 U		20		
PCB 90 (BZ)	3800	C B	60		
PCB 91 (BZ)	180	C	40		
PCB 92 (BZ)	880		20		
PCB 93 (BZ)	27	C J	40		
PCB 94 (BZ)	0.99 U		20		
PCB 95 (BZ)	780	B	20		
PCB 96 (BZ)	3.3	J	20		
PCB 97 (BZ)	710	C	120		
PCB 98 (BZ)	2.2	C J Q	40		
PCB 100 (BZ)	27	C J	40		
PCB 101 (BZ)	3800	C B	60		
PCB 102 (BZ)	2.2	C J Q	40		
PCB 103 (BZ)	27		20		
PCB 104 (BZ)	0.99 U		20		
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	550		20		
PCB 108 (BZ)/107 (IUPAC)	210	C	40		
PCB 109 (BZ)/108 (IUPAC)	710	C	120		
PCB 110 (BZ)	1200	C B	40		
PCB 111 (BZ)	6.5	J	20		
PCB 112 (BZ)	0.99 U		20		
PCB 113 (BZ)	3800	C B	60		

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 114 (BZ)	170		2.0	0.00003	0.0051
PCB 115 (BZ)	1200	C B	40		
PCB 116 (BZ)	930	C	60		
PCB 117 (BZ)	930	C	60		
PCB 119 (BZ)	710	C	120		
PCB 120 (BZ)	42		20		
PCB 121 (BZ)	2.7	J	20		
PCB 122 (BZ)	0.99 U		20		
PCB 123 (BZ)	82		2.0	0.00003	0.0025
PCB 124 (BZ)	210	C	40		
PCB 125 (BZ)	710	C	120		
PCB 126 (BZ)	26		2.0	0.1	2.6
PCB 127 (BZ)	13	J	20		
PCB 128 (BZ)	990	C	40		
PCB 130 (BZ)	320		20		
PCB 131 (BZ)	3.9	J	20		
PCB 132 (BZ)	120		20		
PCB 133 (BZ)	63		20		
PCB 134 (BZ)	14	C J	40		
PCB 135 (BZ)	320	C	40		
PCB 136 (BZ)	48		20		
PCB 137 (BZ)	240		20		
PCB 139 (BZ)	100	C	40		
PCB 140 (BZ)	100	C	40		
PCB 141 (BZ)	580		20		
PCB 142 (BZ)	0.99 U		20		
PCB 143 (BZ)	14	C J	40		
PCB 144 (BZ)	76		20		
PCB 145 (BZ)	0.99 U		20		
PCB 146 (BZ)	960		20		
PCB 147 (BZ)	390	C	40		
PCB 148 (BZ)	4.2	J	20		
PCB 149 (BZ)	390	C	40		
PCB 150 (BZ)	1.0	J Q	20		
PCB 151 (BZ)	320	C	40		
PCB 152 (BZ)	0.99 U		20		
PCB 154 (BZ)	61		20		

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 155 (BZ)	1.8	J Q	20		
PCB 156 (BZ)	1500	C	4.0	0.00003	0.045
PCB 157 (BZ)	1500	C	4.0	0.00003	0.045
PCB 158 (BZ)	790		20		
PCB 159 (BZ)	0.99 U		20		
PCB 160 (BZ)	0.99 U		20		
PCB 161 (BZ)	0.99 U		20		
PCB 162 (BZ)	58		20		
PCB 164 (BZ)	87	Q	20		
PCB 165 (BZ)	0.99 U		20		
PCB 166 (BZ)	990	C	40		
PCB 167 (BZ)	500		2.0	0.00003	0.015
PCB 169 (BZ)	0.99 U		2.0	0.03	0.030
PCB 170 (BZ)	1000		20		
PCB 171 (BZ)	300	C	40		
PCB 172 (BZ)	190		20		
PCB 173 (BZ)	300	C	40		
PCB 174 (BZ)	49		20		
PCB 175 (BZ)	20	J	20		
PCB 176 (BZ)	5.1	J	20		
PCB 177 (BZ)	280		20		
PCB 178 (BZ)	56		20		
PCB 179 (BZ)	14	J	20		
PCB 180 (BZ)	1700	C	40		
PCB 181 (BZ)	27		20		
PCB 182 (BZ)	4.7	J	20		
PCB 183 (BZ)	450		20		
PCB 184 (BZ)	0.99 U		20		
PCB 185 (BZ)	39		20		
PCB 186 (BZ)	0.99 U		20		
PCB 187 (BZ)	730		20		
PCB 188 (BZ)	4.5	J	20		
PCB 189 (BZ)	35	B	2.0	0.00003	0.0010
PCB 190 (BZ)	8.7	J	20		
PCB 191 (BZ)	43		20		
PCB 192 (BZ)	0.99 U		20		
PCB 193 (BZ)	1700	C	40		

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	Work Order #....:	MQN741AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.01 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 194 (BZ)	150		20		
PCB 195 (BZ)	65		20		
PCB 196 (BZ)	75		20		
PCB 197 (BZ)	7.6	J	20		
PCB 198 (BZ)	230	C	40		
PCB 199 (BZ)/200 (IUPAC)	1.4	J	20		
PCB 200 (BZ)/201 (IUPAC)	24		20		
PCB 201 (BZ)/199 (IUPAC)	230	C	40		
PCB 202 (BZ)	37		20		
PCB 203 (BZ)	160		20		
PCB 204 (BZ)	0.99 U		20		
PCB 205 (BZ)	6.3	J	20		
PCB 206 (BZ)	61		20		
PCB 207 (BZ)	10	J	20		
PCB 208 (BZ)	24		20		
PCB 209 (BZ)	21		20		
Monochlorobiphenyl (total)	4.1		20		
Dichlorobiphenyl (total)	57		20		
Trichlorobiphenyl (total)	570		20		
Tetrachlorobiphenyl (total)	7200		20		
Pentachlorobiphenyl (total)	25000		20		
Hexachlorobiphenyl (total)	21000		20		
Heptachlorobiphenyl (total)	5000		20		
Octachlorobiphenyl (total)	760		20		
Nonachlorobiphenyl (total)	96		20		
Total TEQ Concentration					2.7

329

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	**Work Order #....:**	MQN741AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.99	**Units.....:**	pg/g
Initial Wgt/Vol :	10.01 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 1	46	5.0 - 145
13C12-PCB 3	47	5.0 - 145
13C12-PCB 4	31	5.0 - 145
13C12-PCB 15	65	5.0 - 145
13C12-PCB 19	37	5.0 - 145
13C12-PCB 37	89	5.0 - 145
13C12-PCB 54	35	5.0 - 145
13C12-PCB 77	88	10 - 145
13C12-PCB 81	90	10 - 145
13C12-PCB 104	49	10 - 145
13C12-PCB 105	78	10 - 145
13C12-PCB 114	79	10 - 145
13C12-PCB 118	78	10 - 145
13C12-PCB 123	79	10 - 145
13C12-PCB 126	74	10 - 145
13C12-PCB 155	79	10 - 145
13C12-PCB 156	143	10 - 145
13C12-PCB 157	143	10 - 145
13C12-PCB 167	143	10 - 145
13C12-PCB 169	130	10 - 145
13C12-PCB 188	73	10 - 145
13C12-PCB 189	128	10 - 145
13C12-PCB 202	90	10 - 145
13C12-PCB 205	88	10 - 145
13C12-PCB 206	80	10 - 145
13C12-PCB 208	95	10 - 145
13C12-PCB 209	68	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	87	5.0 - 145
13C12-PCB 178	71	10 - 145
13C12-PCB 111	79	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	**Work Order #....:**	MQN741AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.99	**Units.....:**	pg/g
Initial Wgt/Vol :	10.01 g	**Analyst ID....:**	Sylvia H. Krenn		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 001	**Work Order #....:**	MQN742AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	4.99	**Units.....:**	pg/g
Initial Wgt/Vol :	10.01 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 99 (BZ)	**3800**		**100**		
PCB 105 (BZ)	**2500**	**B**	**10**	**0.00003**	**0.075**
PCB 118 (BZ)	**8200**	**B**	**10**	**0.00003**	**0.25**
PCB 129 (BZ)	**9100**	**C**	**300**		
PCB 138 (BZ)	**9100**	**C**	**300**		
PCB 153 (BZ)	**7400**	**C**	**200**		
PCB 163 (BZ)	**9100**	**C**	**300**		
PCB 168 (BZ)	7400	**C**	**200**		

Total TEQ Concentration **0.32**

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 104	61		10 - 145
13C12-PCB 105	80		10 - 145
13C12-PCB 114	80		10 - 145
13C12-PCB 118	82		10 - 145
13C12-PCB 123	80		10 - 145
13C12-PCB 126	84		10 - 145
13C12-PCB 155	73		10 - 145
13C12-PCB 156	105	C	10 - 145
13C12-PCB 157	105	C	10 - 145
13C12-PCB 167	100		10 - 145
13C12-PCB 169	102		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	77	5.0 - 145
13C12-PCB 178	81	10 - 145
13C12-PCB 111	82	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	**Work Order #....:**	MQN751AD	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID.....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.94	**Units.....:**	pg/g
Initial Wgt/Vol :	10.54 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.8	J	19		
PCB 2 (BZ)	1.9 U	J Q	19		
PCB 3 (BZ)	0.91	J Q	19		
PCB 4 (BZ)	12	J	19		
PCB 5 (BZ)	9.4 U		19		
PCB 6 (BZ)	8.4	J Q	19		
PCB 7 (BZ)	9.4 U		19		
PCB 8 (BZ)	25		19		
PCB 9 (BZ)	9.4 U		19		
PCB 10 (BZ)	9.4 U		19		
PCB 11 (BZ)	25	B	19		
PCB 12 (BZ)	19 U	C J	38		
PCB 13 (BZ)	19 U	C J	38		
PCB 14 (BZ)	9.4 U		19		
PCB 15 (BZ)	9.4 U	J	19		
PCB 16 (BZ)	6.9	J Q	19		
PCB 17 (BZ)	11	J	19		
PCB 18 (BZ)	28	C J B	38		
PCB 19 (BZ)	11	J	19		
PCB 20 (BZ)	260	C B	38		
PCB 21 (BZ)	26	C J B	38		
PCB 22 (BZ)	35		19		
PCB 23 (BZ)	0.94 U		19		
PCB 24 (BZ)	0.94 U		19		
PCB 25 (BZ)	13	J	19		
PCB 26 (BZ)	39	C	38		
PCB 27 (BZ)	3.3	J Q	19		
PCB 28 (BZ)	260	C B	38		
PCB 29 (BZ)	39	C	38		
PCB 30 (BZ)	28	C J B	38		
PCB 31 (BZ)	160	B	19		
PCB 32 (BZ)	26	B	19		
PCB 33 (BZ)	26	C J B	38		
PCB 34 (BZ)	1.5	J Q	19		
PCB 35 (BZ)	1.9 U		19		
PCB 36 (BZ)	17	J	19		
PCB 37 (BZ)	3.5	J B	19		

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.94	Units.....:	pg/g
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.94 U		19		
PCB 39 (BZ)	0.94 U		19		
PCB 40 (BZ)	29	C J	38		
PCB 41 (BZ)	0.94 U		19		
PCB 42 (BZ)	9.5	J	19		
PCB 43 (BZ)	0.94 U		19		
PCB 44 (BZ)	440	C B	57		
PCB 45 (BZ)	17	J	19		
PCB 46 (BZ)	3.8	J	19		
PCB 47 (BZ)	440	C B	57		
PCB 48 (BZ)	1.8	J Q	19		
PCB 49 (BZ)	560	C B	38		
PCB 50 (BZ)	47	C	38		
PCB 51 (BZ)	7.7	J	19		
PCB 53 (BZ)	47	C	38		
PCB 54 (BZ)	3.8	J	19		
PCB 55 (BZ)	1.9 U		19		
PCB 56 (BZ)	39		19		
PCB 57 (BZ)	31	Q	19		
PCB 58 (BZ)	0.94 U		19		
PCB 59 (BZ)	54	C J	57		
PCB 60 (BZ)	180		19		
PCB 61 (BZ)	2400	C B	76		
PCB 62 (BZ)	54	C J	57		
PCB 63 (BZ)	62		19		
PCB 64 (BZ)	180		19		
PCB 65 (BZ)	440	C B	57		
PCB 66 (BZ)	1400		19		
PCB 67 (BZ)	15	J	19		
PCB 68 (BZ)	22	Q	19		
PCB 69 (BZ)	560	C B	38		
PCB 70 (BZ)	2400	C B	76		
PCB 71 (BZ)	29	C J	38		
PCB 72 (BZ)	32		19		
PCB 73 (BZ)	0.94 U		19		
PCB 74 (BZ)	2400	C B	76		
PCB 75 (BZ)	54	C J	57		

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.94	Units.....:	pg/g
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 76 (BZ)	2400	C B	76		
PCB 77 (BZ)	17		1.9	0.0001	0.0017
PCB 78 (BZ)	0.94 U		19		
PCB 79 (BZ)	21	Q	19		
PCB 80 (BZ)	0.94 U		19		
PCB 81 (BZ)	2.8	Q	1.9	0.0003	0.00084
PCB 82 (BZ)	15	J Q	19		
PCB 83 (BZ)	0.94 U		19		
PCB 84 (BZ)	110		19		
PCB 85 (BZ)	1100	C	57		
PCB 86 (BZ)	820	C	110		
PCB 87 (BZ)	820	C	110		
PCB 88 (BZ)	190	C	38		
PCB 89 (BZ)	0.94 U		19		
PCB 90 (BZ)	4300	C B	57		
PCB 91 (BZ)	190	C	38		
PCB 92 (BZ)	990		19		
PCB 93 (BZ)	30	C J	38		
PCB 94 (BZ)	2.1	J Q	19		
PCB 95 (BZ)	850	B	19		
PCB 96 (BZ)	3.9	J	19		
PCB 97 (BZ)	820	C	110		
PCB 98 (BZ)	1.9 U		38		
PCB 100 (BZ)	30	C J	38		
PCB 101 (BZ)	4300	C B	57		
PCB 102 (BZ)	1.9 U		38		
PCB 103 (BZ)	29		19		
PCB 104 (BZ)	0.94 U		19		
PCB 106 (BZ)	1.9 U		19		
PCB 107 (BZ)/109 (IUPAC)	630		19		
PCB 108 (BZ)/107 (IUPAC)	250	C	38		
PCB 109 (BZ)/108 (IUPAC)	820	C	110		
PCB 110 (BZ)	1400	C B	38		
PCB 111 (BZ)	6.6	J	19		
PCB 112 (BZ)	0.94 U		19		
PCB 113 (BZ)	4300	C B	57		
PCB 114 (BZ)	200		1.9	0.00003	0.0060

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.94	Units.....:	pg/g
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 115 (BZ)	1400	C B	38		
PCB 116 (BZ)	1100	C	57		
PCB 117 (BZ)	1100	C	57		
PCB 119 (BZ)	820	C	110		
PCB 120 (BZ)	50		19		
PCB 121 (BZ)	2.4	J Q	19		
PCB 122 (BZ)	0.94 U		19		
PCB 123 (BZ)	120		1.9	0.00003	0.0036
PCB 124 (BZ)	250	C	38		
PCB 125 (BZ)	820	C	110		
PCB 126 (BZ)	20		1.9	0.1	2.0
PCB 127 (BZ)	13	J	19		
PCB 128 (BZ)	1200	C	38		
PCB 130 (BZ)	380		19		
PCB 131 (BZ)	4.1	J	19		
PCB 132 (BZ)	140		19		
PCB 133 (BZ)	75		19		
PCB 134 (BZ)	17	C J	38		
PCB 135 (BZ)	380	C	38		
PCB 136 (BZ)	56		19		
PCB 137 (BZ)	270		19		
PCB 139 (BZ)	120	C	38		
PCB 140 (BZ)	120	C	38		
PCB 141 (BZ)	700		19		
PCB 142 (BZ)	0.94 U		19		
PCB 143 (BZ)	17	C J	38		
PCB 144 (BZ)	89		19		
PCB 145 (BZ)	0.94 U		19		
PCB 146 (BZ)	1100		19		
PCB 147 (BZ)	450	C	38		
PCB 148 (BZ)	5.2	J Q	19		
PCB 149 (BZ)	450	C	38		
PCB 150 (BZ)	0.94 U		19		
PCB 151 (BZ)	380	C	38		
PCB 152 (BZ)	0.94 U		19		
PCB 154 (BZ)	73		19		
PCB 155 (BZ)	2.1	J Q	19		

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.94	Units.....:	pg/g
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 156 (BZ)	1700	C	38	0.00003	0.051
PCB 157 (BZ)	1700	C	38	0.00003	0.051
PCB 158 (BZ)	950		19		
PCB 159 (BZ)	0.94 U		19		
PCB 160 (BZ)	0.94 U		19		
PCB 161 (BZ)	0.94 U		19		
PCB 162 (BZ)	69		19		
PCB 164 (BZ)	140		19		
PCB 165 (BZ)	1.3	J Q	19		
PCB 166 (BZ)	1200	C	38		
PCB 167 (BZ)	590		1.9	0.00003	0.018
PCB 169 (BZ)	0.94 U		1.9	0.03	0.028
PCB 170 (BZ)	1200		19		
PCB 171 (BZ)	340	C	38		
PCB 172 (BZ)	220		19		
PCB 173 (BZ)	340	C	38		
PCB 174 (BZ)	60		19		
PCB 175 (BZ)	24		19		
PCB 176 (BZ)	5.5	J	19		
PCB 177 (BZ)	310		19		
PCB 178 (BZ)	62		19		
PCB 179 (BZ)	16	J	19		
PCB 180 (BZ)	2000	C	38		
PCB 181 (BZ)	30		19		
PCB 182 (BZ)	4.9	J Q	19		
PCB 183 (BZ)	550		19		
PCB 184 (BZ)	1.6	J	19		
PCB 185 (BZ)	1.9 U		19		
PCB 186 (BZ)	0.94 U		19		
PCB 187 (BZ)	850		19		
PCB 188 (BZ)	5.1	J	19		
PCB 189 (BZ)	43	B	1.9	0.00003	0.0013
PCB 190 (BZ)	190		19		
PCB 191 (BZ)	50		19		
PCB 192 (BZ)	0.94 U		19		
PCB 193 (BZ)	2000	C	38		
PCB 194 (BZ)	200		19		

337

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN751AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.94	Units.....:	pg/g
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 195 (BZ)	73		19		
PCB 196 (BZ)	83		19		
PCB 197 (BZ)	8.1	J	19		
PCB 198 (BZ)	250	C	38		
PCB 199 (BZ)/200 (IUPAC)	2.4	J Q	19		
PCB 200 (BZ)/201 (IUPAC)	26		19		
PCB 201 (BZ)/199 (IUPAC)	250	C	38		
PCB 202 (BZ)	44		19		
PCB 203 (BZ)	180		19		
PCB 204 (BZ)	0.94 U		19		
PCB 205 (BZ)	7.5	J	19		
PCB 206 (BZ)	71		19		
PCB 207 (BZ)	11	J	19		
PCB 208 (BZ)	29		19		
PCB 209 (BZ)	23		19		
Monochlorobiphenyl (total)	4.7		19		
Dichlorobiphenyl (total)	70		19		
Trichlorobiphenyl (total)	650		19		
Tetrachlorobiphenyl (total)	7700		19		
Pentachlorobiphenyl (total)	29000		19		
Hexachlorobiphenyl (total)	24000		19		
Heptachlorobiphenyl (total)	6000		19		
Octachlorobiphenyl (total)	870		19		
Nonachlorobiphenyl (total)	110		19		
Total TEQ Concentration					**2.2**

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	**Work Order #....:**	MQN751AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.94	**Units.....:**	pg/g
Initial Wgt/Vol :	10.54 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 1	48	5.0 - 145
13C12-PCB 3	49	5.0 - 145
13C12-PCB 4	31	5.0 - 145
13C12-PCB 15	59	5.0 - 145
13C12-PCB 19	35	5.0 - 145
13C12-PCB 37	86	5.0 - 145
13C12-PCB 54	35	5.0 - 145
13C12-PCB 77	92	10 - 145
13C12-PCB 81	92	10 - 145
13C12-PCB 104	45	10 - 145
13C12-PCB 105	76	10 - 145
13C12-PCB 114	76	10 - 145
13C12-PCB 118	78	10 - 145
13C12-PCB 123	76	10 - 145
13C12-PCB 126	77	10 - 145
13C12-PCB 155	72	10 - 145
13C12-PCB 156	137	10 - 145
13C12-PCB 157	137	10 - 145
13C12-PCB 167	135	10 - 145
13C12-PCB 169	118	10 - 145
13C12-PCB 188	60	10 - 145
13C12-PCB 189	115	10 - 145
13C12-PCB 202	75	10 - 145
13C12-PCB 205	85	10 - 145
13C12-PCB 206	75	10 - 145
13C12-PCB 208	81	10 - 145
13C12-PCB 209	62	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	88	5.0 - 145
13C12-PCB 178	68	10 - 145
13C12-PCB 111	77	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	**Work Order #....:**	MQN751AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.94	**Units.....:**	pg/g
Initial Wgt/Vol :	10.54 g	**Analyst ID....:**	Sylvia H. Krenn		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	Work Order #....:	MQN752AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.74	Units.....:	pg/g
Initial Wgt/Vol :	10.54 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 52 (BZ)	2100	B	95		
PCB 99 (BZ)	4300		95		
PCB 105 (BZ)	2800	B	9.5	0.00003	0.084
PCB 118 (BZ)	9300	B	9.5	0.00003	0.28
PCB 129 (BZ)	11000	C	280		
PCB 138 (BZ)	11000	C	280		
PCB 153 (BZ)	8800	C	190		
PCB 163 (BZ)	11000	C	280		
PCB 168 (BZ)	8800	C	190		

Total TEQ Concentration 0.36

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 54	46		5.0 - 145
13C12-PCB 77	74		10 - 145
13C12-PCB 81	74		10 - 145
13C12-PCB 104	55		10 - 145
13C12-PCB 105	78		10 - 145
13C12-PCB 114	73		10 - 145
13C12-PCB 118	81		10 - 145
13C12-PCB 123	79		10 - 145
13C12-PCB 126	78		10 - 145
13C12-PCB 155	68		10 - 145
13C12-PCB 156	99	C	10 - 145
13C12-PCB 157	99	C	10 - 145
13C12-PCB 167	91		10 - 145
13C12-PCB 169	97		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	74	5.0 - 145
13C12-PCB 178	77	10 - 145
13C12-PCB 111	79	10 - 145

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 002	**Work Order #....:**	MQN752AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	4.74	**Units.....:**	pg/g
Initial Wgt/Vol :	10.54 g	**Analyst ID....:**	Sylvia H. Krenn		

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	4.4	J	19		
PCB 2 (BZ)	1.5	J Q	19		
PCB 3 (BZ)	0.86	J Q	19		
PCB 4 (BZ)	24		19		
PCB 5 (BZ)	9.6 U		19		
PCB 6 (BZ)	20		19		
PCB 7 (BZ)	9.6 U		19		
PCB 8 (BZ)	60		19		
PCB 9 (BZ)	9.6 U		19		
PCB 10 (BZ)	9.6 U		19		
PCB 11 (BZ)	32	B	19		
PCB 12 (BZ)	19 U		39		
PCB 13 (BZ)	19 U		39		
PCB 14 (BZ)	9.6 U		19		
PCB 15 (BZ)	9.6 U		19		
PCB 16 (BZ)	17	J	19		
PCB 17 (BZ)	26		19		
PCB 18 (BZ)	79	C B	39		
PCB 19 (BZ)	29		19		
PCB 20 (BZ)	460	C B	39		
PCB 21 (BZ)	60	C B	39		
PCB 22 (BZ)	80		19		
PCB 23 (BZ)	0.96 U		19		
PCB 24 (BZ)	0.83	J	19		
PCB 25 (BZ)	29		19		
PCB 26 (BZ)	65	C	39		
PCB 27 (BZ)	7.1	J	19		
PCB 28 (BZ)	460	C B	39		
PCB 29 (BZ)	65	C	39		
PCB 30 (BZ)	79	C B	37		
PCB 31 (BZ)	250	B	19		
PCB 32 (BZ)	47	B	19		
PCB 33 (BZ)	60	C B	39		
PCB 34 (BZ)	3.7	J Q	19		
PCB 35 (BZ)	1.9 U		19		
PCB 36 (BZ)	28		19		
PCB 37 (BZ)	6.9	J B	19		

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.96 U		19		
PCB 39 (BZ)	0.96 U		19		
PCB 40 (BZ)	75	C	39		
PCB 41 (BZ)	3.0	J	19		
PCB 42 (BZ)	42		19		
PCB 43 (BZ)	0.96 U		19		
PCB 44 (BZ)	850	C B	58		
PCB 45 (BZ)	34		19		
PCB 46 (BZ)	9.9	J	19		
PCB 47 (BZ)	850	C B	58		
PCB 48 (BZ)	8.4	J	19		
PCB 49 (BZ)	1000	C B	39		
PCB 50 (BZ)	96	C	39		
PCB 51 (BZ)	20		19		
PCB 53 (BZ)	96	C	39		
PCB 54 (BZ)	6.0	J	19		
PCB 55 (BZ)	1.9 U		19		
PCB 56 (BZ)	130		19		
PCB 57 (BZ)	70		19		
PCB 58 (BZ)	0.96 U		19		
PCB 59 (BZ)	85	C	58		
PCB 60 (BZ)	280		19		
PCB 61 (BZ)	3500	C B	77		
PCB 62 (BZ)	85	C	58		
PCB 63 (BZ)	92		19		
PCB 64 (BZ)	330		19		
PCB 65 (BZ)	850	C B	58		
PCB 67 (BZ)	33		19		
PCB 68 (BZ)	31	Q	19		
PCB 69 (BZ)	1000	C B	39		
PCB 70 (BZ)	3500	C B	77		
PCB 71 (BZ)	75	C	39		
PCB 72 (BZ)	45		19		
PCB 73 (BZ)	0.96 U		19		
PCB 74 (BZ)	3500	C B	77		
PCB 75 (BZ)	85	C	58		
PCB 76 (BZ)	3500	C B	77		

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 77 (BZ)	34	Q	1.9	0.0001	0.0034
PCB 78 (BZ)	0.96 U		19		
PCB 79 (BZ)	38		19		
PCB 80 (BZ)	0.96 U		19		
PCB 81 (BZ)	3.4		1.9	0.0003	0.0010
PCB 82 (BZ)	48		19		
PCB 83 (BZ)	0.96 U		19		
PCB 84 (BZ)	280		19		
PCB 85 (BZ)	1100	C	77		
PCB 86 (BZ)	1300	C	120		
PCB 87 (BZ)	1300	C	120		
PCB 88 (BZ)	290	C	39		
PCB 89 (BZ)	0.96 U		19		
PCB 91 (BZ)	290	C	39		
PCB 92 (BZ)	1100		19		
PCB 93 (BZ)	35	C J	39		
PCB 94 (BZ)	4.2	J Q	19		
PCB 95 (BZ)	1700	B	19		
PCB 96 (BZ)	7.5	J	19		
PCB 97 (BZ)	1300	C	120		
PCB 98 (BZ)	16	C J	39		
PCB 100 (BZ)	35	C J	39		
PCB 102 (BZ)	16	C J	39		
PCB 103 (BZ)	39		19		
PCB 104 (BZ)	0.96 U		19		
PCB 106 (BZ)	1.9 U		19		
PCB 107 (BZ)/109 (IUPAC)	570		19		
PCB 108 (BZ)/107 (IUPAC)	240	C	39		
PCB 109 (BZ)/108 (IUPAC)	1300	C	120		
PCB 110 (BZ)	2600	C B	39		
PCB 111 (BZ)	5.6	J Q	19		
PCB 112 (BZ)	0.96 U		19		
PCB 114 (BZ)	170		1.9	0.00003	0.0051
PCB 115 (BZ)	2600	C B	39		
PCB 116 (BZ)	1100	C	77		
PCB 117 (BZ)	1100	C	77		
PCB 119 (BZ)	1300	C	120		

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 120 (BZ)	42		19		
PCB 121 (BZ)	2.1	J Q	19		
PCB 122 (BZ)	0.96 U		19		
PCB 123 (BZ)	96		1.9	0.00003	0.0029
PCB 124 (BZ)	240	C	39		
PCB 125 (BZ)	1300	C	120		
PCB 126 (BZ)	23	G	2.0	0.1	2.3
PCB 127 (BZ)	8.8	J	19		
PCB 128 (BZ)	840	C	39		
PCB 130 (BZ)	340		19		
PCB 131 (BZ)	5.2	J	19		
PCB 132 (BZ)	210		19		
PCB 133 (BZ)	81		19		
PCB 134 (BZ)	27	C J	39		
PCB 135 (BZ)	400	C	39		
PCB 136 (BZ)	85		19		
PCB 137 (BZ)	210		19		
PCB 139 (BZ)	82	C	39		
PCB 140 (BZ)	82	C	39		
PCB 141 (BZ)	540		19		
PCB 142 (BZ)	0.96 U		19		
PCB 143 (BZ)	27	C J	39		
PCB 144 (BZ)	76		19		
PCB 145 (BZ)	0.96 U		19		
PCB 146 (BZ)	860		19		
PCB 147 (BZ)	560	C	39		
PCB 148 (BZ)	0.96 U		19		
PCB 149 (BZ)	560	C	39		
PCB 150 (BZ)	0.96 U		19		
PCB 151 (BZ)	400	C	39		
PCB 152 (BZ)	0.96 U		19		
PCB 154 (BZ)	51		19		
PCB 155 (BZ)	0.96 U		19		
PCB 156 (BZ)	1300	C	3.9	0.00003	0.039
PCB 157 (BZ)	1300	C	3.9	0.00003	0.039
PCB 158 (BZ)	670		19		
PCB 159 (BZ)	0.96 U		19		

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 160 (BZ)	0.96 U		19		
PCB 161 (BZ)	0.96 U		19		
PCB 162 (BZ)	54		19		
PCB 164 (BZ)	130		19		
PCB 165 (BZ)	0.96 U		19		
PCB 166 (BZ)	840	C	39		
PCB 167 (BZ)	420		1.9	0.00003	0.013
PCB 169 (BZ)	0.96 U		2.1	0.03	0.029
PCB 170 (BZ)	760		19		
PCB 171 (BZ)	200	C	39		
PCB 172 (BZ)	160		19		
PCB 173 (BZ)	200	C	39		
PCB 174 (BZ)	77		19		
PCB 175 (BZ)	13	J Q	19		
PCB 176 (BZ)	6.3	J	19		
PCB 177 (BZ)	300		19		
PCB 178 (BZ)	71		19		
PCB 179 (BZ)	17	J	19		
PCB 180 (BZ)	1400	C	39		
PCB 181 (BZ)	14	J Q	19		
PCB 182 (BZ)	3.1	J	19		
PCB 183 (BZ)	340		19		
PCB 184 (BZ)	0.96 U		19		
PCB 185 (BZ)	27	Q	19		
PCB 186 (BZ)	0.96 U		19		
PCB 187 (BZ)	580		19		
PCB 188 (BZ)	2.4	J Q	19		
PCB 189 (BZ)	22	Q B	1.9	0.00003	0.00066
PCB 190 (BZ)	130		19		
PCB 191 (BZ)	32		19		
PCB 192 (BZ)	0.96 U		19		
PCB 193 (BZ)	1400	C	39		
PCB 194 (BZ)	110		19		
PCB 195 (BZ)	43		19		
PCB 196 (BZ)	54		19		
PCB 197 (BZ)	5.6	J Q	19		
PCB 198 (BZ)	160	C	39		

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 199 (BZ)/200 (IUPAC)	1.9 U		19		
PCB 200 (BZ)/201 (IUPAC)	17	J	19		
PCB 201 (BZ)/199 (IUPAC)	160	C	39		
PCB 202 (BZ)	37		19		
PCB 203 (BZ)	100		19		
PCB 204 (BZ)	0.96 U		19		
PCB 205 (BZ)	2.5	J Q	19		
PCB 206 (BZ)	42		19		
PCB 207 (BZ)	6.6	J	19		
PCB 208 (BZ)	17	J	19		
PCB 209 (BZ)	13	J	19		
Monochlorobiphenyl (total)	6.8		19		
Dichlorobiphenyl (total)	140		19		
Trichlorobiphenyl (total)	1200		19		
Tetrachlorobiphenyl (total)	12000		19		
Pentachlorobiphenyl (total)	33000		19		
Hexachlorobiphenyl (total)	19000		19		
Heptachlorobiphenyl (total)	4100		19		
Octachlorobiphenyl (total)	530		19		
Nonachlorobiphenyl (total)	66		19		
Total TEQ Concentration					2.4

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN761AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/20/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 1	52	5.0 - 145
13C12-PCB 3	52	5.0 - 145
13C12-PCB 4	33	5.0 - 145
13C12-PCB 15	63	5.0 - 145
13C12-PCB 19	38	5.0 - 145
13C12-PCB 37	93	5.0 - 145
13C12-PCB 54	36	5.0 - 145
13C12-PCB 77	90	10 - 145
13C12-PCB 81	91	10 - 145
13C12-PCB 104	52	10 - 145
13C12-PCB 105	78	10 - 145
13C12-PCB 114	81	10 - 145
13C12-PCB 118	80	10 - 145
13C12-PCB 123	79	10 - 145
13C12-PCB 126	78	10 - 145
13C12-PCB 155	79	10 - 145
13C12-PCB 156	142	10 - 145
13C12-PCB 157	142	10 - 145
13C12-PCB 167	142	10 - 145
13C12-PCB 169	127	10 - 145
13C12-PCB 188	71	10 - 145
13C12-PCB 189	125	10 - 145
13C12-PCB 202	87	10 - 145
13C12-PCB 205	89	10 - 145
13C12-PCB 206	80	10 - 145
13C12-PCB 208	87	10 - 145
13C12-PCB 209	64	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	92	5.0 - 145
13C12-PCB 178	69	10 - 145
13C12-PCB 111	82	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	**Work Order #....:**	MQN761AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/20/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.96	**Units.....:**	pg/g
Initial Wgt/Vol :	10.34 g	**Analyst ID....:**	Sylvia H. Krenn		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
G	Elevated reporting limit. The reporting limit is elevated due to matrix interference.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	Work Order #....:	MQN762AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.83	Units.....:	pg/g
Initial Wgt/Vol :	10.34 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 52 (BZ)	3100	B	97		
PCB 66 (BZ)	1700		97		
PCB 90 (BZ)	5800	C	290		
PCB 99 (BZ)	3700		97		
PCB 101 (BZ)	5800	C	290		
PCB 105 (BZ)	2600	B	9.7	0.00003	0.078
PCB 113 (BZ)	5800	C	290		
PCB 118 (BZ)	8200	B	9.7	0.00003	0.25
PCB 129 (BZ)	7800	C	290		
PCB 138 (BZ)	7800	C	290		
PCB 153 (BZ)	6400	C	190		
PCB 163 (BZ)	7800	C	290		
PCB 168 (BZ)	6400	C	190		
Total TEQ Concentration					0.33

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 54	47		5.0 - 145
13C12-PCB 77	77		10 - 145
13C12-PCB 81	78		10 - 145
13C12-PCB 104	61		10 - 145
13C12-PCB 105	82		10 - 145
13C12-PCB 114	82		10 - 145
13C12-PCB 118	85		10 - 145
13C12-PCB 123	84		10 - 145
13C12-PCB 126	83		10 - 145
13C12-PCB 155	74		10 - 145
13C12-PCB 156	103	C	10 - 145
13C12-PCB 157	103	C	10 - 145
13C12-PCB 167	105		10 - 145
13C12-PCB 169	104		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	81	5.0 - 145
13C12-PCB 178	81	10 - 145
13C12-PCB 111	85	10 - 145

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 003	**Work Order #....:**	MQN762AD	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	02/01/12	**Date Received.....:**	02/08/12	**Instrument ID.....:**	12D8
Prep Date.....:	02/14/12	**Analysis Date.....:**	02/22/12		
Prep Batch # .....:	2045127	**Dilution Factor.....:**	4.83	**Units.....:**	pg/g
Initial Wgt/Vol :	10.34 g	**Analyst ID.....:**	Sylvia H. Krenn		

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	49.4	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	24	J Q	990		
PCB 2 (BZ)	25	J	990		
PCB 3 (BZ)	14	J Q	990		
PCB 4 (BZ)	190	J	990		
PCB 5 (BZ)	490 U		990		
PCB 6 (BZ)	210	J Q	990		
PCB 7 (BZ)	50	J	990		
PCB 8 (BZ)	700	J Q	990		
PCB 9 (BZ)	68	J	990		
PCB 10 (BZ)	490 U		990		
PCB 11 (BZ)	770	J Q B	990		
PCB 12 (BZ)	990 U		2000		
PCB 13 (BZ)	990 U		2000		
PCB 14 (BZ)	490 U		990		
PCB 15 (BZ)	280	J	990		
PCB 16 (BZ)	170	J	990		
PCB 17 (BZ)	530	J	990		
PCB 18 (BZ)	1100	C J B	200000		
PCB 19 (BZ)	200	J	990		
PCB 20 (BZ)	5600	C B	2000		
PCB 21 (BZ)	1600	C J B	2000		
PCB 22 (BZ)	940	J	990		
PCB 23 (BZ)	49 U		990		
PCB 24 (BZ)	12	J Q	990		
PCB 25 (BZ)	440	J	990		
PCB 26 (BZ)	900	C J	2000		
PCB 27 (BZ)	130	J	990		
PCB 28 (BZ)	5600	C B	2000		
PCB 29 (BZ)	900	C J	2000		
PCB 30 (BZ)	1100	C J B	2000		
PCB 31 (BZ)	4100	B	990		
PCB 32 (BZ)	1300	B	990		
PCB 33 (BZ)	1600	C J B	2000		
PCB 34 (BZ)	59	J	990		
PCB 35 (BZ)	99 U		990		
PCB 36 (BZ)	520	J	990		
PCB 37 (BZ)	560	J B	990		

353

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	49.4	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	49 U		990		
PCB 39 (BZ)	13	J Q	990		
PCB 40 (BZ)	3400	C	2000		
PCB 41 (BZ)	49 U		990		
PCB 42 (BZ)	1500		990		
PCB 43 (BZ)	49 U		990		
PCB 44 (BZ)	20000	C B	3000		
PCB 45 (BZ)	540	J	990		
PCB 46 (BZ)	200	J	990		
PCB 47 (BZ)	20000	C B	3000		
PCB 48 (BZ)	840	J	990		
PCB 49 (BZ)	20000	C B	2000		
PCB 50 (BZ)	2000	C	2000		
PCB 51 (BZ)	740	J	990		
PCB 52 (BZ)	58000	B	990		
PCB 53 (BZ)	2000	C	2000		
PCB 54 (BZ)	38	J	990		
PCB 55 (BZ)	99 U		990		
PCB 56 (BZ)	4800		990		
PCB 57 (BZ)	2100		990		
PCB 58 (BZ)	49 U		990		
PCB 59 (BZ)	1200	C J	3000		
PCB 60 (BZ)	2700		990		
PCB 61 (BZ)	51000	C B	4000		
PCB 62 (BZ)	1200	C J	3000		
PCB 63 (BZ)	910	J	990		
PCB 64 (BZ)	7000		990		
PCB 65 (BZ)	20000	C B	3000		
PCB 66 (BZ)	22000		990		
PCB 67 (BZ)	560	J	990		
PCB 68 (BZ)	320	J	990		
PCB 69 (BZ)	20000	C B	2000		
PCB 70 (BZ)	51000	C B	4000		
PCB 71 (BZ)	3400	C	2000		
PCB 72 (BZ)	630	J	990		
PCB 73 (BZ)	49 U		990		
PCB 74 (BZ)	51000	C B	4000		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	49.4	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	1200	C J	3000		
PCB 76 (BZ)	51000	C B	4000		
PCB 77 (BZ)	640		99	0.0001	0.064
PCB 78 (BZ)	49 U		990		
PCB 79 (BZ)	1800		990		
PCB 80 (BZ)	49 U		990		
PCB 81 (BZ)	49 U		99	0.0003	0.015
PCB 82 (BZ)	3600		990		
PCB 83 (BZ)	49 U		990		
PCB 84 (BZ)	13000		990		
PCB 85 (BZ)	15000	C	3000		
PCB 86 (BZ)	61000	C	5900		
PCB 87 (BZ)	61000	C	5900		
PCB 88 (BZ)	11000	C	2000		
PCB 89 (BZ)	310	J	990		
PCB 90 (BZ)	150000	C B	3000		
PCB 91 (BZ)	11000	C	2000		
PCB 92 (BZ)	25000		990		
PCB 93 (BZ)	600	C J	2000		
PCB 94 (BZ)	170	J	990		
PCB 95 (BZ)	65000	B	990		
PCB 96 (BZ)	130	J	990		
PCB 97 (BZ)	61000	C	5900		
PCB 98 (BZ)	1700	C J	2000		
PCB 99 (BZ)	61000		990		
PCB 100 (BZ)	600	C J	2000		
PCB 101 (BZ)	150000	C B	3000		
PCB 102 (BZ)	1700	C J	2000		
PCB 103 (BZ)	780	J	990		
PCB 104 (BZ)	49 U		990		
PCB 105 (BZ)	31000	B	99	0.00003	0.93
PCB 106 (BZ)	99 U		990		
PCB 107 (BZ)/109 (IUPAC)	6700		990		
PCB 108 (BZ)/107 (IUPAC)	4100	C	2000		
PCB 109 (BZ)/108 (IUPAC)	61000	C	5900		
PCB 110 (BZ)	120000	C B	2000		
PCB 111 (BZ)	77	J	990		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	49.4	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	49 U		990		
PCB 113 (BZ)	150000	C B	3000		
PCB 114 (BZ)	2100		99	0.00003	0.063
PCB 115 (BZ)	120000	C B	2000		
PCB 116 (BZ)	15000	C	3000		
PCB 117 (BZ)	15000	C	3000		
PCB 118 (BZ)	100000	E B	99	0.00003	3.0
PCB 119 (BZ)	61000	C	5900		
PCB 120 (BZ)	360	J	990		
PCB 121 (BZ)	49 U		990		
PCB 122 (BZ)	1100		990		
PCB 123 (BZ)	900		99	0.00003	0.027
PCB 124 (BZ)	4100	C	2000		
PCB 125 (BZ)	61000	C	5900		
PCB 126 (BZ)	120		99	0.1	12
PCB 127 (BZ)	140	J Q	990		
PCB 128 (BZ)	15000	C	2000		
PCB 129 (BZ)	100000	C	3000		
PCB 130 (BZ)	6700		990		
PCB 131 (BZ)	450	J	990		
PCB 132 (BZ)	20000		990		
PCB 133 (BZ)	1400		990		
PCB 134 (BZ)	3000	C	2000		
PCB 135 (BZ)	20000	C	2000		
PCB 136 (BZ)	7400		990		
PCB 137 (BZ)	4300		990		
PCB 138 (BZ)	100000	C	3000		
PCB 139 (BZ)	1900	C J	2000		
PCB 140 (BZ)	1900	C J	2000		
PCB 141 (BZ)	15000		990		
PCB 142 (BZ)	49 U		990		
PCB 143 (BZ)	3000	C	2000		
PCB 144 (BZ)	2900		990		
PCB 145 (BZ)	19	J Q	990		
PCB 146 (BZ)	11000		990		
PCB 147 (BZ)	55000	C	2000		
PCB 148 (BZ)	82	J	990		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	49.4	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	55000	C	2000		
PCB 150 (BZ)	93	J	990		
PCB 151 (BZ)	20000	C	2000		
PCB 152 (BZ)	47	J	990		
PCB 153 (BZ)	76000	C	2000		
PCB 154 (BZ)	960	J	990		
PCB 155 (BZ)	11	J Q	990		
PCB 156 (BZ)	14000	C	200	0.00003	0.42
PCB 157 (BZ)	14000	C	200	0.00003	0.42
PCB 158 (BZ)	11000		990		
PCB 159 (BZ)	170	J	990		
PCB 160 (BZ)	49 U		990		
PCB 161 (BZ)	49 U		990		
PCB 162 (BZ)	560	J	990		
PCB 163 (BZ)	100000	C	3000		
PCB 164 (BZ)	6000		990		
PCB 165 (BZ)	49 U		990		
PCB 166 (BZ)	15000	C	2000		
PCB 167 (BZ)	5000		99	0.00003	0.15
PCB 168 (BZ)	76000	C	2000		
PCB 169 (BZ)	49 U		99	0.03	1.5
PCB 170 (BZ)	10000		990		
PCB 171 (BZ)	3300	C	2000		
PCB 172 (BZ)	1600		990		
PCB 173 (BZ)	3300	C	2000		
PCB 174 (BZ)	7000		990		
PCB 175 (BZ)	320	J	990		
PCB 176 (BZ)	580	J	990		
PCB 177 (BZ)	5500		990		
PCB 178 (BZ)	1500		990		
PCB 179 (BZ)	2400		990		
PCB 180 (BZ)	16000	C	2000		
PCB 181 (BZ)	210	J Q	990		
PCB 182 (BZ)	60	J Q	990		
PCB 183 (BZ)	4300		990		
PCB 184 (BZ)	16	J Q	990		
PCB 185 (BZ)	99 U		990		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	49.4	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	49 U		990		
PCB 187 (BZ)	7800		990		
PCB 188 (BZ)	46	J	990		
PCB 189 (BZ)	310	B	99	0.00003	0.0093
PCB 190 (BZ)	1700		990		
PCB 191 (BZ)	440	J	990		
PCB 192 (BZ)	49 U		990		
PCB 193 (BZ)	16000	C	2000		
PCB 194 (BZ)	1600		990		
PCB 195 (BZ)	630	J	990		
PCB 196 (BZ)	780	J	990		
PCB 197 (BZ)	71	J	990		
PCB 198 (BZ)	2300	C	2000		
PCB 199 (BZ)/200 (IUPAC)	140	J	990		
PCB 200 (BZ)/201 (IUPAC)	270	J	990		
PCB 201 (BZ)/199 (IUPAC)	2300	C	2000		
PCB 202 (BZ)	590	J	990		
PCB 203 (BZ)	1500		990		
PCB 204 (BZ)	49 U		990		
PCB 205 (BZ)	87	J	990		
PCB 206 (BZ)	700	J	990		
PCB 207 (BZ)	100	J	990		
PCB 208 (BZ)	300	J	990		
PCB 209 (BZ)	250	J	990		
Monochlorobiphenyl (total)	63		990		
Dichlorobiphenyl (total)	2200		990		
Trichlorobiphenyl (total)	18000		990		
Tetrachlorobiphenyl (total)	200000		990		
Pentachlorobiphenyl (total)	670000		990		
Hexachlorobiphenyl (total)	380000		990		
Heptachlorobiphenyl (total)	64000		990		
Octachlorobiphenyl (total)	8000		990		
Nonachlorobiphenyl (total)	1100		990		
Total TEQ Concentration					19

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN781AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	49.4	**Units.....:**	pg/g
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	49		5.0 - 145
13C12-PCB 3	59		5.0 - 145
13C12-PCB 4	44		5.0 - 145
13C12-PCB 15	56		5.0 - 145
13C12-PCB 19	67		5.0 - 145
13C12-PCB 37	70		5.0 - 145
13C12-PCB 54	49		5.0 - 145
13C12-PCB 77	91		10 - 145
13C12-PCB 81	88		10 - 145
13C12-PCB 104	55		10 - 145
13C12-PCB 105	82		10 - 145
13C12-PCB 114	83		10 - 145
13C12-PCB 118	83		10 - 145
13C12-PCB 123	81		10 - 145
13C12-PCB 126	79		10 - 145
13C12-PCB 155	78		10 - 145
13C12-PCB 156	105	C	10 - 145
13C12-PCB 157	105	C	10 - 145
13C12-PCB 167	99		10 - 145
13C12-PCB 169	101		10 - 145
13C12-PCB 188	73		10 - 145
13C12-PCB 189	94		10 - 145
13C12-PCB 202	75		10 - 145
13C12-PCB 205	88		10 - 145
13C12-PCB 206	95		10 - 145
13C12-PCB 208	89		10 - 145
13C12-PCB 209	80		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	88	5.0 - 145
13C12-PCB 178	74	10 - 145
13C12-PCB 111	78	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN781AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	49.4	**Units.....:**	pg/g
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Sylvia H. Krenn		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
E	Estimated result. Result concentration exceeds the calibration range.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

360

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.0 U		2000		
PCB 2 (BZ)	2.0 U		2000		
PCB 3 (BZ)	0.98 U		2000		
PCB 4 (BZ)	9.8 U		2000		
PCB 5 (BZ)	9.8 U		2000		
PCB 6 (BZ)	9.8 U		2000		
PCB 7 (BZ)	9.8 U		2000		
PCB 8 (BZ)	280	J Q	2000		
PCB 9 (BZ)	9.8 U		2000		
PCB 10 (BZ)	9.8 U		2000		
PCB 11 (BZ)	310	J B	2000		
PCB 12 (BZ)	20 U		4000		
PCB 13 (BZ)	20 U		4000		
PCB 14 (BZ)	9.8 U		2000		
PCB 15 (BZ)	9.8 U		2000		
PCB 16 (BZ)	76	J Q	2000		
PCB 17 (BZ)	270	J	2000		
PCB 18 (BZ)	570	C J B	4000		
PCB 19 (BZ)	110	J	2000		
PCB 20 (BZ)	2600	C J B	4000		
PCB 21 (BZ)	790	C J B	4000		
PCB 22 (BZ)	430	J	2000		
PCB 23 (BZ)	0.98 U		2000		
PCB 24 (BZ)	0.98 U		2000		
PCB 25 (BZ)	210	J	2000		
PCB 26 (BZ)	440	C J	4000		
PCB 27 (BZ)	68	J	2000		
PCB 28 (BZ)	2600	C J B	4000		
PCB 29 (BZ)	440	C J	4000		
PCB 30 (BZ)	570	C J B	4000		
PCB 31 (BZ)	1900	J B	2000		
PCB 32 (BZ)	630	J B	2000		
PCB 33 (BZ)	790	C J B	4000		
PCB 34 (BZ)	0.98 U		2000		
PCB 35 (BZ)	2.0 U		2000		
PCB 36 (BZ)	240	J	2000		
PCB 37 (BZ)	270	J B	2000		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.98 U		2000		
PCB 39 (BZ)	0.98 U		2000		
PCB 40 (BZ)	1800	C J	4000		
PCB 41 (BZ)	56	J	2000		
PCB 42 (BZ)	780	J	2000		
PCB 43 (BZ)	140	J	2000		
PCB 44 (BZ)	11000	C B	5900		
PCB 45 (BZ)	220	J	2000		
PCB 46 (BZ)	120	J	2000		
PCB 47 (BZ)	11000	C B	5900		
PCB 48 (BZ)	460	J	2000		
PCB 49 (BZ)	10000	C B	4000		
PCB 50 (BZ)	1000	C J	4000		
PCB 51 (BZ)	420	J	2000		
PCB 52 (BZ)	31000	B	2000		
PCB 53 (BZ)	1000	C J	4000		
PCB 54 (BZ)	0.98 U		2000		
PCB 55 (BZ)	2.0 U		2000		
PCB 56 (BZ)	2400		2000		
PCB 57 (BZ)	1200	J	2000		
PCB 58 (BZ)	0.98 U		2000		
PCB 59 (BZ)	630	C J	5900		
PCB 60 (BZ)	1400	J	2000		
PCB 61 (BZ)	26000	C B	7900		
PCB 62 (BZ)	630	C J	5900		
PCB 63 (BZ)	460	J	2000		
PCB 64 (BZ)	3700		2000		
PCB 65 (BZ)	11000	C B	5900		
PCB 66 (BZ)	11000		2000		
PCB 67 (BZ)	310	J	2000		
PCB 68 (BZ)	180	J	2000		
PCB 69 (BZ)	10000	C B	4000		
PCB 70 (BZ)	26000	C B	7900		
PCB 71 (BZ)	1800	C J	4000		
PCB 72 (BZ)	320	J	2000		
PCB 73 (BZ)	0.98 U		2000		
PCB 74 (BZ)	26000	C B	7900		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	630	C J	5900		
PCB 76 (BZ)	26000	C B	7900		
PCB 77 (BZ)	380		200	0.0001	0.038
PCB 78 (BZ)	0.98 U		2000		
PCB 79 (BZ)	460	J	2000		
PCB 80 (BZ)	0.98 U		2000		
PCB 81 (BZ)	0.98 U		200	0.0003	0.00029
PCB 82 (BZ)	2100		2000		
PCB 83 (BZ)	0.98 U		2000		
PCB 84 (BZ)	6900		2000		
PCB 85 (BZ)	7700	C	5900		
PCB 86 (BZ)	33000	C	12000		
PCB 87 (BZ)	33000	C	12000		
PCB 88 (BZ)	6000	C	4000		
PCB 89 (BZ)	170	J	2000		
PCB 90 (BZ)	80000	C B	5900		
PCB 91 (BZ)	6000	C	4000		
PCB 92 (BZ)	14000		2000		
PCB 93 (BZ)	370	C J	4000		
PCB 94 (BZ)	88	J	2000		
PCB 95 (BZ)	35000	B	2000		
PCB 96 (BZ)	85	J	2000		
PCB 97 (BZ)	33000	C	12000		
PCB 98 (BZ)	930	C J	4000		
PCB 99 (BZ)	33000		2000		
PCB 100 (BZ)	370	C J	4000		
PCB 101 (BZ)	80000	C B	5900		
PCB 102 (BZ)	930	C J	4000		
PCB 103 (BZ)	430	J	2000		
PCB 104 (BZ)	0.98 U		2000		
PCB 105 (BZ)	16000	B	200	0.00003	0.48
PCB 106 (BZ)	2.0 U		2000		
PCB 107 (BZ)/109 (IUPAC)	3300		2000		
PCB 108 (BZ)/107 (IUPAC)	2100	C J	4000		
PCB 109 (BZ)/108 (IUPAC)	33000	C	12000		
PCB 110 (BZ)	70000	C B	4000		
PCB 111 (BZ)	0.98 U		2000		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix.....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.98 U		2000		
PCB 113 (BZ)	80000	C B	5900		
PCB 114 (BZ)	1300		200	0.00003	0.039
PCB 115 (BZ)	70000	C B	4000		
PCB 116 (BZ)	7700	C	5900		
PCB 117 (BZ)	7700	C	5900		
PCB 118 (BZ)	54000	B	200	0.00003	1.6
PCB 119 (BZ)	33000	C	12000		
PCB 120 (BZ)	160	J Q	2000		
PCB 121 (BZ)	0.98 U		2000		
PCB 122 (BZ)	0.98 U		2000		
PCB 123 (BZ)	530		200	0.00003	0.016
PCB 124 (BZ)	2100	C J	4000		
PCB 125 (BZ)	33000	C	12000		
PCB 126 (BZ)	150	J	200	0.1	15
PCB 127 (BZ)	0.98 U		2000		
PCB 128 (BZ)	8600	C	4000		
PCB 129 (BZ)	59000	C	5900		
PCB 130 (BZ)	3800		2000		
PCB 131 (BZ)	270	J	2000		
PCB 132 (BZ)	12000		2000		
PCB 133 (BZ)	870	J	2000		
PCB 134 (BZ)	1800	C J	4000		
PCB 135 (BZ)	12000	C	4000		
PCB 136 (BZ)	4800		2000		
PCB 137 (BZ)	2400		2000		
PCB 138 (BZ)	59000	C	5900		
PCB 139 (BZ)	1100	C J	4000		
PCB 140 (BZ)	1100	C J	4000		
PCB 141 (BZ)	8800		2000		
PCB 142 (BZ)	0.98 U		2000		
PCB 143 (BZ)	1800	C J	4000		
PCB 144 (BZ)	1800	J	2000		
PCB 145 (BZ)	0.98 U		2000		
PCB 146 (BZ)	6800		2000		
PCB 147 (BZ)	35000	C	4000		
PCB 148 (BZ)	0.98 U		2000		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	35000	C	4000		
PCB 150 (BZ)	18	J Q	2000		
PCB 151 (BZ)	12000	C	4000		
PCB 152 (BZ)	24	J Q	2000		
PCB 153 (BZ)	46000	C	4000		
PCB 154 (BZ)	600	J	2000		
PCB 155 (BZ)	0.98 U		2000		
PCB 156 (BZ)	8000	C	400	0.00003	0.24
PCB 157 (BZ)	8000	C	400	0.00003	0.24
PCB 158 (BZ)	6600		2000		
PCB 159 (BZ)	68	J	2000		
PCB 160 (BZ)	0.98 U		2000		
PCB 161 (BZ)	0.98 U		2000		
PCB 162 (BZ)	350	J	2000		
PCB 163 (BZ)	59000	C	5900		
PCB 164 (BZ)	3400		2000		
PCB 165 (BZ)	0.98 U		2000		
PCB 166 (BZ)	8600	C	4000		
PCB 167 (BZ)	2700		200	0.00003	0.081
PCB 168 (BZ)	46000	C	4000		
PCB 169 (BZ)	0.98 U		200	0.03	0.029
PCB 170 (BZ)	4900		2000		
PCB 171 (BZ)	1700	C J	4000		
PCB 172 (BZ)	820	J	2000		
PCB 173 (BZ)	1700	C J	4000		
PCB 174 (BZ)	3800		2000		
PCB 175 (BZ)	180	J	2000		
PCB 176 (BZ)	340	J	2000		
PCB 177 (BZ)	2900		2000		
PCB 178 (BZ)	850	J	2000		
PCB 179 (BZ)	1400	J	2000		
PCB 180 (BZ)	8500	C	4000		
PCB 181 (BZ)	69	J Q	2000		
PCB 182 (BZ)	37	J Q	2000		
PCB 183 (BZ)	2400		2000		
PCB 184 (BZ)	0.98 U		2000		
PCB 185 (BZ)	2.0 U		2000		

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN782AF	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	03/06/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.98 U		2000		
PCB 187 (BZ)	4500		2000		
PCB 188 (BZ)	14	J Q	2000		
PCB 189 (BZ)	150	J B	200	0.00003	0.0045
PCB 190 (BZ)	840	J	2000		
PCB 191 (BZ)	280	J	2000		
PCB 192 (BZ)	0.98 U		2000		
PCB 193 (BZ)	8500	C	4000		
PCB 194 (BZ)	840	J	2000		
PCB 195 (BZ)	310	J	2000		
PCB 196 (BZ)	470	J	2000		
PCB 197 (BZ)	48	J Q	2000		
PCB 198 (BZ)	1200	C J	4000		
PCB 199 (BZ)/200 (IUPAC)	68	J	2000		
PCB 200 (BZ)/201 (IUPAC)	150	J	2000		
PCB 201 (BZ)/199 (IUPAC)	1200	C J	4000		
PCB 202 (BZ)	320	J	2000		
PCB 203 (BZ)	730	J	2000		
PCB 204 (BZ)	0.98 U		2000		
PCB 205 (BZ)	36	J Q	2000		
PCB 206 (BZ)	450	J	2000		
PCB 207 (BZ)	69	J	2000		
PCB 208 (BZ)	160	J Q	2000		
PCB 209 (BZ)	130	J	2000		
Monochlorobiphenyl (total)	ND		2000		0
Dichlorobiphenyl (total)	590		2000		
Trichlorobiphenyl (total)	8700		2000		
Tetrachlorobiphenyl (total)	110000		2000		
Pentachlorobiphenyl (total)	370000		2000		
Hexachlorobiphenyl (total)	230000		2000		
Heptachlorobiphenyl (total)	34000		2000		
Octachlorobiphenyl (total)	4200		2000		
Nonachlorobiphenyl (total)	680		2000		
Total TEQ Concentration					18

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012 366

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN782AF	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	03/06/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	98		5.0 - 145
13C12-PCB 3	101		5.0 - 145
13C12-PCB 4	84		5.0 - 145
13C12-PCB 15	103		5.0 - 145
13C12-PCB 19	95		5.0 - 145
13C12-PCB 37	113		5.0 - 145
13C12-PCB 54	88		5.0 - 145
13C12-PCB 77	106		10 - 145
13C12-PCB 81	109		10 - 145
13C12-PCB 104	101		10 - 145
13C12-PCB 105	100		10 - 145
13C12-PCB 114	100		10 - 145
13C12-PCB 118	107		10 - 145
13C12-PCB 123	104		10 - 145
13C12-PCB 126	91		10 - 145
13C12-PCB 155	120		10 - 145
13C12-PCB 156	124	C	10 - 145
13C12-PCB 157	124	C	10 - 145
13C12-PCB 167	127		10 - 145
13C12-PCB 169	109		10 - 145
13C12-PCB 188	109		10 - 145
13C12-PCB 189	120		10 - 145
13C12-PCB 202	113		10 - 145
13C12-PCB 205	112		10 - 145
13C12-PCB 206	113		10 - 145
13C12-PCB 208	123		10 - 145
13C12-PCB 209	117		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	93	5.0 - 145
13C12-PCB 178	63	10 - 145
13C12-PCB 111	63	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 004	**Work Order #....:**	MQN782AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	03/06/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland. June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN791AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.1	J	20		
PCB 2 (BZ)	1.2	J Q	20		
PCB 3 (BZ)	1.6	J Q	20		
PCB 4 (BZ)	4.9	J	20		
PCB 5 (BZ)	9.8 U		20		
PCB 6 (BZ)	7.4	J	20		
PCB 7 (BZ)	9.8 U		20		
PCB 8 (BZ)	32		20		
PCB 9 (BZ)	9.8 U		20		
PCB 10 (BZ)	9.8 U		20		
PCB 11 (BZ)	26	B	20		
PCB 12 (BZ)	20 U		40		
PCB 13 (BZ)	20 U		40		
PCB 14 (BZ)	9.8 U		20		
PCB 15 (BZ)	4.0	J Q	20		
PCB 16 (BZ)	8.9	J	20		
PCB 17 (BZ)	25		20		
PCB 18 (BZ)	46	C B	40		
PCB 19 (BZ)	8.0	J	20		
PCB 20 (BZ)	180	C B	40		
PCB 21 (BZ)	88	C B	40		
PCB 22 (BZ)	37		20		
PCB 23 (BZ)	0.98 U		20		
PCB 24 (BZ)	0.98 U		20		
PCB 25 (BZ)	14	J	20		
PCB 26 (BZ)	30	C J	40		
PCB 27 (BZ)	5.2	J	20		
PCB 28 (BZ)	180	C B	40		
PCB 29 (BZ)	30	C J	40		
PCB 30 (BZ)	46	C B	40		
PCB 31 (BZ)	130	B	20		
PCB 32 (BZ)	50	B	20		
PCB 33 (BZ)	88	C B	40		
PCB 34 (BZ)	3.2	J	20		
PCB 35 (BZ)	2.0 U		20		
PCB 36 (BZ)	13	J	20		
PCB 37 (BZ)	14	J Q B	20		

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN791AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.98 U		20		
PCB 39 (BZ)	1.1	J	20		
PCB 40 (BZ)	160	C	40		
PCB 41 (BZ)	5.4	J	20		
PCB 42 (BZ)	60		20		
PCB 43 (BZ)	11	J	20		
PCB 44 (BZ)	560	C B	59		
PCB 45 (BZ)	18	J	20		
PCB 46 (BZ)	7.7	J	20		
PCB 47 (BZ)	560	C B	59		
PCB 48 (BZ)	41		20		
PCB 49 (BZ)	510	C B	40		
PCB 50 (BZ)	68	C	40		
PCB 51 (BZ)	31		20		
PCB 52 (BZ)	1500	B	20		
PCB 53 (BZ)	68	C	40		
PCB 54 (BZ)	1.4	J	20		
PCB 55 (BZ)	10	J	20		
PCB 56 (BZ)	160		20		
PCB 57 (BZ)	2.9	J	20		
PCB 58 (BZ)	2.5	J Q	20		
PCB 59 (BZ)	38	C	59		
PCB 60 (BZ)	82		20		
PCB 61 (BZ)	1300	C B	79		
PCB 62 (BZ)	38	C	59		
PCB 63 (BZ)	25		20		
PCB 64 (BZ)	200		20		
PCB 65 (BZ)	560	C B	59		
PCB 66 (BZ)	580		20		
PCB 67 (BZ)	17	J	20		
PCB 68 (BZ)	10	J	20		
PCB 69 (BZ)	510	C B	40		
PCB 70 (BZ)	1300	C B	79		
PCB 71 (BZ)	160	C	40		
PCB 72 (BZ)	16	J	20		
PCB 73 (BZ)	0.98 U		20		
PCB 74 (BZ)	1300	C B	79		

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN791AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	38	C	59		
PCB 76 (BZ)	1300	C B	79		
PCB 77 (BZ)	24		2.0	0.0001	0.0024
PCB 78 (BZ)	0.98 U		20		
PCB 79 (BZ)	15	J Q	20		
PCB 80 (BZ)	0.98 U		20		
PCB 81 (BZ)	2.0		2.0	0.0003	0.00060
PCB 82 (BZ)	120		20		
PCB 83 (BZ)	140		20		
PCB 84 (BZ)	380		20		
PCB 85 (BZ)	460	C	59		
PCB 86 (BZ)	1600	C	120		
PCB 87 (BZ)	1600	C	120		
PCB 88 (BZ)	300	C	40		
PCB 89 (BZ)	14	J	20		
PCB 90 (BZ)	3600	C B	59		
PCB 91 (BZ)	300	C	40		
PCB 92 (BZ)	660		20		
PCB 93 (BZ)	17	C J	40		
PCB 94 (BZ)	6.6	J	20		
PCB 95 (BZ)	1600	B	20		
PCB 96 (BZ)	4.1	J	20		
PCB 97 (BZ)	1600	C	120		
PCB 98 (BZ)	60	C	40		
PCB 99 (BZ)	1500		20		
PCB 100 (BZ)	17	C J	40		
PCB 101 (BZ)	3600	C B	59		
PCB 102 (BZ)	60	C	40		
PCB 103 (BZ)	22		20		
PCB 104 (BZ)	0.98 U		20		
PCB 105 (BZ)	740	B	2.0	0.00003	0.022
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	180		20		
PCB 108 (BZ)/107 (IUPAC)	110	C	40		
PCB 109 (BZ)/108 (IUPAC)	1600	C	120		
PCB 110 (BZ)	3200	C B	40		
PCB 111 (BZ)	2.3	J Q	20		

371

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN791AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.98 U		20		
PCB 113 (BZ)	3600	C B	59		
PCB 114 (BZ)	52		2.0	0.00003	0.0016
PCB 115 (BZ)	3200	C B	40		
PCB 116 (BZ)	460	C	59		
PCB 117 (BZ)	460	C	59		
PCB 119 (BZ)	1600	C	120		
PCB 120 (BZ)	11	J	20		
PCB 121 (BZ)	0.98 U		20		
PCB 122 (BZ)	27		20		
PCB 123 (BZ)	22		2.0	0.00003	0.00066
PCB 124 (BZ)	110	C	40		
PCB 125 (BZ)	1600	C	120		
PCB 126 (BZ)	5.5		2.0	0.1	0.55
PCB 127 (BZ)	4.1	J	20		
PCB 128 (BZ)	430	C	40		
PCB 129 (BZ)	2800	C	59		
PCB 130 (BZ)	200		20		
PCB 131 (BZ)	11	J Q	20		
PCB 132 (BZ)	650		20		
PCB 133 (BZ)	46		20		
PCB 134 (BZ)	88	C	40		
PCB 135 (BZ)	610	C	40		
PCB 136 (BZ)	210		20		
PCB 137 (BZ)	110		20		
PCB 138 (BZ)	2800	C	59		
PCB 139 (BZ)	54	C	40		
PCB 140 (BZ)	54	C	40		
PCB 141 (BZ)	430		20		
PCB 142 (BZ)	0.98 U		20		
PCB 143 (BZ)	88	C	40		
PCB 144 (BZ)	84		20		
PCB 145 (BZ)	0.98 U		20		
PCB 146 (BZ)	340		20		
PCB 147 (BZ)	1700	C	40		
PCB 148 (BZ)	2.8	J	20		
PCB 149 (BZ)	1700	C	40		

372

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN791AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 150 (BZ)	2.9	J	20		
PCB 151 (BZ)	610	C	40		
PCB 152 (BZ)	0.82	J Q	20		
PCB 153 (BZ)	2200	C	40		
PCB 154 (BZ)	31		20		
PCB 155 (BZ)	0.98 U		20		
PCB 156 (BZ)	380	C	4.0	0.00003	0.011
PCB 157 (BZ)	380	C	4.0	0.00003	0.011
PCB 158 (BZ)	300		20		
PCB 159 (BZ)	5.4	J	20		
PCB 160 (BZ)	0.98 U		20		
PCB 161 (BZ)	0.98 U		20		
PCB 162 (BZ)	14	J	20		
PCB 163 (BZ)	2800	C	59		
PCB 164 (BZ)	190		20		
PCB 165 (BZ)	0.98 U		20		
PCB 166 (BZ)	430	C	40		
PCB 167 (BZ)	130		2.0	0.00003	0.0039
PCB 168 (BZ)	2200	C	40		
PCB 169 (BZ)	0.98 U		2.0	0.03	0.029
PCB 170 (BZ)	340		20		
PCB 171 (BZ)	110	C	40		
PCB 172 (BZ)	64		20		
PCB 173 (BZ)	110	C	40		
PCB 174 (BZ)	290		20		
PCB 175 (BZ)	12	J	20		
PCB 176 (BZ)	21		20		
PCB 177 (BZ)	220		20		
PCB 178 (BZ)	63		20		
PCB 179 (BZ)	92		20		
PCB 180 (BZ)	580	C	40		
PCB 181 (BZ)	8.3	J	20		
PCB 182 (BZ)	3.0	J	20		
PCB 183 (BZ)	160		20		
PCB 184 (BZ)	0.98 U		20		
PCB 185 (BZ)	23		20		
PCB 186 (BZ)	0.98 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN791AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 187 (BZ)	330		20		
PCB 188 (BZ)	1.1	J Q	20		
PCB 189 (BZ)	9.8	B	2.0	0.00003	0.00029
PCB 190 (BZ)	50		20		
PCB 191 (BZ)	15	J	20		
PCB 192 (BZ)	0.98 U		20		
PCB 193 (BZ)	580	C	40		
PCB 194 (BZ)	66		20		
PCB 195 (BZ)	31		20		
PCB 196 (BZ)	41		20		
PCB 197 (BZ)	3.4	J	20		
PCB 198 (BZ)	130	C	40		
PCB 199 (BZ)/200 (IUPAC)	8.3	J	20		
PCB 200 (BZ)/201 (IUPAC)	15	J	20		
PCB 201 (BZ)/199 (IUPAC)	130	C	40		
PCB 202 (BZ)	29		20		
PCB 203 (BZ)	78		20		
PCB 204 (BZ)	0.98 U		20		
PCB 205 (BZ)	3.7	J	20		
PCB 206 (BZ)	40		20		
PCB 207 (BZ)	5.4	J Q	20		
PCB 208 (BZ)	17	J	20		
PCB 209 (BZ)	15	J	20		
Monochlorobiphenyl (total)	4.8		20		
Dichlorobiphenyl (total)	75		20		
Trichlorobiphenyl (total)	650		20		
Tetrachlorobiphenyl (total)	5400		20		
Pentachlorobiphenyl (total)	17000		20		
Hexachlorobiphenyl (total)	11000		20		
Heptachlorobiphenyl (total)	2400		20		
Octachlorobiphenyl (total)	400		20		
Nonachlorobiphenyl (total)	63		20		
Total TEQ Concentration					0.63

374

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	**Work Order #....:**	MQN791AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	50		5.0 - 145
13C12-PCB 3	54		5.0 - 145
13C12-PCB 4	46		5.0 - 145
13C12-PCB 15	66		5.0 - 145
13C12-PCB 19	53		5.0 - 145
13C12-PCB 37	79		5.0 - 145
13C12-PCB 54	48		5.0 - 145
13C12-PCB 77	86		10 - 145
13C12-PCB 81	86		10 - 145
13C12-PCB 104	59		10 - 145
13C12-PCB 105	83		10 - 145
13C12-PCB 114	83		10 - 145
13C12-PCB 118	83		10 - 145
13C12-PCB 123	82		10 - 145
13C12-PCB 126	87		10 - 145
13C12-PCB 155	73		10 - 145
13C12-PCB 156	106	C	10 - 145
13C12-PCB 157	106	C	10 - 145
13C12-PCB 167	104		10 - 145
13C12-PCB 169	99		10 - 145
13C12-PCB 188	88		10 - 145
13C12-PCB 189	107		10 - 145
13C12-PCB 202	94		10 - 145
13C12-PCB 205	86		10 - 145
13C12-PCB 206	84		10 - 145
13C12-PCB 208	96		10 - 145
13C12-PCB 209	82		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	78	5.0 - 145
13C12-PCB 178	78	10 - 145
13C12-PCB 111	83	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	**Work Order #....:**	MQN791AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 005	Work Order #....:	MQN792AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.94	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 118 (BZ)	2400	B	9.9	0.00003	0.072

Total TEQ Concentration 0.072

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 118	82	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 111	80	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

377

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix.....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	1.9 U		20		
PCB 2 (BZ)	1.9 U		20		
PCB 3 (BZ)	1.1	J	20		
PCB 4 (BZ)	9.7 U		20		
PCB 5 (BZ)	9.7 U		20		
PCB 6 (BZ)	9.7 U		20		
PCB 7 (BZ)	9.7 U		20		
PCB 8 (BZ)	9.7 U		20		
PCB 9 (BZ)	9.7 U		20		
PCB 10 (BZ)	9.7 U		20		
PCB 11 (BZ)	8.2	J B	20		
PCB 12 (BZ)	19 U		39		
PCB 13 (BZ)	19 U		39		
PCB 14 (BZ)	9.7 U		20		
PCB 15 (BZ)	9.7 U		20		
PCB 16 (BZ)	0.81	J Q	20		
PCB 17 (BZ)	1.1	J	20		
PCB 18 (BZ)	2.0	C J B	39		
PCB 19 (BZ)	0.97 U		20		
PCB 20 (BZ)	6.6	C J B	39		
PCB 21 (BZ)	2.1	C J B	39		
PCB 22 (BZ)	1.2	J	20		
PCB 23 (BZ)	0.97 U		20		
PCB 24 (BZ)	0.97 U		20		
PCB 25 (BZ)	0.97 U		20		
PCB 26 (BZ)	0.82	C J Q	39		
PCB 27 (BZ)	0.97 U		20		
PCB 28 (BZ)	6.6	C J B	39		
PCB 29 (BZ)	0.82	C J Q	39		
PCB 30 (BZ)	2.0	C J B	39		
PCB 31 (BZ)	5.0	J B	20		
PCB 32 (BZ)	1.3	J B	20		
PCB 33 (BZ)	2.1	C J B	39		
PCB 34 (BZ)	0.97 U		20		
PCB 35 (BZ)	1.9 U		20		
PCB 36 (BZ)	0.97 U		20		
PCB 37 (BZ)	1.0	J B	20		

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.97 U		20		
PCB 39 (BZ)	0.97 U		20		
PCB 40 (BZ)	2.2	C J	39		
PCB 41 (BZ)	0.97 U		20		
PCB 42 (BZ)	0.80	J Q	20		
PCB 43 (BZ)	0.97 U		20		
PCB 44 (BZ)	19	C J B	59		
PCB 45 (BZ)	0.97 U		20		
PCB 46 (BZ)	0.97 U		20		
PCB 47 (BZ)	19	C J B	59		
PCB 48 (BZ)	0.97 U		20		
PCB 49 (BZ)	12	C J B	39		
PCB 50 (BZ)	1.6	C J	39		
PCB 51 (BZ)	1.5	J Q	20		
PCB 52 (BZ)	34	B	20		
PCB 53 (BZ)	1.6	C J	39		
PCB 54 (BZ)	0.97 U		20		
PCB 55 (BZ)	1.9 U		20		
PCB 56 (BZ)	2.2	J	20		
PCB 57 (BZ)	0.97 U		20		
PCB 58 (BZ)	0.97 U		20		
PCB 59 (BZ)	0.87	C J	59		
PCB 60 (BZ)	2.1	J	20		
PCB 61 (BZ)	24	C J B	78		
PCB 62 (BZ)	0.87	C J	59		
PCB 63 (BZ)	0.97 U		20		
PCB 64 (BZ)	4.5	J	20		
PCB 65 (BZ)	19	C J B	59		
PCB 66 (BZ)	12	J	20		
PCB 67 (BZ)	0.97 U		20		
PCB 68 (BZ)	1.9 U	J Q	20		
PCB 69 (BZ)	12	C J B	39		
PCB 70 (BZ)	24	C J B	78		
PCB 71 (BZ)	2.2	C J	39		
PCB 72 (BZ)	0.97 U		20		
PCB 73 (BZ)	0.97 U		20		
PCB 74 (BZ)	24	C J B	78		

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	0.87	C J	59		
PCB 76 (BZ)	24	C J B	78		
PCB 77 (BZ)	0.97 U		2.0	0.0001	0.000097
PCB 78 (BZ)	0.97 U		20		
PCB 79 (BZ)	0.97 U		20		
PCB 80 (BZ)	0.97 U		20		
PCB 81 (BZ)	0.97 U		2.0	0.0003	0.00029
PCB 82 (BZ)	0.97 U		20		
PCB 83 (BZ)	0.97 U		20		
PCB 84 (BZ)	4.6	J	20		
PCB 85 (BZ)	6.6	C J	59		
PCB 86 (BZ)	18	C J	120		
PCB 87 (BZ)	18	C J	120		
PCB 88 (BZ)	5.2	C J	39		
PCB 89 (BZ)	0.97 U		20		
PCB 90 (BZ)	47	C J B	59		
PCB 91 (BZ)	5.2	C J	39		
PCB 92 (BZ)	9.2	J	20		
PCB 93 (BZ)	1.9 U		39		
PCB 94 (BZ)	0.97 U		20		
PCB 95 (BZ)	26	B	20		
PCB 96 (BZ)	0.97 U		20		
PCB 97 (BZ)	18	C J	120		
PCB 98 (BZ)	1.9 U		39		
PCB 99 (BZ)	24		20		
PCB 100 (BZ)	1.9 U		39		
PCB 101 (BZ)	47	C J B	59		
PCB 102 (BZ)	1.9 U		39		
PCB 103 (BZ)	0.97 U		20		
PCB 104 (BZ)	0.97 U		20		
PCB 105 (BZ)	13	B	2.0	0.00003	0.00039
PCB 106 (BZ)	1.9 U		20		
PCB 107 (BZ)/109 (IUPAC)	2.9	J Q	20		
PCB 108 (BZ)/107 (IUPAC)	5.8 U		39		
PCB 109 (BZ)/108 (IUPAC)	18	C J	120		
PCB 110 (BZ)	33	C J B	39		
PCB 111 (BZ)	0.97 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.97 U		20		
PCB 113 (BZ)	47	C J B	59		
PCB 114 (BZ)	0.97 U		2.0	0.00003	0.000029
PCB 115 (BZ)	33	C J B	39		
PCB 116 (BZ)	6.6	C J	59		
PCB 117 (BZ)	6.6	C J	59		
PCB 118 (BZ)	34	B	2.0	0.00003	0.0010
PCB 119 (BZ)	18	C J	120		
PCB 120 (BZ)	0.97 U		20		
PCB 121 (BZ)	0.97 U		20		
PCB 122 (BZ)	0.97 U		20		
PCB 123 (BZ)	0.97 U		2.0	0.00003	0.000029
PCB 124 (BZ)	1.9 U		39		
PCB 125 (BZ)	18	C J	120		
PCB 126 (BZ)	0.97 U		2.0	0.1	0.097
PCB 127 (BZ)	0.97 U		20		
PCB 128 (BZ)	5.1	C J Q	39		
PCB 129 (BZ)	40	C J	59		
PCB 130 (BZ)	1.5	J Q	20		
PCB 131 (BZ)	0.97 U		20		
PCB 132 (BZ)	4.2	J Q	20		
PCB 133 (BZ)	0.97 U		20		
PCB 134 (BZ)	1.9 U		39		
PCB 135 (BZ)	6.0	C J	39		
PCB 136 (BZ)	2.5	J Q	20		
PCB 137 (BZ)	0.97 U		20		
PCB 138 (BZ)	40	C J	59		
PCB 139 (BZ)	1.9 U		39		
PCB 140 (BZ)	1.9 U		39		
PCB 141 (BZ)	4.4	J	20		
PCB 142 (BZ)	0.97 U		20		
PCB 143 (BZ)	1.9 U		39		
PCB 144 (BZ)	0.97 U		20		
PCB 145 (BZ)	0.97 U		20		
PCB 146 (BZ)	7.5	J	20		
PCB 147 (BZ)	14	C J	39		
PCB 148 (BZ)	0.97 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	14	C J	39		
PCB 150 (BZ)	0.97 U		20		
PCB 151 (BZ)	6.0	C J	39		
PCB 152 (BZ)	0.97 U		20		
PCB 153 (BZ)	45	C	39		
PCB 154 (BZ)	0.97 U		20		
PCB 155 (BZ)	0.97 U		20		
PCB 156 (BZ)	4.7	C	3.9	0.00003	0.00014
PCB 157 (BZ)	4.7	C	3.9	0.00003	0.00014
PCB 158 (BZ)	3.2	J Q	20		
PCB 159 (BZ)	0.97 U		20		
PCB 160 (BZ)	0.97 U		20		
PCB 161 (BZ)	0.97 U		20		
PCB 162 (BZ)	0.97 U	J	20		
PCB 163 (BZ)	40	C J	59		
PCB 164 (BZ)	0.97 U		20		
PCB 165 (BZ)	0.97 U		20		
PCB 166 (BZ)	5.1	C J Q	39		
PCB 167 (BZ)	2.3	Q	2.0	0.00003	0.000069
PCB 168 (BZ)	45	C	39		
PCB 169 (BZ)	0.97 U		2.0	0.03	0.029
PCB 170 (BZ)	9.2	J Q	20		
PCB 171 (BZ)	1.9 U		39		
PCB 172 (BZ)	2.8	J Q	20		
PCB 173 (BZ)	1.9 U		39		
PCB 174 (BZ)	2.4	J Q	20		
PCB 175 (BZ)	0.97 U		20		
PCB 176 (BZ)	0.97 U		20		
PCB 177 (BZ)	2.9	J	20		
PCB 178 (BZ)	1.6	J	20		
PCB 179 (BZ)	0.61	J Q	20		
PCB 180 (BZ)	22	C J	39		
PCB 181 (BZ)	1.9 U		20		
PCB 182 (BZ)	0.97 U		20		
PCB 183 (BZ)	5.8	J	20		
PCB 184 (BZ)	0.97 U		20		
PCB 185 (BZ)	1.9 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	Work Order #....:	MQN8A1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.97 U		20		
PCB 187 (BZ)	15	J	20		
PCB 188 (BZ)	0.97 U		20		
PCB 189 (BZ)	0.97 U		2.0	0.00003	0.000029
PCB 190 (BZ)	0.97 U		20		
PCB 191 (BZ)	0.97 U		20		
PCB 192 (BZ)	0.97 U		20		
PCB 193 (BZ)	22	C J	39		
PCB 194 (BZ)	3.2	J	20		
PCB 195 (BZ)	0.97 U		20		
PCB 196 (BZ)	3.9	J	20		
PCB 197 (BZ)	0.81	J	20		
PCB 198 (BZ)	12	C J	39		
PCB 199 (BZ)/200 (IUPAC)	1.9 U		20		
PCB 200 (BZ)/201 (IUPAC)	2.0	J Q	20		
PCB 201 (BZ)/199 (IUPAC)	12	C J	39		
PCB 202 (BZ)	2.0	J Q	20		
PCB 203 (BZ)	2.8	J Q	20		
PCB 204 (BZ)	0.97 U		20		
PCB 205 (BZ)	0.97 U		20		
PCB 206 (BZ)	4.6	J Q	20		
PCB 207 (BZ)	1.8	J	20		
PCB 208 (BZ)	3.8	J	20		
PCB 209 (BZ)	4.4	J	20		
Monochlorobiphenyl (total)	1.1		20		
Dichlorobiphenyl (total)	8.2		20		
Trichlorobiphenyl (total)	22		20		
Tetrachlorobiphenyl (total)	120		20		
Pentachlorobiphenyl (total)	220		20		
Hexachlorobiphenyl (total)	140		20		
Heptachlorobiphenyl (total)	62		20		
Octachlorobiphenyl (total)	27		20		
Nonachlorobiphenyl (total)	10		20		
Total TEQ Concentration					0.13

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	**Work Order #....:**	MQN8A1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.97	**Units.....:**	pg/g
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	40		5.0 - 145
13C12-PCB 3	47		5.0 - 145
13C12-PCB 4	39		5.0 - 145
13C12-PCB 15	55		5.0 - 145
13C12-PCB 19	45		5.0 - 145
13C12-PCB 37	68		5.0 - 145
13C12-PCB 54	40		5.0 - 145
13C12-PCB 77	72		10 - 145
13C12-PCB 81	77		10 - 145
13C12-PCB 104	52		10 - 145
13C12-PCB 105	65		10 - 145
13C12-PCB 114	73		10 - 145
13C12-PCB 118	75		10 - 145
13C12-PCB 123	73		10 - 145
13C12-PCB 126	73		10 - 145
13C12-PCB 155	68		10 - 145
13C12-PCB 156	92	C	10 - 145
13C12-PCB 157	92	C	10 - 145
13C12-PCB 167	91		10 - 145
13C12-PCB 169	79		10 - 145
13C12-PCB 188	102		10 - 145
13C12-PCB 189	108		10 - 145
13C12-PCB 202	105		10 - 145
13C12-PCB 205	80		10 - 145
13C12-PCB 206	86		10 - 145
13C12-PCB 208	101		10 - 145
13C12-PCB 209	78		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	65	5.0 - 145
13C12-PCB 178	71	10 - 145
13C12-PCB 111	72	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 006	**Work Order #....:**	MQN8A1AD	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received.....:**	02/08/12	**Instrument ID.....:**	12D8
Prep Date....:	02/14/12	**Analysis Date.....:**	02/23/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.97	**Units.....:**	pg/g
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.0 U		20		
PCB 2 (BZ)	2.0 U		20		
PCB 3 (BZ)	0.98 U		20		
PCB 4 (BZ)	9.8 U		20		
PCB 5 (BZ)	9.8 U		20		
PCB 6 (BZ)	9.8 U		20		
PCB 7 (BZ)	9.8 U		20		
PCB 8 (BZ)	9.8 U		20		
PCB 9 (BZ)	9.8 U		20		
PCB 10 (BZ)	9.8 U		20		
PCB 11 (BZ)	9.8 U		20		
PCB 12 (BZ)	20 U		40		
PCB 13 (BZ)	20 U		40		
PCB 14 (BZ)	9.8 U		20		
PCB 15 (BZ)	9.8 U		20		
PCB 16 (BZ)	0.98 U		20		
PCB 17 (BZ)	0.98 U		20		
PCB 18 (BZ)	1.6	C J B	40		
PCB 19 (BZ)	0.98 U		20		
PCB 20 (BZ)	4.2	C J Q B	40		
PCB 21 (BZ)	2.0 U	C J B	40		
PCB 22 (BZ)	0.98 U		20		
PCB 23 (BZ)	0.98 U		20		
PCB 24 (BZ)	0.98 U		20		
PCB 25 (BZ)	0.98 U		20		
PCB 26 (BZ)	0.67	C J	40		
PCB 27 (BZ)	0.98 U		20		
PCB 28 (BZ)	4.2	C J Q B	40		
PCB 29 (BZ)	0.67	C J	40		
PCB 30 (BZ)	1.6	C J B	40		
PCB 31 (BZ)	2.5	J B	20		
PCB 32 (BZ)	0.98 U		20		
PCB 33 (BZ)	2.0 U	C J B	40		
PCB 34 (BZ)	0.98 U		20		
PCB 35 (BZ)	2.0 U		20		
PCB 36 (BZ)	0.98 U		20		
PCB 37 (BZ)	0.98 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.98 U		20		
PCB 39 (BZ)	0.98 U		20		
PCB 40 (BZ)	0.84	C J Q	40		
PCB 41 (BZ)	0.98 U		20		
PCB 42 (BZ)	0.98 U		20		
PCB 43 (BZ)	0.98 U		20		
PCB 44 (BZ)	13	C J B	59		
PCB 45 (BZ)	0.98 U		20		
PCB 46 (BZ)	0.98 U		20		
PCB 47 (BZ)	13	C J B	59		
PCB 48 (BZ)	0.98 U		20		
PCB 49 (BZ)	5.3	C J B	40		
PCB 50 (BZ)	2.0 U		40		
PCB 51 (BZ)	1.6	J	20		
PCB 52 (BZ)	14	J B	20		
PCB 53 (BZ)	2.0 U		40		
PCB 54 (BZ)	0.98 U		20		
PCB 55 (BZ)	2.0 U		20		
PCB 56 (BZ)	0.98 U		20		
PCB 57 (BZ)	0.98 U		20		
PCB 58 (BZ)	0.98 U		20		
PCB 59 (BZ)	2.9 U		59		
PCB 60 (BZ)	2.0 U		20		
PCB 61 (BZ)	15	C J B	79		
PCB 62 (BZ)	2.9 U		59		
PCB 63 (BZ)	0.98 U		20		
PCB 64 (BZ)	1.9	J	20		
PCB 65 (BZ)	13	C J B	59		
PCB 66 (BZ)	8.0	J Q	20		
PCB 67 (BZ)	0.98 U		20		
PCB 68 (BZ)	2.0 U		20		
PCB 69 (BZ)	5.3	C J B	40		
PCB 70 (BZ)	15	C J B	79		
PCB 71 (BZ)	0.84	C J Q	40		
PCB 72 (BZ)	0.98 U		20		
PCB 73 (BZ)	0.98 U		20		
PCB 74 (BZ)	15	C J B	79		

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	2.9 U		59		
PCB 76 (BZ)	15	C J B	79		
PCB 77 (BZ)	0.98 U		2.0	0.0001	0.000098
PCB 78 (BZ)	0.98 U		20		
PCB 79 (BZ)	0.98 U		20		
PCB 80 (BZ)	0.98 U		20		
PCB 81 (BZ)	0.98 U		2.0	0.0003	0.00029
PCB 82 (BZ)	0.98 U		20		
PCB 83 (BZ)	0.98 U		20		
PCB 84 (BZ)	2.3	J Q	20		
PCB 85 (BZ)	3.4	C J Q	59		
PCB 86 (BZ)	9.8	C J	120		
PCB 87 (BZ)	9.8	C J	120		
PCB 88 (BZ)	2.2	C J	40		
PCB 89 (BZ)	0.98 U		20		
PCB 90 (BZ)	28	C J B	59		
PCB 91 (BZ)	2.2	C J	40		
PCB 92 (BZ)	4.8	J Q	20		
PCB 93 (BZ)	2.0 U		40		
PCB 94 (BZ)	0.98 U		20		
PCB 95 (BZ)	11	J B	20		
PCB 96 (BZ)	0.98 U		20		
PCB 97 (BZ)	9.8	C J	120		
PCB 98 (BZ)	2.0 U		40		
PCB 99 (BZ)	20	J	20		
PCB 100 (BZ)	2.0 U		40		
PCB 101 (BZ)	28	C J B	59		
PCB 102 (BZ)	2.0 U		40		
PCB 103 (BZ)	0.98 U		20		
PCB 104 (BZ)	0.98 U		20		
PCB 105 (BZ)	13	B	2.0	0.00003	0.00039
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	2.1	J Q	20		
PCB 108 (BZ)/107 (IUPAC)	5.9 U		40		
PCB 109 (BZ)/108 (IUPAC)	9.8	C J	120		
PCB 110 (BZ)	19	C J B	40		
PCB 111 (BZ)	0.98 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.98 U		20		
PCB 113 (BZ)	28	C J B	59		
PCB 114 (BZ)	0.98 U		2.0	0.00003	0.000029
PCB 115 (BZ)	19	C J B	40		
PCB 116 (BZ)	3.4	C J Q	59		
PCB 117 (BZ)	3.4	C J Q	59		
PCB 118 (BZ)	34	B	2.0	0.00003	0.0010
PCB 119 (BZ)	9.8	C J	120		
PCB 120 (BZ)	0.98 U		20		
PCB 121 (BZ)	0.98 U		20		
PCB 122 (BZ)	0.98 U		20		
PCB 123 (BZ)	0.98 U		2.0	0.00003	0.000029
PCB 124 (BZ)	2.0 U		40		
PCB 125 (BZ)	9.8	C J	120		
PCB 126 (BZ)	0.98 U		2.0	0.1	0.098
PCB 127 (BZ)	0.98 U		20		
PCB 128 (BZ)	6.5	C J	40		
PCB 129 (BZ)	45	C	59		
PCB 130 (BZ)	0.98 U		20		
PCB 131 (BZ)	0.98 U		20		
PCB 132 (BZ)	3.2	J	20		
PCB 133 (BZ)	0.98 U		20		
PCB 134 (BZ)	2.0 U		40		
PCB 135 (BZ)	3.6	C J Q	40		
PCB 136 (BZ)	0.98 U		20		
PCB 137 (BZ)	0.98 U		20		
PCB 138 (BZ)	45	C	59		
PCB 139 (BZ)	2.0 U		40		
PCB 140 (BZ)	2.0 U		40		
PCB 141 (BZ)	3.6	J Q	20		
PCB 142 (BZ)	0.98 U		20		
PCB 143 (BZ)	2.0 U		40		
PCB 144 (BZ)	0.98 U		20		
PCB 145 (BZ)	0.98 U		20		
PCB 146 (BZ)	9.4	J	20		
PCB 147 (BZ)	8.2	C J	40		
PCB 148 (BZ)	0.98 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	8.2	C J	40		
PCB 150 (BZ)	0.98 U		20		
PCB 151 (BZ)	3.6	C J Q	40		
PCB 152 (BZ)	0.98 U		20		
PCB 153 (BZ)	51	C	40		
PCB 154 (BZ)	0.98 U		20		
PCB 155 (BZ)	0.98 U		20		
PCB 156 (BZ)	5.7	C	4.0	0.00003	0.00017
PCB 157 (BZ)	5.7	C	4.0	0.00003	0.00017
PCB 158 (BZ)	3.6	J Q	20		
PCB 159 (BZ)	0.98 U		20		
PCB 160 (BZ)	0.98 U		20		
PCB 161 (BZ)	0.98 U		20		
PCB 162 (BZ)	0.98 U		20		
PCB 163 (BZ)	45	C	59		
PCB 164 (BZ)	0.98 U		20		
PCB 165 (BZ)	0.98 U		20		
PCB 166 (BZ)	6.5	C J	40		
PCB 167 (BZ)	2.0	J Q	2.0	0.00003	0.000060
PCB 168 (BZ)	51	C	40		
PCB 169 (BZ)	0.98 U		2.0	0.03	0.029
PCB 170 (BZ)	13	J	20		
PCB 171 (BZ)	2.4	C J Q	40		
PCB 172 (BZ)	3.3	J	20		
PCB 173 (BZ)	2.4	C J Q	40		
PCB 174 (BZ)	2.3	J Q	20		
PCB 175 (BZ)	0.98 U		20		
PCB 176 (BZ)	0.98 U		20		
PCB 177 (BZ)	3.4	J	20		
PCB 178 (BZ)	0.98 U		20		
PCB 179 (BZ)	0.98 U		20		
PCB 180 (BZ)	26	C	40		
PCB 181 (BZ)	2.0 U		20		
PCB 182 (BZ)	0.98 U		20		
PCB 183 (BZ)	5.6	J Q	20		
PCB 184 (BZ)	0.98 U		20		
PCB 185 (BZ)	2.0 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	Work Order #....:	MQN8C1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.98 U		20		
PCB 187 (BZ)	19	J	20		
PCB 188 (BZ)	0.98 U		20		
PCB 189 (BZ)	0.98 U		2.0	0.00003	0.000029
PCB 190 (BZ)	0.98 U		20		
PCB 191 (BZ)	0.98 U		20		
PCB 192 (BZ)	0.98 U		20		
PCB 193 (BZ)	26	C	40		
PCB 194 (BZ)	3.7	J	20		
PCB 195 (BZ)	0.98 U		20		
PCB 196 (BZ)	4.4	J	20		
PCB 197 (BZ)	1.2	J	20		
PCB 198 (BZ)	16	C J	40		
PCB 199 (BZ)/200 (IUPAC)	2.0 U		20		
PCB 200 (BZ)/201 (IUPAC)	2.0	J Q	20		
PCB 201 (BZ)/199 (IUPAC)	16	C J	40		
PCB 202 (BZ)	2.6	J	20		
PCB 203 (BZ)	3.2	J	20		
PCB 204 (BZ)	0.98 U		20		
PCB 205 (BZ)	0.98 U		20		
PCB 206 (BZ)	6.3	J	20		
PCB 207 (BZ)	2.0	J Q	20		
PCB 208 (BZ)	5.0	J	20		
PCB 209 (BZ)	4.5	J Q	20		
Monochlorobiphenyl (total)	ND		20		0
Dichlorobiphenyl (total)	ND		20		0
Trichlorobiphenyl (total)	11		20		
Tetrachlorobiphenyl (total)	60		20		
Pentachlorobiphenyl (total)	150		20		
Hexachlorobiphenyl (total)	140		20		
Heptachlorobiphenyl (total)	75		20		
Octachlorobiphenyl (total)	33		20		
Nonachlorobiphenyl (total)	13		20		
Total TEQ Concentration					0.13

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_01.prt 3/27/2012

391

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	**Work Order #....:**	MQN8C1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	50		5.0 - 145
13C12-PCB 3	55		5.0 - 145
13C12-PCB 4	47		5.0 - 145
13C12-PCB 15	67		5.0 - 145
13C12-PCB 19	55		5.0 - 145
13C12-PCB 37	82		5.0 - 145
13C12-PCB 54	50		5.0 - 145
13C12-PCB 77	87		10 - 145
13C12-PCB 81	84		10 - 145
13C12-PCB 104	65		10 - 145
13C12-PCB 105	79		10 - 145
13C12-PCB 114	88		10 - 145
13C12-PCB 118	91		10 - 145
13C12-PCB 123	89		10 - 145
13C12-PCB 126	88		10 - 145
13C12-PCB 155	82		10 - 145
13C12-PCB 156	111	C	10 - 145
13C12-PCB 157	111	C	10 - 145
13C12-PCB 167	108		10 - 145
13C12-PCB 169	105		10 - 145
13C12-PCB 188	106		10 - 145
13C12-PCB 189	122		10 - 145
13C12-PCB 202	110		10 - 145
13C12-PCB 205	96		10 - 145
13C12-PCB 206	96		10 - 145
13C12-PCB 208	113		10 - 145
13C12-PCB 209	87		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	80	5.0 - 145
13C12-PCB 178	86	10 - 145
13C12-PCB 111	87	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 007	**Work Order #....:**	MQN8C1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	1.9 U		19		
PCB 2 (BZ)	1.9 U		19		
PCB 3 (BZ)	0.95 U		19		
PCB 4 (BZ)	9.5 U		19		
PCB 5 (BZ)	9.5 U		19		
PCB 6 (BZ)	9.5 U		19		
PCB 7 (BZ)	9.5 U		19		
PCB 8 (BZ)	9.5 U		19		
PCB 9 (BZ)	9.5 U		19		
PCB 10 (BZ)	9.5 U		19		
PCB 11 (BZ)	8.2	J B	19		
PCB 12 (BZ)	19 U		38		
PCB 13 (BZ)	19 U		38		
PCB 14 (BZ)	9.5 U		19		
PCB 15 (BZ)	9.5 U		19		
PCB 16 (BZ)	0.95 U		19		
PCB 17 (BZ)	0.95 U		19		
PCB 18 (BZ)	1.1	C J B	38		
PCB 19 (BZ)	0.95 U		19		
PCB 20 (BZ)	3.8	C J B	38		
PCB 21 (BZ)	1.9 U	C J B	38		
PCB 22 (BZ)	1.1	J	19		
PCB 23 (BZ)	0.95 U		19		
PCB 24 (BZ)	0.95 U		19		
PCB 25 (BZ)	0.95 U		19		
PCB 26 (BZ)	0.78	C J	38		
PCB 27 (BZ)	0.95 U		19		
PCB 28 (BZ)	3.8	C J B	38		
PCB 29 (BZ)	0.78	C J	38		
PCB 30 (BZ)	1.1	C J B	38		
PCB 31 (BZ)	2.8	J B	19		
PCB 32 (BZ)	0.95 U		19		
PCB 33 (BZ)	1.9 U	C J B	38		
PCB 34 (BZ)	0.95 U		19		
PCB 35 (BZ)	1.9 U		19		
PCB 36 (BZ)	0.95 U		19		
PCB 37 (BZ)	0.95 U		19		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.95 U		19		
PCB 39 (BZ)	0.95 U		19		
PCB 40 (BZ)	1.0	C J	38		
PCB 41 (BZ)	0.95 U		19		
PCB 42 (BZ)	0.95 U		19		
PCB 43 (BZ)	0.95 U		19		
PCB 44 (BZ)	11	C J B	57		
PCB 45 (BZ)	0.95 U		19		
PCB 46 (BZ)	0.95 U		19		
PCB 47 (BZ)	11	C J B	57		
PCB 48 (BZ)	0.95 U		19		
PCB 49 (BZ)	3.7	C J B	38		
PCB 50 (BZ)	1.9 U		38		
PCB 51 (BZ)	1.3	J	19		
PCB 52 (BZ)	12	J B	19		
PCB 53 (BZ)	1.9 U		38		
PCB 54 (BZ)	0.95 U		19		
PCB 55 (BZ)	1.9 U		19		
PCB 56 (BZ)	0.95 U		19		
PCB 57 (BZ)	0.95 U		19		
PCB 58 (BZ)	0.95 U		19		
PCB 59 (BZ)	2.8 U		57		
PCB 60 (BZ)	1.9 U		19		
PCB 61 (BZ)	17	C J B	76		
PCB 62 (BZ)	2.8 U		57		
PCB 63 (BZ)	0.95 U		19		
PCB 64 (BZ)	1.9	J Q	19		
PCB 65 (BZ)	11	C J B	57		
PCB 66 (BZ)	10	J	19		
PCB 67 (BZ)	0.95 U		19		
PCB 68 (BZ)	1.9 U		19		
PCB 69 (BZ)	3.7	C J B	38		
PCB 70 (BZ)	17	C J B	76		
PCB 71 (BZ)	1.0	C J	38		
PCB 72 (BZ)	0.95 U		19		
PCB 73 (BZ)	0.95 U		19		
PCB 74 (BZ)	17	C J B	76		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	2.8 U		57		
PCB 76 (BZ)	17	C J B	76		
PCB 77 (BZ)	0.95 U		1.9	0.0001	0.000095
PCB 78 (BZ)	0.95 U		19		
PCB 79 (BZ)	0.95 U		19		
PCB 80 (BZ)	0.95 U		19		
PCB 81 (BZ)	0.95 U		1.9	0.0003	0.00029
PCB 82 (BZ)	0.95 U		19		
PCB 83 (BZ)	0.95 U		19		
PCB 84 (BZ)	0.95 U		19		
PCB 85 (BZ)	3.9	C J Q	57		
PCB 86 (BZ)	7.8	C J	110		
PCB 87 (BZ)	7.8	C J	110		
PCB 88 (BZ)	1.9 U		38		
PCB 89 (BZ)	0.95 U		19		
PCB 90 (BZ)	26	C J B	57		
PCB 91 (BZ)	1.9 U		38		
PCB 92 (BZ)	4.6	J Q	19		
PCB 93 (BZ)	1.9 U		38		
PCB 94 (BZ)	0.95 U		19		
PCB 95 (BZ)	7.5	J B	19		
PCB 96 (BZ)	0.95 U		19		
PCB 97 (BZ)	7.8	C J	110		
PCB 98 (BZ)	1.9 U		38		
PCB 99 (BZ)	21		19		
PCB 100 (BZ)	1.9 U		38		
PCB 101 (BZ)	26	C J B	57		
PCB 102 (BZ)	1.9 U		38		
PCB 103 (BZ)	0.95 U		19		
PCB 104 (BZ)	0.95 U		19		
PCB 105 (BZ)	14	B	1.9	0.00003	0.00042
PCB 106 (BZ)	1.9 U		19		
PCB 107 (BZ)/109 (IUPAC)	3.2	J	19		
PCB 108 (BZ)/107 (IUPAC)	5.7 U		38		
PCB 109 (BZ)/108 (IUPAC)	7.8	C J	110		
PCB 110 (BZ)	12	C J B	38		
PCB 111 (BZ)	0.95 U		19		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.95 U		19		
PCB 113 (BZ)	26	C J B	57		
PCB 114 (BZ)	0.95 U		1.9	0.00003	0.000029
PCB 115 (BZ)	12	C J B	38		
PCB 116 (BZ)	3.9	C J Q	57		
PCB 117 (BZ)	3.9	C J Q	57		
PCB 118 (BZ)	39	B	1.9	0.00003	0.0012
PCB 119 (BZ)	7.8	C J	110		
PCB 120 (BZ)	0.95 U		19		
PCB 121 (BZ)	0.95 U		19		
PCB 122 (BZ)	0.95 U		19		
PCB 123 (BZ)	0.95 U		1.9	0.00003	0.000029
PCB 124 (BZ)	1.9 U		38		
PCB 125 (BZ)	7.8	C J	110		
PCB 126 (BZ)	0.95 U		1.9	0.1	0.095
PCB 127 (BZ)	0.95 U		19		
PCB 128 (BZ)	5.7	C J Q	38		
PCB 129 (BZ)	48	C J	57		
PCB 130 (BZ)	2.2	J Q	19		
PCB 131 (BZ)	0.95 U		19		
PCB 132 (BZ)	1.9	J	19		
PCB 133 (BZ)	0.95 U		19		
PCB 134 (BZ)	1.9 U		38		
PCB 135 (BZ)	3.3	C J	38		
PCB 136 (BZ)	0.95 U		19		
PCB 137 (BZ)	1.1	J Q	19		
PCB 138 (BZ)	48	C J	57		
PCB 139 (BZ)	1.9 U		38		
PCB 140 (BZ)	1.9 U		38		
PCB 141 (BZ)	4.8	J	19		
PCB 142 (BZ)	0.95 U		19		
PCB 143 (BZ)	1.9 U		38		
PCB 144 (BZ)	0.95 U		19		
PCB 145 (BZ)	0.95 U		19		
PCB 146 (BZ)	9.4	J	19		
PCB 147 (BZ)	6.8	C J	38		
PCB 148 (BZ)	0.95 U		19		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.95	Units....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	6.8	C J	38		
PCB 150 (BZ)	0.95 U		19		
PCB 151 (BZ)	3.3	C J	38		
PCB 152 (BZ)	0.95 U		19		
PCB 153 (BZ)	50	C	38		
PCB 154 (BZ)	0.95 U		19		
PCB 155 (BZ)	0.95 U		19		
PCB 156 (BZ)	5.0	C	3.8	0.00003	0.00015
PCB 157 (BZ)	5.0	C	3.8	0.00003	0.00015
PCB 158 (BZ)	4.7	J	19		
PCB 159 (BZ)	0.95 U		38		
PCB 160 (BZ)	0.95 U		19		
PCB 161 (BZ)	0.95 U		19		
PCB 162 (BZ)	0.95 U		19		
PCB 163 (BZ)	48	C J	57		
PCB 164 (BZ)	1.0	J	19		
PCB 165 (BZ)	0.95 U		19		
PCB 166 (BZ)	5.7	C J Q	19		
PCB 167 (BZ)	2.5	Q	1.9	0.00003	0.000075
PCB 168 (BZ)	50	C	38		
PCB 169 (BZ)	0.95 U		1.9	0.03	0.028
PCB 170 (BZ)	15	J	19		
PCB 171 (BZ)	3.6	C J Q	38		
PCB 172 (BZ)	4.4	J Q	19		
PCB 173 (BZ)	3.6	C J Q	38		
PCB 174 (BZ)	2.5	J	19		
PCB 175 (BZ)	0.95 U		19		
PCB 176 (BZ)	0.95 U		19		
PCB 177 (BZ)	4.7	J	19		
PCB 178 (BZ)	2.3	J	19		
PCB 179 (BZ)	0.95 U		19		
PCB 180 (BZ)	32	C J	38		
PCB 181 (BZ)	1.9 U		19		
PCB 182 (BZ)	0.95 U		19		
PCB 183 (BZ)	7.1	J	19		
PCB 184 (BZ)	0.95 U		19		
PCB 185 (BZ)	1.9 U		19		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.95 U		19		
PCB 187 (BZ)	18	J	19		
PCB 188 (BZ)	0.95 U		19		
PCB 189 (BZ)	0.95 U		1.9	0.00003	0.000029
PCB 190 (BZ)	1.0	J Q	19		
PCB 191 (BZ)	0.95 U		19		
PCB 192 (BZ)	0.95 U		19		
PCB 193 (BZ)	32	C J	38		
PCB 194 (BZ)	2.9	J Q	19		
PCB 195 (BZ)	0.95 U		19		
PCB 196 (BZ)	4.1	J Q	19		
PCB 197 (BZ)	0.83	J	19		
PCB 198 (BZ)	17	C J	38		
PCB 199 (BZ)/200 (IUPAC)	1.9 U		19		
PCB 200 (BZ)/201 (IUPAC)	2.6	J	19		
PCB 201 (BZ)/199 (IUPAC)	17	C J	38		
PCB 202 (BZ)	3.0	J Q	19		
PCB 203 (BZ)	3.7	J	19		
PCB 204 (BZ)	0.95 U		19		
PCB 205 (BZ)	0.95 U		19		
PCB 206 (BZ)	5.0	J Q	19		
PCB 207 (BZ)	2.0	J	19		
PCB 208 (BZ)	5.2	J	19		
PCB 209 (BZ)	5.3	J	19		
Monochlorobiphenyl (total)	ND		19		0
Dichlorobiphenyl (total)	8.2		19		
Trichlorobiphenyl (total)	11		19		
Tetrachlorobiphenyl (total)	57		19		
Pentachlorobiphenyl (total)	140		19		
Hexachlorobiphenyl (total)	150		19		
Heptachlorobiphenyl (total)	91		19		
Octachlorobiphenyl (total)	34		19		
Nonachlorobiphenyl (total)	12		19		
Total TEQ Concentration					0.13

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.95	**Units.....:**	pg/g
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	46		5.0 - 145
13C12-PCB 3	48		5.0 - 145
13C12-PCB 4	41		5.0 - 145
13C12-PCB 15	63		5.0 - 145
13C12-PCB 19	49		5.0 - 145
13C12-PCB 37	77		5.0 - 145
13C12-PCB 54	44		5.0 - 145
13C12-PCB 77	82		10 - 145
13C12-PCB 81	81		10 - 145
13C12-PCB 104	55		10 - 145
13C12-PCB 105	77		10 - 145
13C12-PCB 114	80		10 - 145
13C12-PCB 118	77		10 - 145
13C12-PCB 123	78		10 - 145
13C12-PCB 126	78		10 - 145
13C12-PCB 155	71		10 - 145
13C12-PCB 156	95	C	10 - 145
13C12-PCB 157	95	C	10 - 145
13C12-PCB 167	96		10 - 145
13C12-PCB 169	86		10 - 145
13C12-PCB 188	159	*	10 - 145
13C12-PCB 189	156	*	10 - 145
13C12-PCB 202	170	*	10 - 145
13C12-PCB 205	104		10 - 145
13C12-PCB 206	117		10 - 145
13C12-PCB 208	151	*	10 - 145
13C12-PCB 209	113		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	72	5.0 - 145
13C12-PCB 178	74	10 - 145
13C12-PCB 111	79	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.95	**Units.....:**	pg/g
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

*	Surrogate recovery is outside stated control limits.
B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.75	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	9.5 U		96		
PCB 2 (BZ)	9.5 U		96		
PCB 3 (BZ)	4.8 U		96		
PCB 4 (BZ)	48 U		96		
PCB 5 (BZ)	48 U		96		
PCB 6 (BZ)	48 U		96		
PCB 7 (BZ)	48 U		96		
PCB 8 (BZ)	48 U		96		
PCB 9 (BZ)	48 U		96		
PCB 10 (BZ)	48 U		96		
PCB 11 (BZ)	48 U		96		
PCB 12 (BZ)	95 U		190		
PCB 13 (BZ)	95 U		190		
PCB 14 (BZ)	48 U		96		
PCB 15 (BZ)	48 U		96		
PCB 16 (BZ)	4.8 U		96		
PCB 17 (BZ)	4.8 U		96		
PCB 18 (BZ)	9.5 U		190		
PCB 19 (BZ)	4.8 U		96		
PCB 20 (BZ)	6.7	C J B	190		
PCB 21 (BZ)	9.5 U		190		
PCB 22 (BZ)	4.8 U		96		
PCB 23 (BZ)	4.8 U		96		
PCB 24 (BZ)	4.8 U		96		
PCB 25 (BZ)	4.8 U		96		
PCB 26 (BZ)	9.5 U		190		
PCB 27 (BZ)	4.8 U		96		
PCB 28 (BZ)	6.7	C J B	190		
PCB 29 (BZ)	9.5 U		190		
PCB 30 (BZ)	9.5 U		190		
PCB 31 (BZ)	3.8	J Q B	96		
PCB 32 (BZ)	4.8 U		96		
PCB 33 (BZ)	9.5 U		190		
PCB 34 (BZ)	4.8 U		96		
PCB 35 (BZ)	9.5 U		96		
PCB 36 (BZ)	4.8 U		96		
PCB 37 (BZ)	4.8 U		96		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.75	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	4.8 U		96		
PCB 39 (BZ)	4.8 U		96		
PCB 40 (BZ)	9.5 U		190		
PCB 41 (BZ)	4.8 U		96		
PCB 42 (BZ)	4.8 U		96		
PCB 43 (BZ)	4.8 U		96		
PCB 44 (BZ)	11	C J Q B	290		
PCB 45 (BZ)	4.8 U		96		
PCB 46 (BZ)	4.8 U		96		
PCB 47 (BZ)	11	C J Q B	290		
PCB 48 (BZ)	4.8 U		96		
PCB 49 (BZ)	5.1	C J B	190		
PCB 50 (BZ)	9.5 U		190		
PCB 51 (BZ)	4.8 U		96		
PCB 52 (BZ)	14	J B	96		
PCB 53 (BZ)	9.5 U		190		
PCB 54 (BZ)	4.8 U		96		
PCB 55 (BZ)	9.5 U		96		
PCB 56 (BZ)	4.8 U		96		
PCB 57 (BZ)	4.8 U		96		
PCB 58 (BZ)	4.8 U		96		
PCB 59 (BZ)	14 U		290		
PCB 60 (BZ)	9.5 U		96		
PCB 61 (BZ)	18	C J B	380		
PCB 62 (BZ)	14 U		290		
PCB 63 (BZ)	4.8 U		96		
PCB 64 (BZ)	4.8 U		96		
PCB 65 (BZ)	11	C J Q B	290		
PCB 66 (BZ)	7.7	J Q	96		
PCB 67 (BZ)	4.8 U		96		
PCB 68 (BZ)	9.5 U		96		
PCB 69 (BZ)	5.1	C J B	190		
PCB 70 (BZ)	18	C J B	380		
PCB 71 (BZ)	9.5 U		190		
PCB 72 (BZ)	4.8 U		96		
PCB 73 (BZ)	4.8 U		96		
PCB 74 (BZ)	18	C J B	380		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.75	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	14 U		290		
PCB 76 (BZ)	18	C J B	380		
PCB 77 (BZ)	4.8 U		9.6	0.0001	0.00048
PCB 78 (BZ)	4.8 U		96		
PCB 79 (BZ)	4.8 U		96		
PCB 80 (BZ)	4.8 U		96		
PCB 81 (BZ)	4.8 U		9.6	0.0003	0.0014
PCB 82 (BZ)	4.8 U		96		
PCB 83 (BZ)	4.8 U		96		
PCB 84 (BZ)	4.8 U		96		
PCB 85 (BZ)	14 U		290		
PCB 86 (BZ)	5.6	C J Q	570		
PCB 87 (BZ)	5.6	C J Q	570		
PCB 88 (BZ)	9.5 U		190		
PCB 89 (BZ)	4.8 U		96		
PCB 90 (BZ)	25	C J B	290		
PCB 91 (BZ)	9.5 U		190		
PCB 92 (BZ)	4.8 U		96		
PCB 93 (BZ)	9.5 U		190		
PCB 94 (BZ)	4.8 U		96		
PCB 95 (BZ)	7.6	J Q B	96		
PCB 96 (BZ)	4.8 U		96		
PCB 97 (BZ)	5.6	C J Q	570		
PCB 98 (BZ)	9.5 U		190		
PCB 99 (BZ)	21	J Q	96		
PCB 100 (BZ)	9.5 U		190		
PCB 101 (BZ)	25	C J B	290		
PCB 102 (BZ)	9.5 U		190		
PCB 103 (BZ)	4.8 U		96		
PCB 104 (BZ)	4.8 U		96		
PCB 105 (BZ)	15	B	9.6	0.00003	0.00045
PCB 106 (BZ)	9.5 U		96		
PCB 107 (BZ)/109 (IUPAC)	2.1	J Q	96		
PCB 108 (BZ)/107 (IUPAC)	28 U		190		
PCB 109 (BZ)/108 (IUPAC)	5.6	C J Q	570		
PCB 110 (BZ)	12	C J B	190		
PCB 111 (BZ)	4.8 U		96		

404

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.75	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	4.8 U		96		
PCB 113 (BZ)	25	C J B	290		
PCB 114 (BZ)	4.8 U		9.6	0.00003	0.00014
PCB 115 (BZ)	12	C J B	190		
PCB 116 (BZ)	14 U		290		
PCB 117 (BZ)	14 U		290		
PCB 118 (BZ)	39	B	9.6	0.00003	0.0012
PCB 119 (BZ)	5.6	C J Q	570		
PCB 120 (BZ)	4.8 U		96		
PCB 121 (BZ)	4.8 U		96		
PCB 122 (BZ)	4.8 U		96		
PCB 123 (BZ)	4.8 U		9.6	0.00003	0.00014
PCB 124 (BZ)	9.5 U		190		
PCB 125 (BZ)	5.6	C J Q	570		
PCB 126 (BZ)	4.8 U		9.6	0.1	0.48
PCB 127 (BZ)	4.8 U		96		
PCB 128 (BZ)	9.5 U		190		
PCB 129 (BZ)	48	C J	290		
PCB 130 (BZ)	4.8 U		96		
PCB 131 (BZ)	4.8 U		96		
PCB 132 (BZ)	4.8 U		96		
PCB 133 (BZ)	4.8 U		96		
PCB 134 (BZ)	9.5 U		190		
PCB 135 (BZ)	9.5 U		1900		
PCB 136 (BZ)	4.8 U		96		
PCB 137 (BZ)	4.8 U		96		
PCB 138 (BZ)	48	C J	290		
PCB 139 (BZ)	9.5 U		190		
PCB 140 (BZ)	9.5 U		1700		
PCB 141 (BZ)	4.8 U		96		
PCB 142 (BZ)	4.8 U		96		
PCB 143 (BZ)	9.5 U		190		
PCB 144 (BZ)	4.8 U		96		
PCB 145 (BZ)	4.8 U		96		
PCB 146 (BZ)	9.0	J	96		
PCB 147 (BZ)	7.9	C J	190		
PCB 148 (BZ)	4.8 U		96		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.75	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	7.9	C J	190		
PCB 150 (BZ)	4.8 U		96		
PCB 151 (BZ)	9.5 U		190		
PCB 152 (BZ)	4.8 U		96		
PCB 153 (BZ)	50	C J	190		
PCB 154 (BZ)	4.8 U		96		
PCB 155 (BZ)	4.8 U		96		
PCB 156 (BZ)	5.6	C J	19	0.00003	0.00017
PCB 157 (BZ)	5.6	C J	19	0.00003	0.00017
PCB 158 (BZ)	4.8 U		96		
PCB 159 (BZ)	4.8 U		96		
PCB 160 (BZ)	4.8 U		96		
PCB 161 (BZ)	4.8 U		96		
PCB 162 (BZ)	4.8 U		96		
PCB 163 (BZ)	48	C J	290		
PCB 164 (BZ)	4.8 U		96		
PCB 165 (BZ)	4.8 U		96		
PCB 166 (BZ)	9.5 U		190		
PCB 167 (BZ)	4.8 U		9.6	0.00003	0.00014
PCB 168 (BZ)	50	C J	190		
PCB 169 (BZ)	4.8 U		9.6	0.03	0.14
PCB 170 (BZ)	13	J	96		
PCB 171 (BZ)	9.5 U		190		
PCB 172 (BZ)	4.8 U		96		
PCB 173 (BZ)	9.5 U		190		
PCB 174 (BZ)	4.8 U		96		
PCB 175 (BZ)	4.8 U		96		
PCB 176 (BZ)	4.8 U		96		
PCB 177 (BZ)	4.8 U		96		
PCB 178 (BZ)	4.8 U		96		
PCB 179 (BZ)	4.8 U		96		
PCB 180 (BZ)	27	C J	190		
PCB 181 (BZ)	9.5 U		96		
PCB 182 (BZ)	4.8 U		96		
PCB 183 (BZ)	4.7	J Q	96		
PCB 184 (BZ)	4.8 U		96		
PCB 185 (BZ)	9.5 U		96		

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.75	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	4.8 U		96		
PCB 187 (BZ)	14	J	96		
PCB 188 (BZ)	4.8 U		96		
PCB 189 (BZ)	4.8 U		9.6	0.00003	0.00014
PCB 190 (BZ)	4.8 U		96		
PCB 191 (BZ)	4.8 U		96		
PCB 192 (BZ)	4.8 U		96		
PCB 193 (BZ)	27	C J	190		
PCB 194 (BZ)	4.8 U		96		
PCB 195 (BZ)	4.8 U		96		
PCB 196 (BZ)	5.6	J Q	96		
PCB 197 (BZ)	4.8 U		96		
PCB 198 (BZ)	17	C J	190		
PCB 199 (BZ)/200 (IUPAC)	9.5 U		96		
PCB 200 (BZ)/201 (IUPAC)	2.0	J Q	96		
PCB 201 (BZ)/199 (IUPAC)	17	C J	190		
PCB 202 (BZ)	4.3	J	96		
PCB 203 (BZ)	4.8 U		96		
PCB 204 (BZ)	4.8 U		96		
PCB 205 (BZ)	4.8 U		96		
PCB 206 (BZ)	4.8 U		96		
PCB 207 (BZ)	4.8 U		96		
PCB 208 (BZ)	4.8 U		96		
PCB 209 (BZ)	4.4	J Q	96		
Monochlorobiphenyl (total)	ND		96		0
Dichlorobiphenyl (total)	ND		96		0
Trichlorobiphenyl (total)	11		96		
Tetrachlorobiphenyl (total)	55		96		
Pentachlorobiphenyl (total)	130		96		
Hexachlorobiphenyl (total)	120		96		
Heptachlorobiphenyl (total)	58		96		
Octachlorobiphenyl (total)	28		96		
Nonachlorobiphenyl (total)	ND		96		0
Total TEQ Concentration					**0.62**

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	Work Order #....:	MQN8D2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/22/12		
Prep Batch # ....:	2045127	Dilution Factor....:	4.75	Units.....:	pg/g
Initial Wgt/Vol :	10.47 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	48		5.0 - 145
13C12-PCB 3	53		5.0 - 145
13C12-PCB 4	43		5.0 - 145
13C12-PCB 15	57		5.0 - 145
13C12-PCB 19	56		5.0 - 145
13C12-PCB 37	74		5.0 - 145
13C12-PCB 54	46		5.0 - 145
13C12-PCB 77	75		10 - 145
13C12-PCB 81	75		10 - 145
13C12-PCB 104	61		10 - 145
13C12-PCB 105	76		10 - 145
13C12-PCB 114	74		10 - 145
13C12-PCB 118	79		10 - 145
13C12-PCB 123	77		10 - 145
13C12-PCB 126	73		10 - 145
13C12-PCB 155	75		10 - 145
13C12-PCB 156	101	C	10 - 145
13C12-PCB 157	101	C	10 - 145
13C12-PCB 167	98		10 - 145
13C12-PCB 169	98		10 - 145
13C12-PCB 188	69		10 - 145
13C12-PCB 189	90		10 - 145
13C12-PCB 202	73		10 - 145
13C12-PCB 205	78		10 - 145
13C12-PCB 206	74		10 - 145
13C12-PCB 208	77		10 - 145
13C12-PCB 209	71		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	80	5.0 - 145
13C12-PCB 178	76	10 - 145
13C12-PCB 111	80	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D2AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/22/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	4.75	**Units.....:**	pg/g
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland. June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	1.9 U		19		
PCB 2 (BZ)	3.9	J Q	19		
PCB 3 (BZ)	1.3	J Q	19		
PCB 4 (BZ)	9.6 U		19		
PCB 5 (BZ)	9.6 U		19		
PCB 6 (BZ)	9.6 U		19		
PCB 7 (BZ)	9.6 U		19		
PCB 8 (BZ)	9.6 U		19		
PCB 9 (BZ)	9.6 U		19		
PCB 10 (BZ)	9.6 U		19		
PCB 11 (BZ)	13	J B	19		
PCB 12 (BZ)	19 U		39		
PCB 13 (BZ)	19 U		39		
PCB 14 (BZ)	9.6 U		19		
PCB 15 (BZ)	9.6 U		19		
PCB 16 (BZ)	0.70	J	19		
PCB 17 (BZ)	0.74	J Q	19		
PCB 18 (BZ)	1.9	C J B	39		
PCB 19 (BZ)	0.96 U		19		
PCB 20 (BZ)	8.4	C J B	39		
PCB 21 (BZ)	1.8	C J B	39		
PCB 22 (BZ)	1.8	J Q	19		
PCB 23 (BZ)	0.96 U		19		
PCB 24 (BZ)	0.96 U		19		
PCB 25 (BZ)	0.96 U		19		
PCB 26 (BZ)	1.2	C J Q	39		
PCB 27 (BZ)	0.96 U		19		
PCB 28 (BZ)	8.4	C J B	39		
PCB 29 (BZ)	1.2	C J Q	39		
PCB 30 (BZ)	1.9	C J B	39		
PCB 31 (BZ)	6.4	J B	19		
PCB 32 (BZ)	0.93	J B	19		
PCB 33 (BZ)	1.8	C J B	39		
PCB 34 (BZ)	0.96 U		19		
PCB 35 (BZ)	1.9 U		19		
PCB 36 (BZ)	0.96 U		19		
PCB 37 (BZ)	1.1	J Q B	19		

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.96 U		19		
PCB 39 (BZ)	0.96 U		19		
PCB 40 (BZ)	2.1	C J Q	39		
PCB 41 (BZ)	0.96 U		19		
PCB 42 (BZ)	0.96 U	J Q	19		
PCB 43 (BZ)	0.96 U		19		
PCB 44 (BZ)	20	C J B	58		
PCB 45 (BZ)	0.96 U		19		
PCB 46 (BZ)	0.96 U		19		
PCB 47 (BZ)	20	C J B	58		
PCB 48 (BZ)	0.76	J	19		
PCB 49 (BZ)	11	C J B	39		
PCB 50 (BZ)	1.1	C J	39		
PCB 51 (BZ)	1.9	J	19		
PCB 52 (BZ)	34	B	19		
PCB 53 (BZ)	1.1	C J	39		
PCB 54 (BZ)	0.96 U		19		
PCB 55 (BZ)	1.9 U		19		
PCB 56 (BZ)	4.3	J	19		
PCB 57 (BZ)	0.96 U		19		
PCB 58 (BZ)	0.96 U		19		
PCB 59 (BZ)	0.73	C J Q	58		
PCB 60 (BZ)	3.5	J Q	19		
PCB 61 (BZ)	44	C J B	77		
PCB 62 (BZ)	0.73	C J Q	58		
PCB 63 (BZ)	0.98	J	19		
PCB 64 (BZ)	4.8	J	19		
PCB 65 (BZ)	20	C J B	58		
PCB 66 (BZ)	20		19		
PCB 67 (BZ)	0.96 U	J Q	19		
PCB 68 (BZ)	1.9 U	J Q	19		
PCB 69 (BZ)	11	C J B	39		
PCB 70 (BZ)	44	C J B	77		
PCB 71 (BZ)	2.1	C J Q	39		
PCB 72 (BZ)	0.69	J	19		
PCB 73 (BZ)	0.96 U		19		
PCB 74 (BZ)	44	C J B	77		

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	0.73	C J Q	58		
PCB 76 (BZ)	44	C J B	77		
PCB 77 (BZ)	2.0		1.9	0.0001	0.00020
PCB 78 (BZ)	0.96 U		19		
PCB 79 (BZ)	0.96 U		19		
PCB 80 (BZ)	0.96 U		19		
PCB 81 (BZ)	0.96 U		1.9	0.0003	0.00029
PCB 82 (BZ)	0.96 U		19		
PCB 83 (BZ)	2.4	J	19		
PCB 84 (BZ)	7.0	J	19		
PCB 85 (BZ)	11	C J	58		
PCB 86 (BZ)	34	C J	120		
PCB 87 (BZ)	34	C J	120		
PCB 88 (BZ)	6.6	C J	39		
PCB 89 (BZ)	0.96 U		19		
PCB 90 (BZ)	90	C B	58		
PCB 91 (BZ)	6.6	C J	39		
PCB 92 (BZ)	16	J	19		
PCB 93 (BZ)	1.9 U	C J Q	39		
PCB 94 (BZ)	0.96 U		19		
PCB 95 (BZ)	35	B	19		
PCB 96 (BZ)	0.96 U		19		
PCB 97 (BZ)	34	C J	120		
PCB 98 (BZ)	1.9 U		39		
PCB 99 (BZ)	43		19		
PCB 100 (BZ)	1.9 U	C J Q	39		
PCB 101 (BZ)	90	C B	58		
PCB 102 (BZ)	1.9 U		39		
PCB 103 (BZ)	0.96 U	J Q	19		
PCB 104 (BZ)	0.96 U		19		
PCB 105 (BZ)	20	B	1.9	0.00003	0.00060
PCB 106 (BZ)	1.9 U		19		
PCB 107 (BZ)/109 (IUPAC)	4.5	J	19		
PCB 108 (BZ)/107 (IUPAC)	2.1	C J	39		
PCB 109 (BZ)/108 (IUPAC)	34	C J	120		
PCB 110 (BZ)	65	C B	39		
PCB 111 (BZ)	0.96 U		19		

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.96 U		19		
PCB 113 (BZ)	90	C B	58		
PCB 114 (BZ)	0.90	J	1.9	0.00003	0.000027
PCB 115 (BZ)	65	C B	39		
PCB 116 (BZ)	11	C J	58		
PCB 117 (BZ)	11	C J	58		
PCB 118 (BZ)	60	B	1.9	0.00003	0.0018
PCB 119 (BZ)	34	C J	120		
PCB 120 (BZ)	0.93	J	19		
PCB 121 (BZ)	0.96 U		19		
PCB 122 (BZ)	0.96 U		19		
PCB 123 (BZ)	0.91	J	1.9	0.00003	0.000027
PCB 124 (BZ)	2.1	C J	39		
PCB 125 (BZ)	34	C J	120		
PCB 126 (BZ)	0.96 U		1.9	0.1	0.096
PCB 127 (BZ)	0.96 U		19		
PCB 128 (BZ)	8.2	C J	39		
PCB 129 (BZ)	65	C	58		
PCB 130 (BZ)	4.1	J	19		
PCB 131 (BZ)	0.96 U		19		
PCB 132 (BZ)	7.8	J	19		
PCB 133 (BZ)	2.1	J	19		
PCB 134 (BZ)	1.3	C J	39		
PCB 135 (BZ)	15	C J	39		
PCB 136 (BZ)	4.8	J	19		
PCB 137 (BZ)	2.1	J	19		
PCB 138 (BZ)	65	C	58		
PCB 139 (BZ)	1.4	C J	39		
PCB 140 (BZ)	1.4	C J	39		
PCB 141 (BZ)	9.2	J	19		
PCB 142 (BZ)	0.96 U		19		
PCB 143 (BZ)	1.3	C J	39		
PCB 144 (BZ)	2.2	J	19		
PCB 145 (BZ)	0.96 U		19		
PCB 146 (BZ)	13	J	19		
PCB 147 (BZ)	27	C J	39		
PCB 148 (BZ)	0.96 U		19		

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	27	C J	39		
PCB 150 (BZ)	0.96 U		19		
PCB 151 (BZ)	15	C J	39		
PCB 152 (BZ)	0.96 U		19		
PCB 153 (BZ)	75	C	39		
PCB 154 (BZ)	2.0	J	19		
PCB 155 (BZ)	0.96 U		19		
PCB 156 (BZ)	6.2	C	3.9	0.00003	0.00019
PCB 157 (BZ)	6.2	C	3.9	0.00003	0.00019
PCB 158 (BZ)	6.1	J	19		
PCB 159 (BZ)	0.96 U		19		
PCB 160 (BZ)	0.96 U		19		
PCB 161 (BZ)	0.96 U		19		
PCB 162 (BZ)	0.96 U	J Q	19		
PCB 163 (BZ)	65	C	58		
PCB 164 (BZ)	2.6	J	19		
PCB 165 (BZ)	0.96 U		19		
PCB 166 (BZ)	8.2	C J	39		
PCB 167 (BZ)	3.3		1.9	0.00003	0.000099
PCB 168 (BZ)	75	C	39		
PCB 169 (BZ)	0.96 U		1.9	0.03	0.029
PCB 170 (BZ)	16	J	19		
PCB 171 (BZ)	5.9	C J	39		
PCB 172 (BZ)	4.1	J	19		
PCB 173 (BZ)	5.9	C J	39		
PCB 174 (BZ)	4.8	J	19		
PCB 175 (BZ)	0.86	J Q	19		
PCB 176 (BZ)	0.96	J	19		
PCB 177 (BZ)	3.8	J Q	19		
PCB 178 (BZ)	5.2	J	19		
PCB 179 (BZ)	3.1	J	19		
PCB 180 (BZ)	40	C	39		
PCB 181 (BZ)	1.9 U		19		
PCB 182 (BZ)	0.96 U		19		
PCB 183 (BZ)	10	J	19		
PCB 184 (BZ)	0.66	J	19		
PCB 185 (BZ)	1.9 U		19		

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.96 U		19		
PCB 187 (BZ)	17	J	19		
PCB 188 (BZ)	1.4	J	19		
PCB 189 (BZ)	0.96 U		1.9	0.00003	0.000029
PCB 190 (BZ)	0.96 U		19		
PCB 191 (BZ)	0.92	J	19		
PCB 192 (BZ)	0.96 U		19		
PCB 193 (BZ)	40	C	39		
PCB 194 (BZ)	5.0	J	19		
PCB 195 (BZ)	0.96 U		19		
PCB 196 (BZ)	5.5	J	19		
PCB 197 (BZ)	1.5	J	19		
PCB 198 (BZ)	15	C J	39		
PCB 199 (BZ)/200 (IUPAC)	1.9 U		19		
PCB 200 (BZ)/201 (IUPAC)	3.4	J	19		
PCB 201 (BZ)/199 (IUPAC)	15	C J	39		
PCB 202 (BZ)	7.2	J	19		
PCB 203 (BZ)	2.0	J	19		
PCB 204 (BZ)	0.96 U		19		
PCB 205 (BZ)	0.96 U		19		
PCB 206 (BZ)	1.9	J Q	19		
PCB 207 (BZ)	0.96 U	J Q	19		
PCB 208 (BZ)	1.8	J Q	19		
PCB 209 (BZ)	2.3	J	19		
Monochlorobiphenyl (total)	5.3		19		
Dichlorobiphenyl (total)	13		19		
Trichlorobiphenyl (total)	25		19		
Tetrachlorobiphenyl (total)	150		19		
Pentachlorobiphenyl (total)	400		19		
Hexachlorobiphenyl (total)	260		19		
Heptachlorobiphenyl (total)	120		19		
Octachlorobiphenyl (total)	39		19		
Nonachlorobiphenyl (total)	4.5		19		
Total TEQ Concentration					0.13

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.96	Units.....:	pg/g
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	42		5.0 - 145
13C12-PCB 3	43		5.0 - 145
13C12-PCB 4	40		5.0 - 145
13C12-PCB 15	62		5.0 - 145
13C12-PCB 19	37		5.0 - 145
13C12-PCB 37	75		5.0 - 145
13C12-PCB 54	46		5.0 - 145
13C12-PCB 77	79		10 - 145
13C12-PCB 81	79		10 - 145
13C12-PCB 104	53		10 - 145
13C12-PCB 105	76		10 - 145
13C12-PCB 114	77		10 - 145
13C12-PCB 118	73		10 - 145
13C12-PCB 123	77		10 - 145
13C12-PCB 126	73		10 - 145
13C12-PCB 155	74		10 - 145
13C12-PCB 156	100	C	10 - 145
13C12-PCB 157	100	C	10 - 145
13C12-PCB 167	101		10 - 145
13C12-PCB 169	98		10 - 145
13C12-PCB 188	91		10 - 145
13C12-PCB 189	112		10 - 145
13C12-PCB 202	100		10 - 145
13C12-PCB 205	86		10 - 145
13C12-PCB 206	92		10 - 145
13C12-PCB 208	101		10 - 145
13C12-PCB 209	86		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	71	5.0 - 145
13C12-PCB 178	77	10 - 145
13C12-PCB 111	79	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 009	**Work Order #....:**	MQN8J1AF	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/21/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.96	**Units.....:**	pg/g
Initial Wgt/Vol :	10.37 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.0 U	J Q	20		
PCB 2 (BZ)	1.8	J	20		
PCB 3 (BZ)	1.3	J Q	20		
PCB 4 (BZ)	9.9 U		20		
PCB 5 (BZ)	9.9 U		20		
PCB 6 (BZ)	9.9 U		20		
PCB 7 (BZ)	9.9 U		20		
PCB 8 (BZ)	9.9 U		20		
PCB 9 (BZ)	9.9 U		20		
PCB 10 (BZ)	9.9 U		20		
PCB 11 (BZ)	11	J Q B	20		
PCB 12 (BZ)	20 U		40		
PCB 13 (BZ)	20 U		40		
PCB 14 (BZ)	9.9 U		20		
PCB 15 (BZ)	9.9 U		20		
PCB 16 (BZ)	0.71	J	20		
PCB 17 (BZ)	0.86	J	20		
PCB 18 (BZ)	1.9	C J B	40		
PCB 19 (BZ)	1.3	J	20		
PCB 20 (BZ)	8.9	C J B	40		
PCB 21 (BZ)	2.4	C J B	40		
PCB 22 (BZ)	1.6	J Q	20		
PCB 23 (BZ)	0.99 U		20		
PCB 24 (BZ)	0.99 U		20		
PCB 25 (BZ)	0.99 U		20		
PCB 26 (BZ)	1.3	C J	40		
PCB 27 (BZ)	0.99 U		20		
PCB 28 (BZ)	8.9	C J B	40		
PCB 29 (BZ)	1.3	C J	40		
PCB 30 (BZ)	1.9	C J B	40		
PCB 31 (BZ)	7.2	J B	20		
PCB 32 (BZ)	1.3	J Q B	20		
PCB 33 (BZ)	2.4	C J B	40		
PCB 34 (BZ)	0.99 U		20		
PCB 35 (BZ)	2.0 U		20		
PCB 36 (BZ)	0.74	J Q	20		
PCB 37 (BZ)	1.3	J B	20		

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.99 U		20		
PCB 39 (BZ)	0.99 U		20		
PCB 40 (BZ)	4.3	C J	40		
PCB 41 (BZ)	0.99 U		20		
PCB 42 (BZ)	2.2	J	20		
PCB 43 (BZ)	0.99 U		20		
PCB 44 (BZ)	33	C J B	60		
PCB 45 (BZ)	0.99 U		20		
PCB 46 (BZ)	0.99 U		20		
PCB 47 (BZ)	33	C J B	60		
PCB 48 (BZ)	1.5	J	20		
PCB 49 (BZ)	23	C J B	40		
PCB 50 (BZ)	2.1	C J	40		
PCB 51 (BZ)	1.5	J Q	20		
PCB 52 (BZ)	68	B	20		
PCB 53 (BZ)	2.1	C J	40		
PCB 54 (BZ)	0.66	J	20		
PCB 55 (BZ)	2.0 U		20		
PCB 56 (BZ)	5.7	J	20		
PCB 57 (BZ)	0.99 U		20		
PCB 58 (BZ)	0.99 U		20		
PCB 59 (BZ)	1.9	C J	60		
PCB 60 (BZ)	4.9	J	20		
PCB 61 (BZ)	65	C J B	80		
PCB 62 (BZ)	1.9	C J	60		
PCB 63 (BZ)	1.2	J	20		
PCB 64 (BZ)	9.3	J	20		
PCB 65 (BZ)	33	C J B	60		
PCB 66 (BZ)	28		20		
PCB 67 (BZ)	0.99 U	J Q	20		
PCB 68 (BZ)	1.7	J	20		
PCB 69 (BZ)	23	C J B	40		
PCB 70 (BZ)	65	C J B	80		
PCB 71 (BZ)	4.3	C J	40		
PCB 72 (BZ)	0.69	J Q	20		
PCB 73 (BZ)	0.99 U		20		
PCB 74 (BZ)	65	C J B	80		

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units....:	pg/g
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	1.9	C J	60		
PCB 76 (BZ)	65	C J B	80		
PCB 77 (BZ)	1.7	J Q	2.0	0.0001	0.00017
PCB 78 (BZ)	0.99 U		20		
PCB 79 (BZ)	0.98	J Q	20		
PCB 80 (BZ)	0.99 U		20		
PCB 81 (BZ)	0.99 U		2.0	0.0003	0.00030
PCB 82 (BZ)	1.6	J	20		
PCB 83 (BZ)	6.3	J	20		
PCB 84 (BZ)	15	J	20		
PCB 85 (BZ)	12	C J Q	60		
PCB 86 (BZ)	50	C J	120		
PCB 87 (BZ)	50	C J	120		
PCB 88 (BZ)	13	C J	40		
PCB 89 (BZ)	0.99 U		20		
PCB 90 (BZ)	130	C B	60		
PCB 91 (BZ)	13	C J	40		
PCB 92 (BZ)	25		20		
PCB 93 (BZ)	2.0 U	C J	40		
PCB 94 (BZ)	0.99 U		20		
PCB 95 (BZ)	70	B	20		
PCB 96 (BZ)	0.99 U		20		
PCB 97 (BZ)	50	C J	120		
PCB 98 (BZ)	1.8	C J	40		
PCB 99 (BZ)	54		20		
PCB 100 (BZ)	2.0 U	C J	40		
PCB 101 (BZ)	130	C B	60		
PCB 102 (BZ)	1.8	C J	40		
PCB 103 (BZ)	1.1	J	20		
PCB 104 (BZ)	0.99 U		20		
PCB 105 (BZ)	17	B	2.0	0.00003	0.00051
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	4.8	J	20		
PCB 108 (BZ)/107 (IUPAC)	2.4	C J Q	40		
PCB 109 (BZ)/108 (IUPAC)	50	C J	120		
PCB 110 (BZ)	95	C B	40		
PCB 111 (BZ)	0.99 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.99 U		20		
PCB 113 (BZ)	130	C B	60		
PCB 114 (BZ)	0.93	J Q	2.0	0.00003	0.000028
PCB 115 (BZ)	95	C B	40		
PCB 116 (BZ)	12	C J Q	60		
PCB 117 (BZ)	12	C J Q	60		
PCB 118 (BZ)	61	B	2.0	0.00003	0.0018
PCB 119 (BZ)	50	C J	120		
PCB 120 (BZ)	0.99 U		20		
PCB 121 (BZ)	0.99 U		20		
PCB 122 (BZ)	0.99 U		20		
PCB 123 (BZ)	1.1	J	2.0	0.00003	0.000033
PCB 124 (BZ)	2.4	C J Q	40		
PCB 125 (BZ)	50	C J	120		
PCB 126 (BZ)	0.99 U		2.0	0.1	0.099
PCB 127 (BZ)	0.99 U		20		
PCB 128 (BZ)	7.3	C J	40		
PCB 129 (BZ)	56	C J	60		
PCB 130 (BZ)	4.1	J Q	20		
PCB 131 (BZ)	0.99 U		20		
PCB 132 (BZ)	11	J	20		
PCB 133 (BZ)	1.8	J	20		
PCB 134 (BZ)	1.3	C J Q	40		
PCB 135 (BZ)	18	C J	40		
PCB 136 (BZ)	8.1	J	20		
PCB 137 (BZ)	1.4	J Q	20		
PCB 138 (BZ)	56	C J	60		
PCB 139 (BZ)	1.0	C J Q	40		
PCB 140 (BZ)	1.0	C J Q	40		
PCB 141 (BZ)	9.2	J	20		
PCB 142 (BZ)	0.99 U		20		
PCB 143 (BZ)	1.3	C J Q	40		
PCB 144 (BZ)	2.4	J	20		
PCB 145 (BZ)	0.99 U		20		
PCB 146 (BZ)	11	J	20		
PCB 147 (BZ)	40	C	40		
PCB 148 (BZ)	0.99 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	40	C	40		
PCB 150 (BZ)	0.99 U		20		
PCB 151 (BZ)	18	C J	40		
PCB 152 (BZ)	0.99 U		20		
PCB 153 (BZ)	63	C	40		
PCB 154 (BZ)	1.5	J Q	20		
PCB 155 (BZ)	0.99 U		20		
PCB 156 (BZ)	5.3	C	4.0	0.00003	0.00016
PCB 157 (BZ)	5.3	C	4.0	0.00003	0.00016
PCB 158 (BZ)	4.9	J	20		
PCB 159 (BZ)	0.99 U		20		
PCB 160 (BZ)	0.99 U		20		
PCB 161 (BZ)	0.99 U		20		
PCB 162 (BZ)	0.97	J Q	20		
PCB 163 (BZ)	56	C J	60		
PCB 164 (BZ)	2.5	J Q	20		
PCB 165 (BZ)	0.99 U		20		
PCB 166 (BZ)	7.3	C J	40		
PCB 167 (BZ)	2.7	Q	2.0	0.00003	0.000081
PCB 168 (BZ)	63	C	40		
PCB 169 (BZ)	0.99 U		2.0	0.03	0.030
PCB 170 (BZ)	12	J	20		
PCB 171 (BZ)	3.6	C J	40		
PCB 172 (BZ)	3.6	J	20		
PCB 173 (BZ)	3.6	C J	40		
PCB 174 (BZ)	7.3	J	20		
PCB 175 (BZ)	0.99 U		20		
PCB 176 (BZ)	0.91	J	20		
PCB 177 (BZ)	6.2	J	20		
PCB 178 (BZ)	4.5	J	20		
PCB 179 (BZ)	3.2	J	20		
PCB 180 (BZ)	30	C J	40		
PCB 181 (BZ)	2.0 U		20		
PCB 182 (BZ)	0.99 U		20		
PCB 183 (BZ)	7.6	J	20		
PCB 184 (BZ)	0.62	J	20		
PCB 185 (BZ)	2.0 U		20		

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.99 U		20		
PCB 187 (BZ)	20	J	20		
PCB 188 (BZ)	1.3	J Q	20		
PCB 189 (BZ)	0.99 U		2.0	0.00003	0.000030
PCB 190 (BZ)	0.99 U		20		
PCB 191 (BZ)	0.99 U		20		
PCB 192 (BZ)	0.99 U		20		
PCB 193 (BZ)	30	C J	40		
PCB 194 (BZ)	2.6	J Q	20		
PCB 195 (BZ)	0.99 U		20		
PCB 196 (BZ)	4.3	J	20		
PCB 197 (BZ)	1.4	J	20		
PCB 198 (BZ)	16	C J	40		
PCB 199 (BZ)/200 (IUPAC)	2.0 U		20		
PCB 200 (BZ)/201 (IUPAC)	3.4	J	20		
PCB 201 (BZ)/199 (IUPAC)	16	C J	40		
PCB 202 (BZ)	6.2	J	20		
PCB 203 (BZ)	1.5	J Q	20		
PCB 204 (BZ)	0.99 U		20		
PCB 205 (BZ)	0.99 U		20		
PCB 206 (BZ)	3.1	J Q	20		
PCB 207 (BZ)	0.99 U		20		
PCB 208 (BZ)	1.8	J Q	20		
PCB 209 (BZ)	2.0 U	J	20		
Monochlorobiphenyl (total)	4.0		20		
Dichlorobiphenyl (total)	11		20		
Trichlorobiphenyl (total)	30		20		
Tetrachlorobiphenyl (total)	260		20		
Pentachlorobiphenyl (total)	570		20		
Hexachlorobiphenyl (total)	250		20		
Heptachlorobiphenyl (total)	99		20		
Octachlorobiphenyl (total)	35		20		
Nonachlorobiphenyl (total)	4.9		20		
Total TEQ Concentration					0.13

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	Work Order #....:	MQN8K1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/14/12	Analysis Date....:	02/21/12		
Prep Batch # ....:	2045127	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.06 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	48		5.0 - 145
13C12-PCB 3	47		5.0 - 145
13C12-PCB 4	43		5.0 - 145
13C12-PCB 15	66		5.0 - 145
13C12-PCB 19	49		5.0 - 145
13C12-PCB 37	82		5.0 - 145
13C12-PCB 54	47		5.0 - 145
13C12-PCB 77	88		10 - 145
13C12-PCB 81	86		10 - 145
13C12-PCB 104	59		10 - 145
13C12-PCB 105	82		10 - 145
13C12-PCB 114	84		10 - 145
13C12-PCB 118	81		10 - 145
13C12-PCB 123	83		10 - 145
13C12-PCB 126	84		10 - 145
13C12-PCB 155	80		10 - 145
13C12-PCB 156	105	C	10 - 145
13C12-PCB 157	105	C	10 - 145
13C12-PCB 167	106		10 - 145
13C12-PCB 169	94		10 - 145
13C12-PCB 188	124		10 - 145
13C12-PCB 189	127		10 - 145
13C12-PCB 202	132		10 - 145
13C12-PCB 205	90		10 - 145
13C12-PCB 206	99		10 - 145
13C12-PCB 208	121		10 - 145
13C12-PCB 209	92		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	75	5.0 - 145
13C12-PCB 178	85	10 - 145
13C12-PCB 111	87	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 010	**Work Order #....:**	MQN8K1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/14/12	**Analysis Date....:**	02/21/12		
Prep Batch # ....:	2045127	**Dilution Factor....:**	0.99	**Units.....:**	pg/g
Initial Wgt/Vol :	10.06 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.7	J Q	20		
PCB 2 (BZ)	3.5	J	20		
PCB 3 (BZ)	1.1	J Q	20		
PCB 4 (BZ)	9.9	J Q	20		
PCB 5 (BZ)	9.8 U		20		
PCB 6 (BZ)	9.8 U		20		
PCB 7 (BZ)	9.8 U		20		
PCB 8 (BZ)	37		20		
PCB 9 (BZ)	9.8 U		20		
PCB 10 (BZ)	9.8 U		20		
PCB 11 (BZ)	71		20		
PCB 12 (BZ)	20 U		39		
PCB 13 (BZ)	20 U		39		
PCB 14 (BZ)	9.8 U		20		
PCB 15 (BZ)	10	J Q	20		
PCB 16 (BZ)	10	J	20		
PCB 17 (BZ)	28	B	20		
PCB 18 (BZ)	62	C B	39		
PCB 19 (BZ)	11	J	20		
PCB 20 (BZ)	320	C B	39		
PCB 21 (BZ)	93	C B	39		
PCB 22 (BZ)	58	B	20		
PCB 23 (BZ)	3.3	J Q	20		
PCB 24 (BZ)	0.98 U		20		
PCB 25 (BZ)	23		20		
PCB 26 (BZ)	48	C	39		
PCB 27 (BZ)	6.7	J	20		
PCB 28 (BZ)	320	C B	39		
PCB 29 (BZ)	48	C	39		
PCB 30 (BZ)	62	C B	39		
PCB 31 (BZ)	220	B	20		
PCB 32 (BZ)	71		20		
PCB 33 (BZ)	93	C B	39		
PCB 34 (BZ)	0.98 U		20		
PCB 35 (BZ)	2.0 U	J Q	20		
PCB 36 (BZ)	20		20		
PCB 37 (BZ)	33		20		

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012 426

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.98 U		20		
PCB 39 (BZ)	0.98 U		20		
PCB 40 (BZ)	200	C	39		
PCB 41 (BZ)	0.98 U		20		
PCB 42 (BZ)	78		20		
PCB 43 (BZ)	10	J	20		
PCB 44 (BZ)	940	C B	59		
PCB 45 (BZ)	26		20		
PCB 46 (BZ)	10	J	20		
PCB 47 (BZ)	940	C B	59		
PCB 48 (BZ)	43		20		
PCB 49 (BZ)	870	C	39		
PCB 50 (BZ)	110	C B	39		
PCB 51 (BZ)	40		20		
PCB 53 (BZ)	110	C B	39		
PCB 54 (BZ)	2.0	J	20		
PCB 55 (BZ)	2.0 U		20		
PCB 56 (BZ)	280		20		
PCB 57 (BZ)	78		20		
PCB 58 (BZ)	0.98 U		20		
PCB 59 (BZ)	63	C	59		
PCB 60 (BZ)	160		20		
PCB 61 (BZ)	2600	C B	79		
PCB 62 (BZ)	63	C	59		
PCB 63 (BZ)	53		20		
PCB 64 (BZ)	350	B	20		
PCB 65 (BZ)	940	C B	59		
PCB 66 (BZ)	1200	B	20		
PCB 67 (BZ)	29		20		
PCB 68 (BZ)	18	J	20		
PCB 69 (BZ)	870	C	39		
PCB 70 (BZ)	2600	C B	79		
PCB 71 (BZ)	200	C	39		
PCB 72 (BZ)	29		20		
PCB 73 (BZ)	0.98 U		20		
PCB 74 (BZ)	2600	C B	79		
PCB 75 (BZ)	63	C	59		

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 76 (BZ)	2600	C B	79		
PCB 77 (BZ)	52		2.0	0.0001	0.0052
PCB 78 (BZ)	0.98 U		20		
PCB 79 (BZ)	71		20		
PCB 80 (BZ)	0.98 U		20		
PCB 81 (BZ)	0.98 U		2.0	0.0003	0.00029
PCB 82 (BZ)	160		20		
PCB 83 (BZ)	0.98 U		20		
PCB 84 (BZ)	530		20		
PCB 85 (BZ)	800	C	59		
PCB 86 (BZ)	2500	C	120		
PCB 87 (BZ)	2500	C	120		
PCB 88 (BZ)	470	C	39		
PCB 89 (BZ)	14	J	20		
PCB 91 (BZ)	470	C	39		
PCB 92 (BZ)	980		20		
PCB 93 (BZ)	29	C J	39		
PCB 94 (BZ)	8.8	J	20		
PCB 96 (BZ)	5.8	J	20		
PCB 97 (BZ)	2500	C	120		
PCB 98 (BZ)	77	C	39		
PCB 100 (BZ)	29	C J	40		
PCB 102 (BZ)	77	C	39		
PCB 103 (BZ)	31		20		
PCB 104 (BZ)	0.98 U		20		
PCB 105 (BZ)	1600	B	2.0	0.00003	0.048
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	380		20		
PCB 108 (BZ)/107 (IUPAC)	200	C	39		
PCB 109 (BZ)/108 (IUPAC)	2500	C	120		
PCB 111 (BZ)	0.98 U		20		
PCB 112 (BZ)	0.98 U		20		
PCB 114 (BZ)	120		2.0	0.00003	0.0036
PCB 116 (BZ)	800	C	59		
PCB 117 (BZ)	800	C	59		
PCB 119 (BZ)	2500	C	120		
PCB 120 (BZ)	22		20		

428

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 121 (BZ)	1.4	J Q	20		
PCB 122 (BZ)	61		20		
PCB 123 (BZ)	64		2.0	0.00003	0.0019
PCB 124 (BZ)	200	C	39		
PCB 125 (BZ)	2500	C	120		
PCB 126 (BZ)	13		2.0	0.1	1.3
PCB 127 (BZ)	7.6	J Q	20		
PCB 128 (BZ)	750	C	39		
PCB 129 (BZ)	5200	C B	59		
PCB 130 (BZ)	320		20		
PCB 131 (BZ)	19	J Q	20		
PCB 132 (BZ)	920		20		
PCB 133 (BZ)	74		20		
PCB 134 (BZ)	130	C	39		
PCB 135 (BZ)	830	C	39		
PCB 136 (BZ)	290		20		
PCB 137 (BZ)	220		20		
PCB 138 (BZ)	5200	C B	59		
PCB 139 (BZ)	95	C	39		
PCB 140 (BZ)	95	C	39		
PCB 141 (BZ)	670		20		
PCB 142 (BZ)	0.98 U		20		
PCB 143 (BZ)	130	C	39		
PCB 144 (BZ)	120		20		
PCB 145 (BZ)	1.1	J Q	20		
PCB 146 (BZ)	650		20		
PCB 147 (BZ)	2700	C B	39		
PCB 148 (BZ)	3.6	J	20		
PCB 149 (BZ)	2700	C B	39		
PCB 150 (BZ)	3.7	J	20		
PCB 151 (BZ)	830	C	39		
PCB 152 (BZ)	1.9	J	20		
PCB 154 (BZ)	56		20		
PCB 155 (BZ)	0.98 U		20		
PCB 156 (BZ)	830	C	3.9	0.00003	0.025
PCB 157 (BZ)	830	C	3.9	0.00003	0.025
PCB 158 (BZ)	590		20		

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 159 (BZ)	6.3	J	20		
PCB 160 (BZ)	0.98 U		20		
PCB 161 (BZ)	0.98 U		20		
PCB 162 (BZ)	35		20		
PCB 163 (BZ)	5200	C B	59		
PCB 164 (BZ)	310		20		
PCB 165 (BZ)	1.2	J Q	20		
PCB 166 (BZ)	750	C	39		
PCB 167 (BZ)	280		2.0	0.00003	0.0084
PCB 169 (BZ)	0.98 U		2.0	0.03	0.029
PCB 170 (BZ)	510		20		
PCB 171 (BZ)	180	C	39		
PCB 172 (BZ)	100		20		
PCB 173 (BZ)	180	C	39		
PCB 174 (BZ)	360		20		
PCB 175 (BZ)	15	J	20		
PCB 176 (BZ)	25		20		
PCB 177 (BZ)	300		20		
PCB 178 (BZ)	82		20		
PCB 179 (BZ)	100		20		
PCB 180 (BZ)	960	C	39		
PCB 181 (BZ)	13	J	20		
PCB 182 (BZ)	5.2	J	20		
PCB 183 (BZ)	230		20		
PCB 184 (BZ)	1.2	J	20		
PCB 185 (BZ)	31		20		
PCB 186 (BZ)	0.98 U		20		
PCB 187 (BZ)	540		20		
PCB 188 (BZ)	3.1	J	20		
PCB 189 (BZ)	19		2.0	0.00003	0.00057
PCB 190 (BZ)	79		20		
PCB 191 (BZ)	24		20		
PCB 192 (BZ)	0.98 U		20		
PCB 193 (BZ)	960	C	39		
PCB 194 (BZ)	79		20		
PCB 195 (BZ)	31		20		
PCB 196 (BZ)	48		20		

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 197 (BZ)	5.6	J	20		
PCB 198 (BZ)	160	C	39		
PCB 199 (BZ)/200 (IUPAC)	7.2	J	20		
PCB 200 (BZ)/201 (IUPAC)	17	J	20		
PCB 201 (BZ)/199 (IUPAC)	160	C	39		
PCB 202 (BZ)	36		20		
PCB 203 (BZ)	75		20		
PCB 204 (BZ)	0.98 U		20		
PCB 205 (BZ)	2.8	J Q	20		
PCB 206 (BZ)	33		20		
PCB 207 (BZ)	5.8	J	20		
PCB 208 (BZ)	18	J	20		
PCB 209 (BZ)	13	J	20		
Monochlorobiphenyl (total)	7.4		20		
Dichlorobiphenyl (total)	130		20		
Trichlorobiphenyl (total)	1000		20		
Tetrachlorobiphenyl (total)	9800		20		
Pentachlorobiphenyl (total)	31000		20		
Hexachlorobiphenyl (total)	19000		20		
Heptachlorobiphenyl (total)	3600		20		
Octachlorobiphenyl (total)	460		20		
Nonachlorobiphenyl (total)	57		20		
Total TEQ Concentration					1.4

431

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	48		5.0 - 145
13C12-PCB 3	53		5.0 - 145
13C12-PCB 4	42		5.0 - 145
13C12-PCB 15	60		5.0 - 145
13C12-PCB 19	48		5.0 - 145
13C12-PCB 37	71		5.0 - 145
13C12-PCB 54	43		5.0 - 145
13C12-PCB 77	78		10 - 145
13C12-PCB 81	77		10 - 145
13C12-PCB 104	53		10 - 145
13C12-PCB 105	80		10 - 145
13C12-PCB 114	76		10 - 145
13C12-PCB 118	78		10 - 145
13C12-PCB 123	77		10 - 145
13C12-PCB 126	82		10 - 145
13C12-PCB 155	67		10 - 145
13C12-PCB 156	104	C	10 - 145
13C12-PCB 157	104	C	10 - 145
13C12-PCB 167	100		10 - 145
13C12-PCB 169	101		10 - 145
13C12-PCB 188	73		10 - 145
13C12-PCB 189	96		10 - 145
13C12-PCB 202	79		10 - 145
13C12-PCB 205	85		10 - 145
13C12-PCB 206	81		10 - 145
13C12-PCB 208	83		10 - 145
13C12-PCB 209	76		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	69	5.0 - 145
13C12-PCB 178	74	10 - 145
13C12-PCB 111	74	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	**Work Order #....:**	MQN8L1AD	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	01/31/12	**Date Received.....:**	02/08/12	**Instrument ID.....:**	12D8
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/23/12		
Prep Batch # .....:	2047107	**Dilution Factor.....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.16 g	**Analyst ID.....:**	Sylvia H. Krenn		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	Work Order #....:	MQN8L2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	4.92	Units.....:	pg/g
Initial Wgt/Vol :	10.16 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 52 (BZ)	2400	B	98		
PCB 90 (BZ)	5900	C B	300		
PCB 95 (BZ)	2500	B	98		
PCB 99 (BZ)	3100		98		
PCB 101 (BZ)	5900	C B	300		
PCB 110 (BZ)	6100	C B	200		
PCB 113 (BZ)	5900	C B	400		
PCB 115 (BZ)	6100	C B	200		
PCB 118 (BZ)	5600	B	9.8	0.00003	0.17
PCB 153 (BZ)	4100	C	200		
PCB 168 (BZ)	4100	C	200		
Total TEQ Concentration					0.17

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 54	46		5.0 - 145
13C12-PCB 77	82		10 - 145
13C12-PCB 81	79		10 - 145
13C12-PCB 104	54		10 - 145
13C12-PCB 105	76		10 - 145
13C12-PCB 114	77		10 - 145
13C12-PCB 118	81		10 - 145
13C12-PCB 123	79		10 - 145
13C12-PCB 126	82		10 - 145
13C12-PCB 155	63		10 - 145
13C12-PCB 156	103	C	10 - 145
13C12-PCB 157	103	C	10 - 145
13C12-PCB 167	102		10 - 145
13C12-PCB 169	103		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	75	5.0 - 145
13C12-PCB 178	75	10 - 145
13C12-PCB 111	71	10 - 145

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 011	**Work Order #....:**	MQN8L2AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	4.92	**Units.....:**	pg/g
Initial Wgt/Vol :	10.16 g	**Analyst ID....:**	Sylvia H. Krenn		

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	3.1	J	20		
PCB 2 (BZ)	4.1	J	20		
PCB 3 (BZ)	1.2	J Q	20		
PCB 4 (BZ)	8.7	J Q	20		
PCB 5 (BZ)	9.9 U		20		
PCB 6 (BZ)	11	J	20		
PCB 7 (BZ)	9.9 U		20		
PCB 8 (BZ)	39		20		
PCB 9 (BZ)	9.9 U		20		
PCB 10 (BZ)	9.9 U		20		
PCB 11 (BZ)	72		20		
PCB 12 (BZ)	20 U	C J Q	40		
PCB 13 (BZ)	20 U	C J Q	40		
PCB 14 (BZ)	9.9 U		20		
PCB 15 (BZ)	9.1	J Q	20		
PCB 16 (BZ)	11	J	20		
PCB 17 (BZ)	32	B	20		
PCB 18 (BZ)	64	C B	40		
PCB 19 (BZ)	11	J	20		
PCB 20 (BZ)	350	C B	40		
PCB 21 (BZ)	100	C B	40		
PCB 22 (BZ)	63	B	20		
PCB 23 (BZ)	0.99 U		20		
PCB 24 (BZ)	0.99 U		20		
PCB 25 (BZ)	26		20		
PCB 26 (BZ)	54	C	40		
PCB 27 (BZ)	7.5	J	20		
PCB 28 (BZ)	350	C B	40		
PCB 29 (BZ)	54	C	40		
PCB 30 (BZ)	64	C B	40		
PCB 31 (BZ)	250	B	20		
PCB 32 (BZ)	76		20		
PCB 33 (BZ)	100	C B	40		
PCB 34 (BZ)	3.6	J	20		
PCB 35 (BZ)	2.0 U	J Q	20		
PCB 36 (BZ)	26		20		
PCB 37 (BZ)	36		20		

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.99 U		20		
PCB 39 (BZ)	1.6	J	20		
PCB 40 (BZ)	210	C	40		
PCB 41 (BZ)	0.99 U		20		
PCB 42 (BZ)	79		20		
PCB 43 (BZ)	13	J	20		
PCB 44 (BZ)	980	C B	60		
PCB 45 (BZ)	22		20		
PCB 46 (BZ)	10	J	20		
PCB 47 (BZ)	980	C B	60		
PCB 48 (BZ)	44		20		
PCB 49 (BZ)	910	C	40		
PCB 50 (BZ)	110	C B	40		
PCB 51 (BZ)	41		20		
PCB 53 (BZ)	110	C B	40		
PCB 54 (BZ)	2.2	J	20		
PCB 55 (BZ)	2.0 U		20		
PCB 56 (BZ)	300		20		
PCB 57 (BZ)	0.99 U		20		
PCB 58 (BZ)	0.99 U		20		
PCB 59 (BZ)	64	C	60		
PCB 60 (BZ)	170		20		
PCB 61 (BZ)	2800	C B	80		
PCB 62 (BZ)	64	C	60		
PCB 63 (BZ)	56		20		
PCB 64 (BZ)	360	B	20		
PCB 65 (BZ)	980	C B	60		
PCB 66 (BZ)	1300	B	20		
PCB 67 (BZ)	32		20		
PCB 68 (BZ)	19	J	20		
PCB 69 (BZ)	910	C	40		
PCB 70 (BZ)	2800	C B	80		
PCB 71 (BZ)	210	C	40		
PCB 72 (BZ)	24		20		
PCB 73 (BZ)	0.99 U		20		
PCB 74 (BZ)	2800	C B	80		
PCB 75 (BZ)	64	C	60		

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 76 (BZ)	2800	C B	80		
PCB 77 (BZ)	53		2.0	0.0001	0.0053
PCB 78 (BZ)	0.99 U		20		
PCB 79 (BZ)	71		20		
PCB 80 (BZ)	0.99 U		20		
PCB 81 (BZ)	0.99 U		2.0	0.0003	0.00030
PCB 82 (BZ)	170		20		
PCB 83 (BZ)	0.99 U		20		
PCB 84 (BZ)	560		20		
PCB 85 (BZ)	860	C	60		
PCB 86 (BZ)	2700	C	120		
PCB 87 (BZ)	2700	C	120		
PCB 88 (BZ)	510	C	40		
PCB 89 (BZ)	15	J	20		
PCB 91 (BZ)	510	C	40		
PCB 92 (BZ)	1000		20		
PCB 93 (BZ)	30	C J	40		
PCB 94 (BZ)	9.1	J	20		
PCB 96 (BZ)	5.7	J	20		
PCB 97 (BZ)	2700	C	120		
PCB 98 (BZ)	82	C	40		
PCB 100 (BZ)	30	C J	40		
PCB 102 (BZ)	82	C	40		
PCB 103 (BZ)	33		20		
PCB 104 (BZ)	0.57	J Q	20		
PCB 105 (BZ)	1800	B	2.0	0.00003	0.054
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	400		20		
PCB 108 (BZ)/107 (IUPAC)	220	C	40		
PCB 109 (BZ)/108 (IUPAC)	2700	C	120		
PCB 111 (BZ)	5.4	J	20		
PCB 112 (BZ)	0.99 U		20		
PCB 114 (BZ)	120		2.0	0.00003	0.0036
PCB 116 (BZ)	860	C	60		
PCB 117 (BZ)	860	C	60		
PCB 119 (BZ)	2700	C	120		
PCB 120 (BZ)	24		20		

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 121 (BZ)	1.4	J	20		
PCB 122 (BZ)	58		20		
PCB 123 (BZ)	71		2.0	0.00003	0.0021
PCB 124 (BZ)	220	C	40		
PCB 125 (BZ)	2700	C	120		
PCB 126 (BZ)	8.5		2.0	0.1	0.85
PCB 127 (BZ)	8.0	J	20		
PCB 128 (BZ)	840	C	40		
PCB 129 (BZ)	5600	C B	60		
PCB 130 (BZ)	360		20		
PCB 131 (BZ)	20	J	20		
PCB 132 (BZ)	1000		20		
PCB 133 (BZ)	83		20		
PCB 134 (BZ)	120	C	40		
PCB 135 (BZ)	900	C	40		
PCB 136 (BZ)	310		20		
PCB 137 (BZ)	240		20		
PCB 138 (BZ)	5600	C B	60		
PCB 139 (BZ)	100	C	40		
PCB 140 (BZ)	100	C	40		
PCB 141 (BZ)	690		20		
PCB 142 (BZ)	0.99 U		20		
PCB 143 (BZ)	120	C	40		
PCB 144 (BZ)	130		20		
PCB 145 (BZ)	0.99 U		20		
PCB 146 (BZ)	710		20		
PCB 147 (BZ)	2900	C B	40		
PCB 148 (BZ)	3.6	J	20		
PCB 149 (BZ)	2900	C B	40		
PCB 150 (BZ)	4.0	J	20		
PCB 151 (BZ)	900	C	40		
PCB 152 (BZ)	2.1	J Q	20		
PCB 154 (BZ)	58		20		
PCB 155 (BZ)	1.0	J Q	20		
PCB 156 (BZ)	920	C	4.0	0.00003	0.028
PCB 157 (BZ)	920	C	4.0	0.00003	0.028
PCB 158 (BZ)	680		20		

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 159 (BZ)	8.5	J	20		
PCB 160 (BZ)	0.99 U		20		
PCB 161 (BZ)	0.99 U		20		
PCB 162 (BZ)	40		20		
PCB 163 (BZ)	5600	C B	60		
PCB 164 (BZ)	340		20		
PCB 165 (BZ)	0.74	J	20		
PCB 166 (BZ)	840	C	40		
PCB 167 (BZ)	300		2.0	0.00003	0.0090
PCB 169 (BZ)	1.3	J	2.0	0.03	0.039
PCB 170 (BZ)	590		20		
PCB 171 (BZ)	210	C	40		
PCB 172 (BZ)	120		20		
PCB 173 (BZ)	210	C	40		
PCB 174 (BZ)	410		20		
PCB 175 (BZ)	17	J	20		
PCB 176 (BZ)	28		20		
PCB 177 (BZ)	340		20		
PCB 178 (BZ)	94		20		
PCB 179 (BZ)	110		20		
PCB 180 (BZ)	1100	C	40		
PCB 181 (BZ)	15	J	20		
PCB 182 (BZ)	5.1	J	20		
PCB 183 (BZ)	260		20		
PCB 184 (BZ)	0.94	J Q	20		
PCB 185 (BZ)	48		20		
PCB 186 (BZ)	0.99 U		20		
PCB 187 (BZ)	620		20		
PCB 188 (BZ)	3.0	J	20		
PCB 189 (BZ)	20		2.0	0.00003	0.00060
PCB 190 (BZ)	82		20		
PCB 191 (BZ)	25		20		
PCB 192 (BZ)	0.99 U		20		
PCB 193 (BZ)	1100	C	40		
PCB 194 (BZ)	86		20		
PCB 195 (BZ)	34		20		
PCB 196 (BZ)	56		20		

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 197 (BZ)	4.8	J Q	20		
PCB 198 (BZ)	180	C	40		
PCB 199 (BZ)/200 (IUPAC)	7.2	J Q	20		
PCB 200 (BZ)/201 (IUPAC)	20	J	20		
PCB 201 (BZ)/199 (IUPAC)	180	C	40		
PCB 202 (BZ)	38		20		
PCB 203 (BZ)	83		20		
PCB 204 (BZ)	0.99 U		20		
PCB 205 (BZ)	3.7	J	20		
PCB 206 (BZ)	39		20		
PCB 207 (BZ)	7.0	J	20		
PCB 208 (BZ)	19	J	20		
PCB 209 (BZ)	15	J	20		
Monochlorobiphenyl (total)	8.5		20		
Dichlorobiphenyl (total)	150		20		
Trichlorobiphenyl (total)	1100		20		
Tetrachlorobiphenyl (total)	10000		20		
Pentachlorobiphenyl (total)	34000		20		
Hexachlorobiphenyl (total)	21000		20		
Heptachlorobiphenyl (total)	4100		20		
Octachlorobiphenyl (total)	510		20		
Nonachlorobiphenyl (total)	65		20		
Total TEQ Concentration					1.0

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	45		5.0 - 145
13C12-PCB 3	46		5.0 - 145
13C12-PCB 4	40		5.0 - 145
13C12-PCB 15	65		5.0 - 145
13C12-PCB 19	44		5.0 - 145
13C12-PCB 37	79		5.0 - 145
13C12-PCB 54	45		5.0 - 145
13C12-PCB 77	91		10 - 145
13C12-PCB 81	90		10 - 145
13C12-PCB 104	56		10 - 145
13C12-PCB 105	87		10 - 145
13C12-PCB 114	86		10 - 145
13C12-PCB 118	86		10 - 145
13C12-PCB 123	87		10 - 145
13C12-PCB 126	93		10 - 145
13C12-PCB 155	72		10 - 145
13C12-PCB 156	115	C	10 - 145
13C12-PCB 157	115	C	10 - 145
13C12-PCB 167	113		10 - 145
13C12-PCB 169	108		10 - 145
13C12-PCB 188	90		10 - 145
13C12-PCB 189	113		10 - 145
13C12-PCB 202	101		10 - 145
13C12-PCB 205	91		10 - 145
13C12-PCB 206	90		10 - 145
13C12-PCB 208	99		10 - 145
13C12-PCB 209	83		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	72	5.0 - 145
13C12-PCB 178	81	10 - 145
13C12-PCB 111	83	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	**Work Order #....:**	MQN8P1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.99	**Units.....:**	pg/g
Initial Wgt/Vol :	10.05 g	**Analyst ID....:**	Sylvia H. Krenn		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	Work Order #....:	MQN8P2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	4.97	Units.....:	pg/g
Initial Wgt/Vol :	10.05 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 52 (BZ)	2700	B	100		
PCB 90 (BZ)	6600	C B	300		
PCB 95 (BZ)	2900	B	100		
PCB 99 (BZ)	3500		100		
PCB 101 (BZ)	6600	C B	300		
PCB 110 (BZ)	6700	C B	200		
PCB 113 (BZ)	6600	C B	300		
PCB 115 (BZ)	6700	C B	200		
PCB 118 (BZ)	6400	B	10	0.00003	0.19
PCB 153 (BZ)	4600	C	200		
PCB 168 (BZ)	4600	C	200		
Total TEQ Concentration					0.19

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 54	48		5.0 - 145
13C12-PCB 77	84		10 - 145
13C12-PCB 81	85		10 - 145
13C12-PCB 104	58		10 - 145
13C12-PCB 105	82		10 - 145
13C12-PCB 114	81		10 - 145
13C12-PCB 118	80		10 - 145
13C12-PCB 123	81		10 - 145
13C12-PCB 126	83		10 - 145
13C12-PCB 155	72		10 - 145
13C12-PCB 156	110	C	10 - 145
13C12-PCB 157	110	C	10 - 145
13C12-PCB 167	107		10 - 145
13C12-PCB 169	105		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	78	5.0 - 145
13C12-PCB 178	81	10 - 145
13C12-PCB 111	78	10 - 145

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 012	**Work Order #....:**	MQN8P2AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	4.97	**Units.....:**	pg/g
Initial Wgt/Vol :	10.05 g	**Analyst ID....:**	Sylvia H. Krenn		

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	1.9	J Q	19		
PCB 2 (BZ)	2.1	J Q	19		
PCB 3 (BZ)	1.5	J Q	19		
PCB 4 (BZ)	4.3	J Q	19		
PCB 5 (BZ)	9.5 U		19		
PCB 6 (BZ)	11	J	19		
PCB 7 (BZ)	9.5 U		19		
PCB 8 (BZ)	37		19		
PCB 9 (BZ)	9.5 U		19		
PCB 10 (BZ)	9.5 U		19		
PCB 11 (BZ)	70		19		
PCB 12 (BZ)	19 U	C J Q	38		
PCB 13 (BZ)	19 U	C J Q	38		
PCB 14 (BZ)	9.5 U		19		
PCB 15 (BZ)	18	J	19		
PCB 16 (BZ)	4.2	J	19		
PCB 17 (BZ)	14	J B	19		
PCB 18 (BZ)	23	C J B	38		
PCB 19 (BZ)	2.3	J	19		
PCB 20 (BZ)	500	C B	38		
PCB 21 (BZ)	57	C B	38		
PCB 22 (BZ)	130	B	19		
PCB 23 (BZ)	0.95 U		19		
PCB 24 (BZ)	0.95 U		19		
PCB 25 (BZ)	18	J	19		
PCB 26 (BZ)	26	C J	38		
PCB 27 (BZ)	3.9	J	19		
PCB 28 (BZ)	500	C B	38		
PCB 29 (BZ)	26	C J	38		
PCB 30 (BZ)	23	C J B	38		
PCB 31 (BZ)	170	B	19		
PCB 32 (BZ)	45		19		
PCB 33 (BZ)	57	C B	38		
PCB 34 (BZ)	3.2	J	19		
PCB 35 (BZ)	3.4	J	19		
PCB 36 (BZ)	7.3	J Q	19		
PCB 37 (BZ)	34		19		

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units....:	pg/g
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.95 U		19		
PCB 39 (BZ)	3.5	J	19		
PCB 40 (BZ)	170	C	38		
PCB 41 (BZ)	0.95 U		19		
PCB 42 (BZ)	44		19		
PCB 43 (BZ)	5.9	J	19		
PCB 44 (BZ)	700	C B	57		
PCB 45 (BZ)	3.2	J	19		
PCB 46 (BZ)	3.2	J	19		
PCB 47 (BZ)	700	C B	57		
PCB 48 (BZ)	21		19		
PCB 49 (BZ)	290	C	38		
PCB 50 (BZ)	43	C B	38		
PCB 51 (BZ)	11	J	19		
PCB 52 (BZ)	780	B	19		
PCB 53 (BZ)	43	C B	38		
PCB 54 (BZ)	0.95 U		19		
PCB 55 (BZ)	1.9 U		19		
PCB 56 (BZ)	140		19		
PCB 57 (BZ)	2.4	J Q	19		
PCB 58 (BZ)	3.1	J Q	19		
PCB 59 (BZ)	61	C	57		
PCB 60 (BZ)	210		19		
PCB 61 (BZ)	2000	C B	76		
PCB 62 (BZ)	61	C	57		
PCB 63 (BZ)	93		19		
PCB 64 (BZ)	150	B	19		
PCB 65 (BZ)	700	C B	57		
PCB 66 (BZ)	1100	B	19		
PCB 67 (BZ)	21		19		
PCB 68 (BZ)	27		19		
PCB 69 (BZ)	290	C	38		
PCB 70 (BZ)	2000	C B	76		
PCB 71 (BZ)	170	C	38		
PCB 72 (BZ)	21		19		
PCB 73 (BZ)	0.95 U		19		
PCB 74 (BZ)	2000	C B	76		

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	61	C	57		
PCB 76 (BZ)	2000	C B	76		
PCB 77 (BZ)	56		1.9	0.0001	0.0056
PCB 78 (BZ)	0.95 U		19		
PCB 79 (BZ)	19	Q	19		
PCB 80 (BZ)	0.95 U		19		
PCB 81 (BZ)	2.8		1.9	0.0003	0.00084
PCB 82 (BZ)	100		19		
PCB 83 (BZ)	0.95 U		19		
PCB 84 (BZ)	110		19		
PCB 85 (BZ)	780	C	57		
PCB 86 (BZ)	1200	C	110		
PCB 87 (BZ)	1200	C	110		
PCB 88 (BZ)	65	C	38		
PCB 89 (BZ)	4.1	J	19		
PCB 90 (BZ)	2400	C B	57		
PCB 91 (BZ)	65	C	38		
PCB 92 (BZ)	170		19		
PCB 93 (BZ)	26	C J	38		
PCB 94 (BZ)	6.0	J	19		
PCB 95 (BZ)	400	B	19		
PCB 96 (BZ)	0.95 U		19		
PCB 97 (BZ)	1200	C	110		
PCB 98 (BZ)	31	C J	38		
PCB 100 (BZ)	26	C J	38		
PCB 101 (BZ)	2400	C B	57		
PCB 102 (BZ)	31	C J	38		
PCB 103 (BZ)	6.2	J	19		
PCB 104 (BZ)	0.95 U		19		
PCB 105 (BZ)	1800	B	1.9	0.00003	0.054
PCB 106 (BZ)	1.9 U		19		
PCB 107 (BZ)/109 (IUPAC)	440		19		
PCB 108 (BZ)/107 (IUPAC)	130	C	38		
PCB 109 (BZ)/108 (IUPAC)	1200	C	110		
PCB 110 (BZ)	3600	C B	38		
PCB 111 (BZ)	6.7	J	19		
PCB 112 (BZ)	0.95 U		19		

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 113 (BZ)	2400	C B	57		
PCB 114 (BZ)	150		1.9	0.00003	0.0045
PCB 115 (BZ)	3600	C B	38		
PCB 116 (BZ)	780	C	57		
PCB 117 (BZ)	780	C	57		
PCB 118 (BZ)	6500	E B	1.9	0.00003	0.20
PCB 119 (BZ)	1200	C	110		
PCB 120 (BZ)	27		19		
PCB 121 (BZ)	0.95 U		19		
PCB 122 (BZ)	48		19		
PCB 123 (BZ)	81		1.9	0.00003	0.0024
PCB 124 (BZ)	130	C	38		
PCB 125 (BZ)	1200	C	110		
PCB 126 (BZ)	9.1	Q	1.9	0.1	0.91
PCB 127 (BZ)	5.3	J Q	19		
PCB 128 (BZ)	530	C	38		
PCB 129 (BZ)	4300	C B	57		
PCB 130 (BZ)	160		19		
PCB 131 (BZ)	11	J	19		
PCB 132 (BZ)	140		19		
PCB 133 (BZ)	46		19		
PCB 134 (BZ)	35	C J	38		
PCB 135 (BZ)	130	C	38		
PCB 136 (BZ)	12	J	19		
PCB 137 (BZ)	190		19		
PCB 138 (BZ)	4300	C B	57		
PCB 139 (BZ)	84	C	38		
PCB 140 (BZ)	84	C	38		
PCB 141 (BZ)	190		19		
PCB 142 (BZ)	0.95 U		19		
PCB 143 (BZ)	35	C J	38		
PCB 144 (BZ)	18	J	19		
PCB 145 (BZ)	0.95 U		19		
PCB 146 (BZ)	690		19		
PCB 147 (BZ)	740	C B	38		
PCB 148 (BZ)	1.1	J Q	19		
PCB 149 (BZ)	740	C B	38		

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 150 (BZ)	0.95 U		19		
PCB 151 (BZ)	130	C	38		
PCB 152 (BZ)	0.72	J	19		
PCB 153 (BZ)	4400	C E	38		
PCB 154 (BZ)	59		19		
PCB 155 (BZ)	0.95 U		19		
PCB 156 (BZ)	870	C	3.8	0.00003	0.026
PCB 157 (BZ)	870	C	3.8	0.00003	0.026
PCB 158 (BZ)	600		19		
PCB 159 (BZ)	0.96	J Q	19		
PCB 160 (BZ)	0.95 U		19		
PCB 161 (BZ)	0.95 U		19		
PCB 162 (BZ)	33		19		
PCB 163 (BZ)	4300	C B	57		
PCB 164 (BZ)	130		19		
PCB 165 (BZ)	1.0	J Q	19		
PCB 166 (BZ)	530	C	38		
PCB 167 (BZ)	290		1.9	0.00003	0.0087
PCB 168 (BZ)	4400	C E	38		
PCB 169 (BZ)	0.95 U		1.9	0.03	0.028
PCB 170 (BZ)	190		19		
PCB 171 (BZ)	100	C	38		
PCB 172 (BZ)	71		19		
PCB 173 (BZ)	100	C	38		
PCB 174 (BZ)	61		19		
PCB 175 (BZ)	4.4	J	19		
PCB 176 (BZ)	3.0	J	19		
PCB 177 (BZ)	110		19		
PCB 178 (BZ)	40		19		
PCB 179 (BZ)	7.8	J	19		
PCB 180 (BZ)	660	C	38		
PCB 181 (BZ)	13	J	19		
PCB 182 (BZ)	4.1	J	19		
PCB 183 (BZ)	200		19		
PCB 184 (BZ)	0.57	J Q	19		
PCB 185 (BZ)	1.9 U		19		
PCB 186 (BZ)	0.95 U		19		

450

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 187 (BZ)	450		19		
PCB 188 (BZ)	1.5	J Q	19		
PCB 189 (BZ)	13		1.9	0.00003	0.00039
PCB 190 (BZ)	43		19		
PCB 191 (BZ)	14	J	19		
PCB 192 (BZ)	0.95 U		19		
PCB 193 (BZ)	660	C	38		
PCB 194 (BZ)	28		19		
PCB 195 (BZ)	9.8	J	19		
PCB 196 (BZ)	32		19		
PCB 197 (BZ)	2.6	J	19		
PCB 198 (BZ)	97	C	38		
PCB 199 (BZ)/200 (IUPAC)	1.9 U		19		
PCB 200 (BZ)/201 (IUPAC)	8.3	J	19		
PCB 201 (BZ)/199 (IUPAC)	97	C	38		
PCB 202 (BZ)	20		19		
PCB 203 (BZ)	34		19		
PCB 204 (BZ)	0.95 U		19		
PCB 205 (BZ)	0.95 U		19		
PCB 206 (BZ)	9.3	J	19		
PCB 207 (BZ)	2.8	J	19		
PCB 208 (BZ)	8.8	J	19		
PCB 209 (BZ)	6.1	J Q	19		
Monochlorobiphenyl (total)	5.5		19		
Dichlorobiphenyl (total)	140		19		
Trichlorobiphenyl (total)	1000		19		
Tetrachlorobiphenyl (total)	6100		19		
Pentachlorobiphenyl (total)	22000		19		
Hexachlorobiphenyl (total)	14000		19		
Heptachlorobiphenyl (total)	2000		19		
Octachlorobiphenyl (total)	230		19		
Nonachlorobiphenyl (total)	21		19		
Total TEQ Concentration					1.3

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	41		5.0 - 145
13C12-PCB 3	47		5.0 - 145
13C12-PCB 4	37		5.0 - 145
13C12-PCB 15	59		5.0 - 145
13C12-PCB 19	42		5.0 - 145
13C12-PCB 37	71		5.0 - 145
13C12-PCB 54	40		5.0 - 145
13C12-PCB 77	79		10 - 145
13C12-PCB 81	80		10 - 145
13C12-PCB 104	52		10 - 145
13C12-PCB 105	78		10 - 145
13C12-PCB 114	76		10 - 145
13C12-PCB 118	76		10 - 145
13C12-PCB 123	77		10 - 145
13C12-PCB 126	80		10 - 145
13C12-PCB 155	70		10 - 145
13C12-PCB 156	103	C	10 - 145
13C12-PCB 157	103	C	10 - 145
13C12-PCB 167	101		10 - 145
13C12-PCB 169	95		10 - 145
13C12-PCB 188	79		10 - 145
13C12-PCB 189	100		10 - 145
13C12-PCB 202	86		10 - 145
13C12-PCB 205	83		10 - 145
13C12-PCB 206	76		10 - 145
13C12-PCB 208	87		10 - 145
13C12-PCB 209	72		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	66	5.0 - 145
13C12-PCB 178	74	10 - 145
13C12-PCB 111	77	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	**Work Order #....:**	MQN8R1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.95	**Units.....:**	pg/g
Initial Wgt/Vol :	10.52 g	**Analyst ID....:**	Sylvia H. Krenn		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organizatioo meeting io Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
E	Estimated result. Result concentration exceeds the calibration range.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 013	Work Order #....:	MQN8R2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	4.75	Units.....:	pg/g
Initial Wgt/Vol :	10.52 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 99 (BZ)	3700		95		
PCB 118 (BZ)	6400	B	9.5	0.00003	0.19
PCB 153 (BZ)	4500	C	190		
PCB 168 (BZ)	4500	C	190		

Total TEQ Concentration 0.19

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 104	51		10 - 145
13C12-PCB 105	75		10 - 145
13C12-PCB 114	75		10 - 145
13C12-PCB 118	77		10 - 145
13C12-PCB 123	78		10 - 145
13C12-PCB 126	74		10 - 145
13C12-PCB 155	68		10 - 145
13C12-PCB 156	98	C	10 - 145
13C12-PCB 157	98	C	10 - 145
13C12-PCB 167	97		10 - 145
13C12-PCB 169	98		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	71	5.0 - 145
13C12-PCB 178	74	10 - 145
13C12-PCB 111	74	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	1	Units.....:	pg/g
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.0	J	20		
PCB 2 (BZ)	2.5	J	20		
PCB 3 (BZ)	2.0	J	20		
PCB 4 (BZ)	10 U		20		
PCB 5 (BZ)	10 U		20		
PCB 6 (BZ)	7.4	J	20		
PCB 7 (BZ)	10 U		20		
PCB 8 (BZ)	31		20		
PCB 9 (BZ)	10 U		20		
PCB 10 (BZ)	10 U		20		
PCB 11 (BZ)	91		20		
PCB 12 (BZ)	20 U		40		
PCB 13 (BZ)	20 U		40		
PCB 14 (BZ)	10 U		20		
PCB 15 (BZ)	14	J	20		
PCB 16 (BZ)	1.4	J	20		
PCB 17 (BZ)	6.7	J B	20		
PCB 18 (BZ)	16	C J B	40		
PCB 19 (BZ)	1.6	J Q	20		
PCB 20 (BZ)	370	C B	40		
PCB 21 (BZ)	39	C J B	40		
PCB 22 (BZ)	56	B	20		
PCB 23 (BZ)	1.0 U		20		
PCB 24 (BZ)	1.0 U		20		
PCB 25 (BZ)	17	J	20		
PCB 26 (BZ)	40	C	40		
PCB 27 (BZ)	2.4	J	20		
PCB 28 (BZ)	370	C B	40		
PCB 29 (BZ)	40	C	40		
PCB 30 (BZ)	16	C J B	40		
PCB 31 (BZ)	200	B	20		
PCB 32 (BZ)	44		20		
PCB 33 (BZ)	39	C J B	40		
PCB 34 (BZ)	1.9	J Q	20		
PCB 35 (BZ)	2.7	J	20		
PCB 36 (BZ)	11	J	20		
PCB 37 (BZ)	45		20		

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	1	Units.....:	pg/g
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	1.0 U		20		
PCB 39 (BZ)	1.6	J	20		
PCB 40 (BZ)	97	C	40		
PCB 41 (BZ)	1.0 U		20		
PCB 42 (BZ)	47		20		
PCB 43 (BZ)	3.2	J	20		
PCB 44 (BZ)	480	C B	60		
PCB 45 (BZ)	2.7	J	20		
PCB 46 (BZ)	1.0 U		20		
PCB 47 (BZ)	480	C B	60		
PCB 48 (BZ)	9.9	J	20		
PCB 49 (BZ)	390	C	40		
PCB 50 (BZ)	15	C J B	40		
PCB 51 (BZ)	5.7	J	20		
PCB 52 (BZ)	1300	B	20		
PCB 53 (BZ)	15	C J B	40		
PCB 54 (BZ)	1.0 U		20		
PCB 55 (BZ)	2.0 U		20		
PCB 56 (BZ)	210		20		
PCB 57 (BZ)	2.9	J	20		
PCB 58 (BZ)	3.1	J	20		
PCB 59 (BZ)	42	C J	60		
PCB 60 (BZ)	200		20		
PCB 61 (BZ)	2100	C B	80		
PCB 62 (BZ)	42	C J	60		
PCB 63 (BZ)	61		20		
PCB 64 (BZ)	280	B	20		
PCB 65 (BZ)	480	C B	60		
PCB 66 (BZ)	1200	B	20		
PCB 67 (BZ)	22		20		
PCB 68 (BZ)	18	J	20		
PCB 69 (BZ)	390	C	40		
PCB 70 (BZ)	2100	C B	80		
PCB 71 (BZ)	97	C	40		
PCB 72 (BZ)	25		20		
PCB 73 (BZ)	1.0 U		20		
PCB 74 (BZ)	2100	C B	80		

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix.....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	1	Units.....:	pg/g
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	42	C J	60		
PCB 76 (BZ)	2100	C B	80		
PCB 77 (BZ)	72		2.0	0.0001	0.0072
PCB 78 (BZ)	1.0 U		20		
PCB 79 (BZ)	16	J	20		
PCB 80 (BZ)	1.0 U		20		
PCB 81 (BZ)	4.4		2.0	0.0003	0.0013
PCB 82 (BZ)	74		20		
PCB 83 (BZ)	1.0 U		20		
PCB 84 (BZ)	47		20		
PCB 85 (BZ)	690	C	60		
PCB 86 (BZ)	920	C	120		
PCB 87 (BZ)	920	C	120		
PCB 88 (BZ)	160	C	40		
PCB 89 (BZ)	2.9	J	20		
PCB 90 (BZ)	3800	C B	60		
PCB 91 (BZ)	160	C	40		
PCB 92 (BZ)	290		20		
PCB 93 (BZ)	19	C J	40		
PCB 94 (BZ)	2.6	J Q	20		
PCB 95 (BZ)	350	B	20		
PCB 96 (BZ)	1.0 U		20		
PCB 97 (BZ)	920	C	120		
PCB 98 (BZ)	16	C J	40		
PCB 100 (BZ)	19	C J	40		
PCB 101 (BZ)	3800	C B	60		
PCB 102 (BZ)	16	C J	40		
PCB 103 (BZ)	7.0	J	20		
PCB 104 (BZ)	1.0 U		20		
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	410		20		
PCB 108 (BZ)/107 (IUPAC)	160	C	40		
PCB 109 (BZ)/108 (IUPAC)	920	C	120		
PCB 110 (BZ)	3500	C B	40		
PCB 111 (BZ)	6.1	J Q	20		
PCB 112 (BZ)	1.0 U		20		
PCB 113 (BZ)	3800	C B	60		

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	1	Units.....:	pg/g
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 114 (BZ)	120		2.0	0.00003	0.0036
PCB 115 (BZ)	3500	C B	40		
PCB 116 (BZ)	690	C	60		
PCB 117 (BZ)	690	C	60		
PCB 119 (BZ)	920	C	120		
PCB 120 (BZ)	29		20		
PCB 121 (BZ)	1.0 U		20		
PCB 122 (BZ)	48		20		
PCB 123 (BZ)	63		2.0	0.00003	0.0019
PCB 124 (BZ)	160	C	40		
PCB 125 (BZ)	920	C	120		
PCB 126 (BZ)	17		2.0	0.1	1.7
PCB 127 (BZ)	6.7	J	20		
PCB 128 (BZ)	640	C	40		
PCB 129 (BZ)	5200	C B	60		
PCB 130 (BZ)	230		20		
PCB 131 (BZ)	6.4	J Q	20		
PCB 132 (BZ)	170		20		
PCB 133 (BZ)	73		20		
PCB 134 (BZ)	23	C J	40		
PCB 135 (BZ)	180	C	40		
PCB 136 (BZ)	9.9	J	20		
PCB 137 (BZ)	150		20		
PCB 138 (BZ)	5200	C B	60		
PCB 139 (BZ)	72	C	40		
PCB 140 (BZ)	72	C	40		
PCB 141 (BZ)	280		20		
PCB 142 (BZ)	1.0 U		20		
PCB 143 (BZ)	23	C J	40		
PCB 144 (BZ)	31		20		
PCB 145 (BZ)	1.0 U		20		
PCB 146 (BZ)	730		20		
PCB 147 (BZ)	1400	C B	40		
PCB 148 (BZ)	1.4	J	20		
PCB 149 (BZ)	1400	C B	40		
PCB 150 (BZ)	1.1	J	20		
PCB 151 (BZ)	180	C	40		

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	1	Units.....:	pg/g
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 152 (BZ)	1.0 U		20		
PCB 154 (BZ)	55		20		
PCB 155 (BZ)	1.6	J	20		
PCB 156 (BZ)	920	C	4.0	0.00003	0.028
PCB 157 (BZ)	920	C	4.0	0.00003	0.028
PCB 158 (BZ)	590		20		
PCB 159 (BZ)	1.9	J Q	20		
PCB 160 (BZ)	1.0 U		20		
PCB 161 (BZ)	1.0 U		20		
PCB 162 (BZ)	33		20		
PCB 163 (BZ)	5200	C B	60		
PCB 164 (BZ)	180		20		
PCB 165 (BZ)	1.4	J Q	20		
PCB 166 (BZ)	640	C	40		
PCB 167 (BZ)	280		2.0	0.00003	0.0084
PCB 169 (BZ)	1.0 U		2.0	0.03	0.030
PCB 170 (BZ)	380		20		
PCB 171 (BZ)	140	C	40		
PCB 172 (BZ)	100		20		
PCB 173 (BZ)	140	C	40		
PCB 174 (BZ)	120		20		
PCB 175 (BZ)	11	J	20		
PCB 176 (BZ)	8.0	J	20		
PCB 177 (BZ)	240		20		
PCB 178 (BZ)	80		20		
PCB 179 (BZ)	17	J	20		
PCB 180 (BZ)	980	C	40		
PCB 181 (BZ)	13	J	20		
PCB 182 (BZ)	3.3	J Q	20		
PCB 183 (BZ)	240		20		
PCB 184 (BZ)	0.90	J	20		
PCB 185 (BZ)	2.0 U		20		
PCB 186 (BZ)	1.0 U		20		
PCB 187 (BZ)	690		20		
PCB 188 (BZ)	2.7	J Q	20		
PCB 189 (BZ)	20		2.0	0.00003	0.00060
PCB 190 (BZ)	70		20		

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	1	Units.....:	pg/g
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 191 (BZ)	22		20		
PCB 192 (BZ)	1.0 U		20		
PCB 193 (BZ)	980	C	40		
PCB 194 (BZ)	96		20		
PCB 195 (BZ)	28		20		
PCB 196 (BZ)	61		20		
PCB 197 (BZ)	6.6	J	20		
PCB 198 (BZ)	210	C	40		
PCB 199 (BZ)/200 (IUPAC)	2.0 U		20		
PCB 200 (BZ)/201 (IUPAC)	19	J	20		
PCB 201 (BZ)/199 (IUPAC)	210	C	40		
PCB 202 (BZ)	45		20		
PCB 203 (BZ)	65		20		
PCB 204 (BZ)	1.0 U		20		
PCB 205 (BZ)	1.0	J	20		
PCB 206 (BZ)	27		20		
PCB 207 (BZ)	6.8	J	20		
PCB 208 (BZ)	19	J	20		
PCB 209 (BZ)	16	J	20		
Monochlorobiphenyl (total)	6.6		20		
Dichlorobiphenyl (total)	140		20		
Trichlorobiphenyl (total)	850		20		
Tetrachlorobiphenyl (total)	6500		20		
Pentachlorobiphenyl (total)	22000		20		
Hexachlorobiphenyl (total)	16000		20		
Heptachlorobiphenyl (total)	3100		20		
Octachlorobiphenyl (total)	530		20		
Nonachlorobiphenyl (total)	53		20		
Total TEQ Concentration					1.8

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V1AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	1	Units.....:	pg/g
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	42		5.0 - 145
13C12-PCB 3	44		5.0 - 145
13C12-PCB 4	37		5.0 - 145
13C12-PCB 15	52		5.0 - 145
13C12-PCB 19	40		5.0 - 145
13C12-PCB 37	66		5.0 - 145
13C12-PCB 54	38		5.0 - 145
13C12-PCB 77	73		10 - 145
13C12-PCB 81	72		10 - 145
13C12-PCB 104	45		10 - 145
13C12-PCB 105	70		10 - 145
13C12-PCB 114	67		10 - 145
13C12-PCB 118	69		10 - 145
13C12-PCB 123	68		10 - 145
13C12-PCB 126	72		10 - 145
13C12-PCB 155	62		10 - 145
13C12-PCB 156	91	C	10 - 145
13C12-PCB 157	91	C	10 - 145
13C12-PCB 167	89		10 - 145
13C12-PCB 169	87		10 - 145
13C12-PCB 188	65		10 - 145
13C12-PCB 189	88		10 - 145
13C12-PCB 202	71		10 - 145
13C12-PCB 205	75		10 - 145
13C12-PCB 206	72		10 - 145
13C12-PCB 208	76		10 - 145
13C12-PCB 209	67		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	58	5.0 - 145
13C12-PCB 178	66	10 - 145
13C12-PCB 111	66	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	**Work Order #....:**	MQN8V1AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	1	**Units.....:**	pg/g
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 014	Work Order #....:	MQN8V2AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	5	Units.....:	pg/g
Initial Wgt/Vol :	10 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 99 (BZ)	2800		100		
PCB 105 (BZ)	2000	B	10	0.00003	0.060
PCB 118 (BZ)	6100	B	10	0.00003	0.18
PCB 153 (BZ)	4500	C	100		
PCB 168 (BZ)	4500	C	100		

Total TEQ Concentration 0.24

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 104	49	10 - 145
13C12-PCB 105	68	10 - 145
13C12-PCB 114	68	10 - 145
13C12-PCB 118	73	10 - 145
13C12-PCB 123	73	10 - 145
13C12-PCB 126	73	10 - 145
13C12-PCB 155	65	10 - 145
13C12-PCB 156	96	10 - 145
13C12-PCB 157	96	10 - 145
13C12-PCB 167	96	10 - 145
13C12-PCB 169	88	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 178	69	10 - 145
13C12-PCB 111	67	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	1.9 U		19		
PCB 2 (BZ)	1.4	J	19		
PCB 3 (BZ)	1.0	J Q	19		
PCB 4 (BZ)	9.7 U		19		
PCB 5 (BZ)	9.7 U		19		
PCB 6 (BZ)	9.7 U		19		
PCB 7 (BZ)	9.7 U		19		
PCB 8 (BZ)	15	J	19		
PCB 9 (BZ)	9.7 U		19		
PCB 10 (BZ)	9.7 U		19		
PCB 11 (BZ)	47		19		
PCB 12 (BZ)	19 U		39		
PCB 13 (BZ)	19 U		39		
PCB 14 (BZ)	9.7 U		19		
PCB 15 (BZ)	8.5	J	19		
PCB 16 (BZ)	0.97 U		19		
PCB 17 (BZ)	2.4	J B	19		
PCB 18 (BZ)	6.3	C J B	39		
PCB 19 (BZ)	0.97 U		19		
PCB 20 (BZ)	160	C B	39		
PCB 21 (BZ)	15	C J B	39		
PCB 22 (BZ)	27	B	19		
PCB 23 (BZ)	0.97 U		19		
PCB 24 (BZ)	0.97 U		19		
PCB 25 (BZ)	8.3	J	19		
PCB 26 (BZ)	20	C J	39		
PCB 27 (BZ)	1.0	J	19		
PCB 28 (BZ)	160	C B	39		
PCB 29 (BZ)	20	C J	39		
PCB 30 (BZ)	6.3	C J B	39		
PCB 31 (BZ)	90	B	19		
PCB 32 (BZ)	20		19		
PCB 33 (BZ)	15	C J B	39		
PCB 34 (BZ)	0.97 U		19		
PCB 35 (BZ)	1.9 U		19		
PCB 36 (BZ)	5.9	J	19		
PCB 37 (BZ)	21		19		

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.97 U		19		
PCB 39 (BZ)	0.97 U		19		
PCB 40 (BZ)	48	C	39		
PCB 41 (BZ)	0.97 U		19		
PCB 42 (BZ)	21		19		
PCB 43 (BZ)	0.69	J Q	19		
PCB 44 (BZ)	240	C B	58		
PCB 45 (BZ)	1.2	J Q	19		
PCB 46 (BZ)	0.97 U		19		
PCB 47 (BZ)	240	C B	58		
PCB 48 (BZ)	0.97 U		19		
PCB 49 (BZ)	190	C	39		
PCB 50 (BZ)	6.5	C J B	39		
PCB 51 (BZ)	2.7	J	19		
PCB 52 (BZ)	450	B	19		
PCB 53 (BZ)	6.5	C J B	39		
PCB 54 (BZ)	0.97 U		19		
PCB 55 (BZ)	1.9 U	J	19		
PCB 56 (BZ)	100		19		
PCB 57 (BZ)	1.2	J Q	19		
PCB 58 (BZ)	1.1	J Q	19		
PCB 59 (BZ)	19	C J	58		
PCB 60 (BZ)	80		19		
PCB 61 (BZ)	830	C B	78		
PCB 62 (BZ)	19	C J	58		
PCB 63 (BZ)	23		19		
PCB 64 (BZ)	130	B	19		
PCB 65 (BZ)	240	C B	58		
PCB 66 (BZ)	460	B	19		
PCB 67 (BZ)	12	J	19		
PCB 68 (BZ)	8.8	J	19		
PCB 69 (BZ)	190	C	39		
PCB 70 (BZ)	830	C B	78		
PCB 71 (BZ)	48	C	39		
PCB 72 (BZ)	10	J	19		
PCB 73 (BZ)	0.97 U		19		
PCB 74 (BZ)	830	C B	78		

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	19	C J	58		
PCB 76 (BZ)	830	C B	78		
PCB 77 (BZ)	26		1.9	0.0001	0.0026
PCB 78 (BZ)	0.97 U		19		
PCB 79 (BZ)	7.4	J	19		
PCB 80 (BZ)	0.97 U		19		
PCB 81 (BZ)	1.8	J Q	1.9	0.0003	0.00054
PCB 82 (BZ)	32		19		
PCB 83 (BZ)	0.97 U		19		
PCB 84 (BZ)	21		19		
PCB 85 (BZ)	270	C	58		
PCB 86 (BZ)	470	C	120		
PCB 87 (BZ)	470	C	120		
PCB 88 (BZ)	71	C	39		
PCB 89 (BZ)	0.97 U		19		
PCB 90 (BZ)	1400	C B	58		
PCB 91 (BZ)	71	C	39		
PCB 92 (BZ)	110		19		
PCB 93 (BZ)	9.5	C J	39		
PCB 94 (BZ)	0.97 U		19		
PCB 95 (BZ)	120	B	19		
PCB 96 (BZ)	0.97 U		19		
PCB 97 (BZ)	470	C	120		
PCB 98 (BZ)	5.4	C J	39		
PCB 99 (BZ)	1200		19		
PCB 100 (BZ)	9.5	C J	39		
PCB 101 (BZ)	1400	C B	58		
PCB 102 (BZ)	5.4	C J	39		
PCB 103 (BZ)	3.6	J	19		
PCB 104 (BZ)	0.97 U		19		
PCB 105 (BZ)	740	B	1.9	0.00003	0.022
PCB 106 (BZ)	1.9 U		19		
PCB 107 (BZ)/109 (IUPAC)	150		19		
PCB 108 (BZ)/107 (IUPAC)	55	C	39		
PCB 109 (BZ)/108 (IUPAC)	470	C	120		
PCB 110 (BZ)	1600	C B	39		
PCB 111 (BZ)	0.97 U		19		

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.97 U		19		
PCB 113 (BZ)	1400	C B	58		
PCB 114 (BZ)	39		1.9	0.00003	0.0012
PCB 115 (BZ)	1600	C B	39		
PCB 116 (BZ)	270	C	58		
PCB 117 (BZ)	270	C	58		
PCB 119 (BZ)	470	C	120		
PCB 120 (BZ)	11	J	19		
PCB 121 (BZ)	0.97 U		19		
PCB 122 (BZ)	19	J	19		
PCB 123 (BZ)	26		1.9	0.00003	0.00078
PCB 124 (BZ)	55	C	39		
PCB 125 (BZ)	470	C	120		
PCB 126 (BZ)	6.0		1.9	0.1	0.60
PCB 127 (BZ)	0.97 U		19		
PCB 128 (BZ)	270	C	39		
PCB 129 (BZ)	1900	C B	58		
PCB 130 (BZ)	77		19		
PCB 131 (BZ)	3.6	J	19		
PCB 132 (BZ)	62		19		
PCB 133 (BZ)	21		19		
PCB 134 (BZ)	7.0	C J Q	39		
PCB 135 (BZ)	69	C	39		
PCB 136 (BZ)	4.7	J	19		
PCB 137 (BZ)	55		19		
PCB 138 (BZ)	1900	C B	58		
PCB 139 (BZ)	33	C	39		
PCB 140 (BZ)	33	C	39		
PCB 141 (BZ)	110		19		
PCB 142 (BZ)	0.97 U		19		
PCB 143 (BZ)	7.0	C J Q	39		
PCB 144 (BZ)	15	J	19		
PCB 145 (BZ)	0.97 U		19		
PCB 146 (BZ)	270		19		
PCB 147 (BZ)	530	C B	39		
PCB 148 (BZ)	0.97 U		19		
PCB 149 (BZ)	530	C B	39		

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 150 (BZ)	0.97 U		19		
PCB 151 (BZ)	69	C	39		
PCB 152 (BZ)	0.97 U		19		
PCB 153 (BZ)	1700	C	39		
PCB 154 (BZ)	23		19		
PCB 155 (BZ)	0.97 U		19		
PCB 156 (BZ)	340	C	3.9	0.00003	0.010
PCB 157 (BZ)	340	C	3.9	0.00003	0.010
PCB 158 (BZ)	230		19		
PCB 159 (BZ)	0.97 U		19		
PCB 160 (BZ)	0.97 U		19		
PCB 161 (BZ)	0.97 U		19		
PCB 162 (BZ)	11	J	19		
PCB 163 (BZ)	1900	C B	58		
PCB 164 (BZ)	70		19		
PCB 165 (BZ)	0.97 U		19		
PCB 166 (BZ)	270	C	39		
PCB 167 (BZ)	110		1.9	0.00003	0.0033
PCB 168 (BZ)	1700	C	39		
PCB 169 (BZ)	0.97 U		1.9	0.03	0.029
PCB 170 (BZ)	150		19		
PCB 171 (BZ)	62	C	39		
PCB 172 (BZ)	40		19		
PCB 173 (BZ)	62	C	39		
PCB 174 (BZ)	40		19		
PCB 175 (BZ)	4.5	J	19		
PCB 176 (BZ)	2.5	J Q	19		
PCB 177 (BZ)	76		19		
PCB 178 (BZ)	26		19		
PCB 179 (BZ)	5.2	J	19		
PCB 180 (BZ)	390	C	39		
PCB 181 (BZ)	3.7	J Q	19		
PCB 182 (BZ)	1.5	J Q	19		
PCB 183 (BZ)	99		19		
PCB 184 (BZ)	0.97 U		19		
PCB 185 (BZ)	6.4	J	19		
PCB 186 (BZ)	0.97 U		19		

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X1AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units....:	pg/g
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 187 (BZ)	270		19		
PCB 188 (BZ)	1.9	J Q	19		
PCB 189 (BZ)	7.4		1.9	0.00003	0.00022
PCB 190 (BZ)	28		19		
PCB 191 (BZ)	9.2	J	19		
PCB 192 (BZ)	0.97 U		19		
PCB 193 (BZ)	390	C	39		
PCB 194 (BZ)	43		19		
PCB 195 (BZ)	12	J	19		
PCB 196 (BZ)	30		19		
PCB 197 (BZ)	2.7	J Q	19		
PCB 198 (BZ)	92	C	39		
PCB 199 (BZ)/200 (IUPAC)	1.9 U		19		
PCB 200 (BZ)/201 (IUPAC)	9.8	J	19		
PCB 201 (BZ)/199 (IUPAC)	92	C	39		
PCB 202 (BZ)	18	J	19		
PCB 203 (BZ)	31		19		
PCB 204 (BZ)	0.97 U		19		
PCB 205 (BZ)	0.97 U		19		
PCB 206 (BZ)	14	J	19		
PCB 207 (BZ)	4.9	J	19		
PCB 208 (BZ)	10	J	19		
PCB 209 (BZ)	9.8	J	19		
Monochlorobiphenyl (total)	2.4		19		
Dichlorobiphenyl (total)	70		19		
Trichlorobiphenyl (total)	380		19		
Tetrachlorobiphenyl (total)	2700		19		
Pentachlorobiphenyl (total)	8700		19		
Hexachlorobiphenyl (total)	6000		19		
Heptachlorobiphenyl (total)	1200		19		
Octachlorobiphenyl (total)	240		19		
Nonachlorobiphenyl (total)	29		19		
Total TEQ Concentration					0.68

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	**Work Order #....:**	MQN8X1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.97	**Units.....:**	pg/g
Initial Wgt/Vol :	10.27 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	44		5.0 - 145
13C12-PCB 3	48		5.0 - 145
13C12-PCB 4	39		5.0 - 145
13C12-PCB 15	56		5.0 - 145
13C12-PCB 19	44		5.0 - 145
13C12-PCB 37	70		5.0 - 145
13C12-PCB 54	42		5.0 - 145
13C12-PCB 77	79		10 - 145
13C12-PCB 81	78		10 - 145
13C12-PCB 104	54		10 - 145
13C12-PCB 105	74		10 - 145
13C12-PCB 114	76		10 - 145
13C12-PCB 118	75		10 - 145
13C12-PCB 123	76		10 - 145
13C12-PCB 126	78		10 - 145
13C12-PCB 155	69		10 - 145
13C12-PCB 156	99	C	10 - 145
13C12-PCB 157	99	C	10 - 145
13C12-PCB 167	98		10 - 145
13C12-PCB 169	95		10 - 145
13C12-PCB 188	77		10 - 145
13C12-PCB 189	95		10 - 145
13C12-PCB 202	81		10 - 145
13C12-PCB 205	82		10 - 145
13C12-PCB 206	77		10 - 145
13C12-PCB 208	83		10 - 145
13C12-PCB 209	72		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	67	5.0 - 145
13C12-PCB 178	73	10 - 145
13C12-PCB 111	75	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	**Work Order #....:**	MQN8X1AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.97	**Units.....:**	pg/g
Initial Wgt/Vol :	10.27 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of tbe World Health Organization meeting in Geneva, Switzerland. June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 015	Work Order #....:	MQN8X2AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/25/12		
Prep Batch # ....:	2047107	Dilution Factor....:	1.95	Units.....:	pg/g
Initial Wgt/Vol :	10.27 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 118 (BZ)	2400	B	3.9	0.00003	0.072

Total TEQ Concentration 0.072

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 118	75	10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 111	73	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	1.9 U		20		
PCB 2 (BZ)	1.9 U		20		
PCB 3 (BZ)	0.97 U		20		
PCB 4 (BZ)	9.7 U		20		
PCB 5 (BZ)	9.7 U		20		
PCB 6 (BZ)	9.7 U		20		
PCB 7 (BZ)	9.7 U		20		
PCB 8 (BZ)	9.7 U		20		
PCB 9 (BZ)	9.7 U		20		
PCB 10 (BZ)	9.7 U		20		
PCB 11 (BZ)	8.6	J	20		
PCB 12 (BZ)	19 U		39		
PCB 13 (BZ)	19 U		39		
PCB 14 (BZ)	9.7 U		20		
PCB 15 (BZ)	9.7 U		20		
PCB 16 (BZ)	0.97 U		20		
PCB 17 (BZ)	0.97 U		20		
PCB 18 (BZ)	1.9 U	C J B	39		
PCB 19 (BZ)	0.97 U		20		
PCB 20 (BZ)	2.5	C J B	39		
PCB 21 (BZ)	1.9 U		39		
PCB 22 (BZ)	0.97 U		20		
PCB 23 (BZ)	0.97 U		20		
PCB 24 (BZ)	0.97 U		20		
PCB 25 (BZ)	0.97 U		20		
PCB 26 (BZ)	1.9 U		39		
PCB 27 (BZ)	0.97 U		20		
PCB 28 (BZ)	2.5	C J B	39		
PCB 29 (BZ)	1.9 U		39		
PCB 30 (BZ)	1.9 U	C J B	39		
PCB 31 (BZ)	1.2	J B	20		
PCB 32 (BZ)	0.52	J	20		
PCB 33 (BZ)	1.9 U		39		
PCB 34 (BZ)	0.97 U		20		
PCB 35 (BZ)	1.9 U		20		
PCB 36 (BZ)	0.97 U		20		
PCB 37 (BZ)	0.97 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.97 U		20		
PCB 39 (BZ)	0.97 U		20		
PCB 40 (BZ)	0.85	C J	39		
PCB 41 (BZ)	0.97 U		20		
PCB 42 (BZ)	0.97 U		20		
PCB 43 (BZ)	0.97 U		20		
PCB 44 (BZ)	11	C J B	59		
PCB 45 (BZ)	0.97 U		20		
PCB 46 (BZ)	0.97 U		20		
PCB 47 (BZ)	11	C J B	59		
PCB 48 (BZ)	0.97 U		20		
PCB 49 (BZ)	1.1	C J Q	39		
PCB 50 (BZ)	1.9 U		39		
PCB 51 (BZ)	1.6	J Q	20		
PCB 52 (BZ)	2.8	J B	20		
PCB 53 (BZ)	1.9 U		39		
PCB 54 (BZ)	0.97 U		20		
PCB 55 (BZ)	1.9 U		20		
PCB 56 (BZ)	0.97 U	J	20		
PCB 57 (BZ)	0.97 U		20		
PCB 58 (BZ)	0.97 U		20		
PCB 59 (BZ)	2.9 U		59		
PCB 60 (BZ)	1.2	J Q	20		
PCB 61 (BZ)	7.6	C J B	78		
PCB 62 (BZ)	2.9 U		59		
PCB 63 (BZ)	0.97 U		20		
PCB 64 (BZ)	1.3	J B	20		
PCB 65 (BZ)	11	C J B	59		
PCB 66 (BZ)	6.8	J Q B	20		
PCB 67 (BZ)	0.97 U		20		
PCB 68 (BZ)	1.9 U	J	20		
PCB 69 (BZ)	1.1	C J Q	39		
PCB 70 (BZ)	7.6	C J B	78		
PCB 71 (BZ)	0.85	C J	39		
PCB 72 (BZ)	0.97 U		20		
PCB 73 (BZ)	0.97 U		20		
PCB 74 (BZ)	7.6	C J B	78		

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	2.9 U		59		
PCB 76 (BZ)	7.6	C J B	78		
PCB 77 (BZ)	0.77	J	2.0	0.0001	0.000077
PCB 78 (BZ)	0.97 U		20		
PCB 79 (BZ)	0.97 U		20		
PCB 80 (BZ)	0.97 U		20		
PCB 81 (BZ)	0.97 U		2.0	0.0003	0.00029
PCB 82 (BZ)	0.97 U		20		
PCB 83 (BZ)	0.97 U		20		
PCB 84 (BZ)	0.97 U		20		
PCB 85 (BZ)	4.6	C J	59		
PCB 86 (BZ)	3.0	C J	120		
PCB 87 (BZ)	3.0	C J	120		
PCB 88 (BZ)	1.9 U	C J	39		
PCB 89 (BZ)	0.97 U		20		
PCB 90 (BZ)	7.3	C J B	59		
PCB 91 (BZ)	1.9 U	C J	39		
PCB 92 (BZ)	0.97 U		20		
PCB 93 (BZ)	1.9 U		39		
PCB 94 (BZ)	0.97 U		20		
PCB 95 (BZ)	2.4	J B	20		
PCB 96 (BZ)	0.97 U		20		
PCB 97 (BZ)	3.0	C J	120		
PCB 98 (BZ)	1.9 U		39		
PCB 99 (BZ)	18	J	20		
PCB 100 (BZ)	1.9 U		39		
PCB 101 (BZ)	7.3	C J B	59		
PCB 102 (BZ)	1.9 U		39		
PCB 103 (BZ)	0.97 U		20		
PCB 104 (BZ)	0.97 U		20		
PCB 105 (BZ)	9.8	B	2.0	0.00003	0.00029
PCB 106 (BZ)	1.9 U		20		
PCB 107 (BZ)/109 (IUPAC)	1.9	J Q	20		
PCB 108 (BZ)/107 (IUPAC)	5.8 U		39		
PCB 109 (BZ)/108 (IUPAC)	3.0	C J	120		
PCB 110 (BZ)	18	C J B	39		
PCB 111 (BZ)	0.97 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.97 U		20		
PCB 113 (BZ)	7.3	C J B	59		
PCB 114 (BZ)	0.97 U		2.0	0.00003	0.000029
PCB 115 (BZ)	18	C J B	39		
PCB 116 (BZ)	4.6	C J	59		
PCB 117 (BZ)	4.6	C J	59		
PCB 118 (BZ)	32	B	2.0	0.00003	0.00096
PCB 119 (BZ)	3.0	C J	120		
PCB 120 (BZ)	0.97 U		20		
PCB 121 (BZ)	0.97 U		20		
PCB 122 (BZ)	0.97 U		20		
PCB 123 (BZ)	0.97 U		2.0	0.00003	0.000029
PCB 124 (BZ)	1.9 U		39		
PCB 125 (BZ)	3.0	C J	120		
PCB 126 (BZ)	0.97 U		2.0	0.1	0.097
PCB 127 (BZ)	0.97 U		20		
PCB 128 (BZ)	4.5	C J	39		
PCB 129 (BZ)	33	C B	59		
PCB 130 (BZ)	1.6	J	20		
PCB 131 (BZ)	0.97 U		20		
PCB 132 (BZ)	0.97 U		20		
PCB 133 (BZ)	0.97 U		20		
PCB 134 (BZ)	1.9 U		39		
PCB 135 (BZ)	1.9 U		39		
PCB 136 (BZ)	0.97 U		20		
PCB 137 (BZ)	0.62	J Q	20		
PCB 138 (BZ)	33	C B	59		
PCB 139 (BZ)	1.9 U		39		
PCB 140 (BZ)	1.9 U		39		
PCB 141 (BZ)	0.97 U		20		
PCB 142 (BZ)	0.97 U		20		
PCB 143 (BZ)	1.9 U		39		
PCB 144 (BZ)	0.97 U		20		
PCB 145 (BZ)	0.97 U		20		
PCB 146 (BZ)	4.0	J Q	20		
PCB 147 (BZ)	4.4	C J Q B	39		
PCB 148 (BZ)	0.97 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	4.4	C J Q B	39		
PCB 150 (BZ)	0.97 U		20		
PCB 151 (BZ)	1.9 U		39		
PCB 152 (BZ)	0.97 U		20		
PCB 153 (BZ)	35	C	39		
PCB 154 (BZ)	0.97 U		20		
PCB 155 (BZ)	0.97 U		20		
PCB 156 (BZ)	5.2	C	3.9	0.00003	0.00016
PCB 157 (BZ)	5.2	C	3.9	0.00003	0.00016
PCB 158 (BZ)	3.4	J	20		
PCB 159 (BZ)	0.97 U		20		
PCB 160 (BZ)	0.97 U		20		
PCB 161 (BZ)	0.97 U		20		
PCB 162 (BZ)	0.97 U	J Q	20		
PCB 163 (BZ)	33	C B	59		
PCB 164 (BZ)	0.97 U		20		
PCB 165 (BZ)	0.97 U		20		
PCB 166 (BZ)	4.5	C J	39		
PCB 167 (BZ)	1.8	J	2.0	0.00003	0.000054
PCB 168 (BZ)	35	C	39		
PCB 169 (BZ)	0.97 U		2.0	0.03	0.029
PCB 170 (BZ)	5.8	J Q	20		
PCB 171 (BZ)	1.7	C J	39		
PCB 172 (BZ)	1.3	J	20		
PCB 173 (BZ)	1.7	C J	39		
PCB 174 (BZ)	0.97 U		20		
PCB 175 (BZ)	0.97 U		20		
PCB 176 (BZ)	0.97 U		20		
PCB 177 (BZ)	2.7	J	20		
PCB 178 (BZ)	1.5	J	20		
PCB 179 (BZ)	0.97 U		20		
PCB 180 (BZ)	11	C J	39		
PCB 181 (BZ)	1.9 U		20		
PCB 182 (BZ)	0.97 U		20		
PCB 183 (BZ)	2.6	J	20		
PCB 184 (BZ)	0.97 U		20		
PCB 185 (BZ)	1.9 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.97 U		20		
PCB 187 (BZ)	4.5	J	20		
PCB 188 (BZ)	0.97 U		20		
PCB 189 (BZ)	0.97 U		2.0	0.00003	0.000029
PCB 190 (BZ)	0.97 U		20		
PCB 191 (BZ)	0.97 U		20		
PCB 192 (BZ)	0.97 U		20		
PCB 193 (BZ)	11	C J	39		
PCB 194 (BZ)	1.4	J	20		
PCB 195 (BZ)	0.97 U		20		
PCB 196 (BZ)	1.0	J	20		
PCB 197 (BZ)	0.97 U		20		
PCB 198 (BZ)	2.6	C J	39		
PCB 199 (BZ)/200 (IUPAC)	1.9 U		20		
PCB 200 (BZ)/201 (IUPAC)	0.97 U		20		
PCB 201 (BZ)/199 (IUPAC)	2.6	C J	39		
PCB 202 (BZ)	0.97	J	20		
PCB 203 (BZ)	1.2	J	20		
PCB 204 (BZ)	0.97 U		20		
PCB 205 (BZ)	0.97 U		20		
PCB 206 (BZ)	0.97 U		20		
PCB 207 (BZ)	0.97 U		20		
PCB 208 (BZ)	1.5	J Q	20		
PCB 209 (BZ)	1.9 U	J	20		
Monochlorobiphenyl (total)	ND		20		0
Dichlorobiphenyl (total)	8.6		20		
Trichlorobiphenyl (total)	4.9		20		
Tetrachlorobiphenyl (total)	37		20		
Pentachlorobiphenyl (total)	97		20		
Hexachlorobiphenyl (total)	94		20		
Heptachlorobiphenyl (total)	31		20		
Octachlorobiphenyl (total)	7.3		20		
Nonachlorobiphenyl (total)	1.5		20		
Total TEQ Concentration					0.13

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	Work Order #....:	MQN811AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.22 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	40		5.0 - 145
13C12-PCB 3	42		5.0 - 145
13C12-PCB 4	34		5.0 - 145
13C12-PCB 15	50		5.0 - 145
13C12-PCB 19	38		5.0 - 145
13C12-PCB 37	62		5.0 - 145
13C12-PCB 54	36		5.0 - 145
13C12-PCB 77	66		10 - 145
13C12-PCB 81	66		10 - 145
13C12-PCB 104	43		10 - 145
13C12-PCB 105	62		10 - 145
13C12-PCB 114	62		10 - 145
13C12-PCB 118	63		10 - 145
13C12-PCB 123	64		10 - 145
13C12-PCB 126	65		10 - 145
13C12-PCB 155	57		10 - 145
13C12-PCB 156	82	C	10 - 145
13C12-PCB 157	82	C	10 - 145
13C12-PCB 167	82		10 - 145
13C12-PCB 169	77		10 - 145
13C12-PCB 188	65		10 - 145
13C12-PCB 189	80		10 - 145
13C12-PCB 202	69		10 - 145
13C12-PCB 205	70		10 - 145
13C12-PCB 206	65		10 - 145
13C12-PCB 208	71		10 - 145
13C12-PCB 209	63		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	58	5.0 - 145
13C12-PCB 178	61	10 - 145
13C12-PCB 111	62	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 016	**Work Order #....:**	MQN811AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.97	**Units.....:**	pg/g
Initial Wgt/Vol :	10.22 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.0 U		20		
PCB 2 (BZ)	2.0 U		20		
PCB 3 (BZ)	0.99 U		20		
PCB 4 (BZ)	9.9 U		20		
PCB 5 (BZ)	9.9 U		20		
PCB 6 (BZ)	9.9 U		20		
PCB 7 (BZ)	9.9 U		20		
PCB 8 (BZ)	9.9 U		20		
PCB 9 (BZ)	9.9 U		20		
PCB 10 (BZ)	9.9 U		20		
PCB 11 (BZ)	21		20		
PCB 12 (BZ)	20 U		40		
PCB 13 (BZ)	20 U		40		
PCB 14 (BZ)	9.9 U		20		
PCB 15 (BZ)	9.9 U		20		
PCB 16 (BZ)	0.99 U		20		
PCB 17 (BZ)	0.64	J B	20		
PCB 18 (BZ)	2.0 U	C J B	40		
PCB 19 (BZ)	0.99 U		20		
PCB 20 (BZ)	2.7	C J Q B	40		
PCB 21 (BZ)	2.0 U	C J Q B	40		
PCB 22 (BZ)	0.71	J B	20		
PCB 23 (BZ)	0.99 U		20		
PCB 24 (BZ)	0.99 U		20		
PCB 25 (BZ)	0.99 U		20		
PCB 26 (BZ)	2.0 U		40		
PCB 27 (BZ)	0.99 U		20		
PCB 28 (BZ)	2.7	C J Q B	40		
PCB 29 (BZ)	2.0 U		40		
PCB 30 (BZ)	2.0 U	C J B	40		
PCB 31 (BZ)	1.5	J Q B	20		
PCB 32 (BZ)	0.59	J	20		
PCB 33 (BZ)	2.0 U	C J Q B	40		
PCB 34 (BZ)	0.99 U		20		
PCB 35 (BZ)	2.0 U		20		
PCB 36 (BZ)	0.99 U		20		
PCB 37 (BZ)	0.99 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.99 U		20		
PCB 39 (BZ)	0.99 U		20		
PCB 40 (BZ)	1.1	C J	40		
PCB 41 (BZ)	0.99 U		20		
PCB 42 (BZ)	0.99 U		20		
PCB 43 (BZ)	0.99 U		20		
PCB 44 (BZ)	11	C J B	59		
PCB 45 (BZ)	0.99 U		20		
PCB 46 (BZ)	0.99 U		20		
PCB 47 (BZ)	11	C J B	59		
PCB 48 (BZ)	0.99 U		20		
PCB 49 (BZ)	0.85	C J Q	40		
PCB 50 (BZ)	2.0 U		40		
PCB 51 (BZ)	1.0	J Q	20		
PCB 52 (BZ)	3.8	J B	20		
PCB 53 (BZ)	2.0 U		40		
PCB 54 (BZ)	0.99 U		20		
PCB 55 (BZ)	2.0 U		20		
PCB 56 (BZ)	0.99 U	J Q	20		
PCB 57 (BZ)	0.99 U		20		
PCB 58 (BZ)	0.99 U		20		
PCB 59 (BZ)	3.0 U		59		
PCB 60 (BZ)	2.0 U	J Q	20		
PCB 61 (BZ)	7.4	C J Q B	79		
PCB 62 (BZ)	3.0 U		59		
PCB 63 (BZ)	0.99 U		20		
PCB 64 (BZ)	1.2	J Q B	20		
PCB 65 (BZ)	11	C J B	59		
PCB 66 (BZ)	8.2	J B	20		
PCB 67 (BZ)	0.99 U		20		
PCB 68 (BZ)	2.0 U	J Q	20		
PCB 69 (BZ)	0.85	C J Q	40		
PCB 70 (BZ)	7.4	C J Q B	79		
PCB 71 (BZ)	1.1	C J	40		
PCB 72 (BZ)	0.99 U		20		
PCB 73 (BZ)	0.99 U		20		
PCB 74 (BZ)	7.4	C J Q B	79		

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	3.0 U		59		
PCB 76 (BZ)	7.4	C J Q B	79		
PCB 77 (BZ)	0.54	J	2.0	0.0001	0.000054
PCB 78 (BZ)	0.99 U		20		
PCB 79 (BZ)	0.99 U		20		
PCB 80 (BZ)	0.99 U		20		
PCB 81 (BZ)	0.99 U		2.0	0.0003	0.00030
PCB 82 (BZ)	0.99 U		20		
PCB 83 (BZ)	0.99 U		20		
PCB 84 (BZ)	1.3	J Q	20		
PCB 85 (BZ)	4.7	C J Q	59		
PCB 86 (BZ)	3.4	C J Q	120		
PCB 87 (BZ)	3.4	C J Q	120		
PCB 88 (BZ)	1.4	C J Q	40		
PCB 89 (BZ)	0.99 U		20		
PCB 90 (BZ)	9.2	C J B	59		
PCB 91 (BZ)	1.4	C J Q	40		
PCB 92 (BZ)	1.4	J	20		
PCB 93 (BZ)	2.0 U		40		
PCB 94 (BZ)	0.99 U		20		
PCB 95 (BZ)	3.5	J B	20		
PCB 96 (BZ)	0.99 U		20		
PCB 97 (BZ)	3.4	C J Q	120		
PCB 98 (BZ)	2.0 U		40		
PCB 99 (BZ)	20	J	20		
PCB 100 (BZ)	2.0 U		40		
PCB 101 (BZ)	9.2	C J B	59		
PCB 102 (BZ)	2.0 U		40		
PCB 103 (BZ)	0.99 U		20		
PCB 104 (BZ)	0.99 U		20		
PCB 105 (BZ)	11	B	2.0	0.00003	0.00033
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	2.2	J Q	20		
PCB 108 (BZ)/107 (IUPAC)	5.9 U		40		
PCB 109 (BZ)/108 (IUPAC)	3.4	C J Q	120		
PCB 110 (BZ)	21	C J B	40		
PCB 111 (BZ)	0.99 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.99 U		20		
PCB 113 (BZ)	9.2	C J B	59		
PCB 114 (BZ)	0.99 U		2.0	0.00003	0.000030
PCB 115 (BZ)	21	C J B	40		
PCB 116 (BZ)	4.7	C J Q	59		
PCB 117 (BZ)	4.7	C J Q	59		
PCB 118 (BZ)	34	B	2.0	0.00003	0.0010
PCB 119 (BZ)	3.4	C J Q	120		
PCB 120 (BZ)	0.99 U		20		
PCB 121 (BZ)	0.99 U		20		
PCB 122 (BZ)	0.99 U		20		
PCB 123 (BZ)	0.99 U		2.0	0.00003	0.000030
PCB 124 (BZ)	2.0 U		40		
PCB 125 (BZ)	3.4	C J Q	120		
PCB 126 (BZ)	0.99 U		2.0	0.1	0.099
PCB 127 (BZ)	0.99 U		20		
PCB 128 (BZ)	4.8	C J	40		
PCB 129 (BZ)	35	C J B	59		
PCB 130 (BZ)	2.2	J	20		
PCB 131 (BZ)	0.99 U		20		
PCB 132 (BZ)	0.71	J Q	20		
PCB 133 (BZ)	0.99 U		20		
PCB 134 (BZ)	2.0 U		40		
PCB 135 (BZ)	1.4	C J Q	40		
PCB 136 (BZ)	0.99 U	J Q	20		
PCB 137 (BZ)	0.99 U	J Q	20		
PCB 138 (BZ)	35	C J B	59		
PCB 139 (BZ)	2.0 U		40		
PCB 140 (BZ)	2.0 U		40		
PCB 141 (BZ)	1.0	J Q	20		
PCB 142 (BZ)	0.99 U		20		
PCB 143 (BZ)	2.0 U		40		
PCB 144 (BZ)	0.99 U		20		
PCB 145 (BZ)	0.99 U		20		
PCB 146 (BZ)	4.4	J	20		
PCB 147 (BZ)	6.4	C J B	40		
PCB 148 (BZ)	0.99 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	6.4	C J B	40		
PCB 150 (BZ)	0.99 U		20		
PCB 151 (BZ)	1.4	C J Q	40		
PCB 152 (BZ)	0.99 U		20		
PCB 153 (BZ)	37	C	40		
PCB 154 (BZ)	0.80	J Q	20		
PCB 155 (BZ)	0.99 U		20		
PCB 156 (BZ)	4.9	C	4.0	0.00003	0.00015
PCB 157 (BZ)	4.9	C	4.0	0.00003	0.00015
PCB 158 (BZ)	3.5	J	20		
PCB 159 (BZ)	0.99 U		20		
PCB 160 (BZ)	0.99 U		20		
PCB 161 (BZ)	0.99 U		20		
PCB 162 (BZ)	0.99 U	J Q	20		
PCB 163 (BZ)	35	C J B	59		
PCB 164 (BZ)	0.99 U		20		
PCB 165 (BZ)	0.99 U		20		
PCB 166 (BZ)	4.8	C J	40		
PCB 167 (BZ)	1.6	J	2.0	0.00003	0.000048
PCB 168 (BZ)	37	C	40		
PCB 169 (BZ)	0.99 U		2.0	0.03	0.030
PCB 170 (BZ)	5.0	J Q	20		
PCB 171 (BZ)	1.7	C J	40		
PCB 172 (BZ)	1.4	J	20		
PCB 173 (BZ)	1.7	C J	40		
PCB 174 (BZ)	0.99 U		20		
PCB 175 (BZ)	0.99 U		20		
PCB 176 (BZ)	0.99 U		20		
PCB 177 (BZ)	2.9	J	20		
PCB 178 (BZ)	1.4	J Q	20		
PCB 179 (BZ)	0.99 U		20		
PCB 180 (BZ)	12	C J	40		
PCB 181 (BZ)	2.0 U		20		
PCB 182 (BZ)	0.99 U		20		
PCB 183 (BZ)	2.6	J Q	20		
PCB 184 (BZ)	0.99 U		20		
PCB 185 (BZ)	2.0 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.99 U		20		
PCB 187 (BZ)	4.7	J	20		
PCB 188 (BZ)	0.99 U		20		
PCB 189 (BZ)	0.99 U	J	2.0	0.00003	0.000030
PCB 190 (BZ)	0.99 U		20		
PCB 191 (BZ)	0.99 U		20		
PCB 192 (BZ)	0.99 U		20		
PCB 193 (BZ)	12	C J	40		
PCB 194 (BZ)	1.2	J Q	20		
PCB 195 (BZ)	0.99 U		20		
PCB 196 (BZ)	1.0	J Q	20		
PCB 197 (BZ)	0.99 U	J Q	20		
PCB 198 (BZ)	2.3	C J Q	40		
PCB 199 (BZ)/200 (IUPAC)	2.0 U		20		
PCB 200 (BZ)/201 (IUPAC)	0.99 U	J	20		
PCB 201 (BZ)/199 (IUPAC)	2.3	C J Q	40		
PCB 202 (BZ)	1.3	J	20		
PCB 203 (BZ)	0.92	J Q	20		
PCB 204 (BZ)	0.99 U		20		
PCB 205 (BZ)	0.99 U		20		
PCB 206 (BZ)	0.99 U		20		
PCB 207 (BZ)	0.99 U		20		
PCB 208 (BZ)	0.88	J Q	20		
PCB 209 (BZ)	2.0 U	J Q	20		
Monochlorobiphenyl (total)	ND		20		0
Dichlorobiphenyl (total)	21		20		
Trichlorobiphenyl (total)	7.4		20		
Tetrachlorobipbenyl (total)	37		20		
Pentachlorobiphenyl (total)	110		20		
Hexachlorobiphenyl (total)	100		20		
Heptachlorobiphenyl (total)	32		20		
Octachlorobiphenyl (total)	7.6		20		
Nonachlorobiphenyl (total)	0.88		20		
Total TEQ Concentration					0.13

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	Work Order #....:	MQN821AD	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.99	Units.....:	pg/g
Initial Wgt/Vol :	10.1 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	40		5.0 - 145
13C12-PCB 3	44		5.0 - 145
13C12-PCB 4	36		5.0 - 145
13C12-PCB 15	56		5.0 - 145
13C12-PCB 19	40		5.0 - 145
13C12-PCB 37	69		5.0 - 145
13C12-PCB 54	39		5.0 - 145
13C12-PCB 77	78		10 - 145
13C12-PCB 81	77		10 - 145
13C12-PCB 104	48		10 - 145
13C12-PCB 105	72		10 - 145
13C12-PCB 114	71		10 - 145
13C12-PCB 118	71		10 - 145
13C12-PCB 123	72		10 - 145
13C12-PCB 126	78		10 - 145
13C12-PCB 155	62		10 - 145
13C12-PCB 156	97	C	10 - 145
13C12-PCB 157	97	C	10 - 145
13C12-PCB 167	95		10 - 145
13C12-PCB 169	91		10 - 145
13C12-PCB 188	72		10 - 145
13C12-PCB 189	95		10 - 145
13C12-PCB 202	80		10 - 145
13C12-PCB 205	77		10 - 145
13C12-PCB 206	74		10 - 145
13C12-PCB 208	82		10 - 145
13C12-PCB 209	72		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	64	5.0 - 145
13C12-PCB 178	68	10 - 145
13C12-PCB 111	68	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 017	**Work Order #....:**	MQN821AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.99	**Units.....:**	pg/g
Initial Wgt/Vol :	10.1 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	2.0 U		20		
PCB 2 (BZ)	2.0 U		20		
PCB 3 (BZ)	0.98 U		20		
PCB 4 (BZ)	9.8 U		20		
PCB 5 (BZ)	9.8 U		20		
PCB 6 (BZ)	9.8 U		20		
PCB 7 (BZ)	9.8 U		20		
PCB 8 (BZ)	3.4	J	20		
PCB 9 (BZ)	9.8 U		20		
PCB 10 (BZ)	9.8 U		20		
PCB 11 (BZ)	14	J	20		
PCB 12 (BZ)	20 U		39		
PCB 13 (BZ)	20 U		39		
PCB 14 (BZ)	9.8 U		20		
PCB 15 (BZ)	9.8 U		20		
PCB 16 (BZ)	0.98 U		20		
PCB 17 (BZ)	0.98 U		20		
PCB 18 (BZ)	2.0 U	C J Q B	39		
PCB 19 (BZ)	0.98 U		20		
PCB 20 (BZ)	2.0	C J Q B	39		
PCB 21 (BZ)	2.0 U	C J B	39		
PCB 22 (BZ)	0.98 U		20		
PCB 23 (BZ)	0.98 U		20		
PCB 24 (BZ)	0.98 U		20		
PCB 25 (BZ)	0.98 U		20		
PCB 26 (BZ)	2.0 U		39		
PCB 27 (BZ)	0.98 U		20		
PCB 28 (BZ)	2.0	C J Q B	39		
PCB 29 (BZ)	2.0 U		39		
PCB 30 (BZ)	2.0 U	C J Q B	39		
PCB 31 (BZ)	1.4	J B	20		
PCB 32 (BZ)	0.98 U		20		
PCB 33 (BZ)	2.0 U	C J B	39		
PCB 34 (BZ)	0.98 U		20		
PCB 35 (BZ)	2.0 U		20		
PCB 36 (BZ)	0.98 U		20		
PCB 37 (BZ)	0.98 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.98 U		20		
PCB 39 (BZ)	0.98 U		20		
PCB 40 (BZ)	0.78	C J	39		
PCB 41 (BZ)	0.98 U		20		
PCB 42 (BZ)	0.98 U		20		
PCB 43 (BZ)	0.98 U		20		
PCB 44 (BZ)	10	C J B	59		
PCB 45 (BZ)	0.98 U		20		
PCB 46 (BZ)	0.98 U		20		
PCB 47 (BZ)	10	C J B	59		
PCB 48 (BZ)	0.98 U		20		
PCB 49 (BZ)	2.3	C J	39		
PCB 50 (BZ)	2.0 U		39		
PCB 51 (BZ)	1.6	J	20		
PCB 52 (BZ)	5.5	J B	20		
PCB 53 (BZ)	2.0 U		39		
PCB 54 (BZ)	0.98 U		20		
PCB 55 (BZ)	2.0 U		20		
PCB 56 (BZ)	0.98 U	J Q	20		
PCB 57 (BZ)	0.98 U		20		
PCB 58 (BZ)	0.98 U		20		
PCB 59 (BZ)	2.9 U		59		
PCB 60 (BZ)	2.0 U	J	20		
PCB 61 (BZ)	8.5	C J B	79		
PCB 62 (BZ)	2.9 U		59		
PCB 63 (BZ)	0.98 U		20		
PCB 64 (BZ)	1.0	J B	20		
PCB 65 (BZ)	10	C J B	59		
PCB 66 (BZ)	4.4	J B	20		
PCB 67 (BZ)	0.98 U		20		
PCB 68 (BZ)	2.0 U	J Q	20		
PCB 69 (BZ)	2.3	C J	39		
PCB 70 (BZ)	8.5	C J B	79		
PCB 71 (BZ)	0.78	C J	39		
PCB 72 (BZ)	0.98 U		20		
PCB 73 (BZ)	0.98 U		20		
PCB 74 (BZ)	8.5	C J B	79		

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	2.9 U		59		
PCB 76 (BZ)	8.5	C J B	79		
PCB 77 (BZ)	0.98 U		2.0	0.0001	0.000098
PCB 78 (BZ)	0.98 U		20		
PCB 79 (BZ)	0.98 U		20		
PCB 80 (BZ)	0.98 U		20		
PCB 81 (BZ)	0.98 U		2.0	0.0003	0.00029
PCB 82 (BZ)	0.98 U		20		
PCB 83 (BZ)	0.98 U		20		
PCB 84 (BZ)	1.9	J	20		
PCB 85 (BZ)	2.5	C J	59		
PCB 86 (BZ)	7.2	C J	120		
PCB 87 (BZ)	7.2	C J	120		
PCB 88 (BZ)	1.4	C J	39		
PCB 89 (BZ)	0.98 U		20		
PCB 90 (BZ)	16	C J B	59		
PCB 91 (BZ)	1.4	C J	39		
PCB 92 (BZ)	2.5	J Q	20		
PCB 93 (BZ)	2.0 U		39		
PCB 94 (BZ)	0.98 U		20		
PCB 95 (BZ)	5.9	J B	20		
PCB 96 (BZ)	0.98 U		20		
PCB 97 (BZ)	7.2	C J	120		
PCB 98 (BZ)	2.0 U		39		
PCB 99 (BZ)	9.8	J	20		
PCB 100 (BZ)	2.0 U		39		
PCB 101 (BZ)	16	C J B	59		
PCB 102 (BZ)	2.0 U		39		
PCB 103 (BZ)	0.98 U		20		
PCB 104 (BZ)	0.98 U		20		
PCB 105 (BZ)	4.8	B	2.0	0.00003	0.00014
PCB 106 (BZ)	2.0 U		20		
PCB 107 (BZ)/109 (IUPAC)	2.0 U	J Q	20		
PCB 108 (BZ)/107 (IUPAC)	5.9 U	C J Q	39		
PCB 109 (BZ)/108 (IUPAC)	7.2	C J	120		
PCB 110 (BZ)	15	C J B	39		
PCB 111 (BZ)	0.98 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.98 U		20		
PCB 113 (BZ)	16	C J B	59		
PCB 114 (BZ)	0.98 U	J Q	2.0	0.00003	0.000029
PCB 115 (BZ)	15	C J B	39		
PCB 116 (BZ)	2.5	C J	59		
PCB 117 (BZ)	2.5	C J	59		
PCB 118 (BZ)	14	B	2.0	0.00003	0.00042
PCB 119 (BZ)	7.2	C J	120		
PCB 120 (BZ)	0.98 U		20		
PCB 121 (BZ)	0.98 U		20		
PCB 122 (BZ)	0.98 U		20		
PCB 123 (BZ)	0.98 U	J Q	2.0	0.00003	0.000029
PCB 124 (BZ)	2.0 U	C J Q	39		
PCB 125 (BZ)	7.2	C J	120		
PCB 126 (BZ)	0.98 U		2.0	0.1	0.098
PCB 127 (BZ)	0.98 U		20		
PCB 128 (BZ)	1.2	C J	39		
PCB 129 (BZ)	10	C J B	59		
PCB 130 (BZ)	0.98 U		20		
PCB 131 (BZ)	0.98 U		20		
PCB 132 (BZ)	1.8	J Q	20		
PCB 133 (BZ)	0.98 U		20		
PCB 134 (BZ)	2.0 U		39		
PCB 135 (BZ)	2.3	C J	39		
PCB 136 (BZ)	0.71	J Q	20		
PCB 137 (BZ)	0.98 U		20		
PCB 138 (BZ)	10	C J B	59		
PCB 139 (BZ)	2.0 U		39		
PCB 140 (BZ)	2.0 U		39		
PCB 141 (BZ)	1.4	J	20		
PCB 142 (BZ)	0.98 U		20		
PCB 143 (BZ)	2.0 U		39		
PCB 144 (BZ)	0.98 U		20		
PCB 145 (BZ)	0.98 U		20		
PCB 146 (BZ)	1.5	J	20		
PCB 147 (BZ)	5.9	C J B	39		
PCB 148 (BZ)	0.98 U		20		

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	5.9	C J B	39		
PCB 150 (BZ)	0.98 U		20		
PCB 151 (BZ)	2.3	C J	39		
PCB 152 (BZ)	0.98 U		20		
PCB 153 (BZ)	11	C J	39		
PCB 154 (BZ)	0.98 U		20		
PCB 155 (BZ)	0.98 U		20		
PCB 156 (BZ)	1.5	C J	3.9	0.00003	0.000045
PCB 157 (BZ)	1.5	C J	3.9	0.00003	0.000045
PCB 158 (BZ)	1.5	J	20		
PCB 159 (BZ)	0.98 U		20		
PCB 160 (BZ)	0.98 U		20		
PCB 161 (BZ)	0.98 U		20		
PCB 162 (BZ)	0.98 U		20		
PCB 163 (BZ)	10	C J B	59		
PCB 164 (BZ)	0.98 U		20		
PCB 165 (BZ)	0.98 U		20		
PCB 166 (BZ)	1.2	C J	39		
PCB 167 (BZ)	0.70	J	2.0	0.00003	0.000021
PCB 168 (BZ)	11	C J	39		
PCB 169 (BZ)	0.98 U		2.0	0.03	0.029
PCB 170 (BZ)	2.5	J Q	20		
PCB 171 (BZ)	2.0 U		39		
PCB 172 (BZ)	0.98 U		20		
PCB 173 (BZ)	2.0 U		39		
PCB 174 (BZ)	0.98 U		20		
PCB 175 (BZ)	0.98 U		20		
PCB 176 (BZ)	0.98 U		20		
PCB 177 (BZ)	0.98 U		20		
PCB 178 (BZ)	0.98 U		20		
PCB 179 (BZ)	0.98 U		20		
PCB 180 (BZ)	2.7	C J Q	39		
PCB 181 (BZ)	2.0 U		20		
PCB 182 (BZ)	0.98 U		20		
PCB 183 (BZ)	2.0 U	J	20		
PCB 184 (BZ)	0.98 U		20		
PCB 185 (BZ)	2.0 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	Work Order #....:	MQN831AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/23/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.98	Units.....:	pg/g
Initial Wgt/Vol :	10.18 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.98 U		20		
PCB 187 (BZ)	0.88	J	20		
PCB 188 (BZ)	0.98 U		20		
PCB 189 (BZ)	0.98 U		2.0	0.00003	0.000029
PCB 190 (BZ)	0.98 U		20		
PCB 191 (BZ)	0.98 U		20		
PCB 192 (BZ)	0.98 U		20		
PCB 193 (BZ)	2.7	C J Q	39		
PCB 194 (BZ)	0.98 U		20		
PCB 195 (BZ)	0.98 U		20		
PCB 196 (BZ)	0.98 U		20		
PCB 197 (BZ)	0.98 U		20		
PCB 198 (BZ)	2.0 U		39		
PCB 199 (BZ)/200 (IUPAC)	2.0 U		20		
PCB 200 (BZ)/201 (IUPAC)	0.98 U		20		
PCB 201 (BZ)/199 (IUPAC)	0.98 U		39		
PCB 202 (BZ)	0.98 U		20		
PCB 203 (BZ)	0.98 U		20		
PCB 204 (BZ)	0.98 U		20		
PCB 205 (BZ)	0.98 U		20		
PCB 206 (BZ)	0.98 U		20		
PCB 207 (BZ)	0.98 U		20		
PCB 208 (BZ)	0.98 U		20		
PCB 209 (BZ)	2.0 U		20		
Monochlorobiphenyl (total)	ND		20		0
Dichlorobiphenyl (total)	17		20		
Trichlorobiphenyl (total)	4.8		20		
Tetrachlorobiphenyl (total)	37		20		
Pentachlorobiphenyl (total)	83		20		
Hexachlorobiphenyl (total)	40		20		
Heptachlorobiphenyl (total)	7.0		20		
Octachlorobiphenyl (total)	ND		20		0
Nonachlorobiphenyl (total)	ND		20		0
Total TEQ Concentration					0.13

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	**Work Order #....:**	MQN831AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.18 g	**Analyst ID....:**	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	42		5.0 - 145
13C12-PCB 3	44		5.0 - 145
13C12-PCB 4	36		5.0 - 145
13C12-PCB 15	52		5.0 - 145
13C12-PCB 19	41		5.0 - 145
13C12-PCB 37	65		5.0 - 145
13C12-PCB 54	38		5.0 - 145
13C12-PCB 77	72		10 - 145
13C12-PCB 81	72		10 - 145
13C12-PCB 104	45		10 - 145
13C12-PCB 105	68		10 - 145
13C12-PCB 114	67		10 - 145
13C12-PCB 118	67		10 - 145
13C12-PCB 123	67		10 - 145
13C12-PCB 126	72		10 - 145
13C12-PCB 155	59		10 - 145
13C12-PCB 156	92	C	10 - 145
13C12-PCB 157	92	C	10 - 145
13C12-PCB 167	90		10 - 145
13C12-PCB 169	88		10 - 145
13C12-PCB 188	63		10 - 145
13C12-PCB 189	87		10 - 145
13C12-PCB 202	69		10 - 145
13C12-PCB 205	72		10 - 145
13C12-PCB 206	68		10 - 145
13C12-PCB 208	74		10 - 145
13C12-PCB 209	64		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	60	5.0 - 145
13C12-PCB 178	65	10 - 145
13C12-PCB 111	67	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 018	**Work Order #....:**	MQN831AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/23/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.98	**Units.....:**	pg/g
Initial Wgt/Vol :	10.18 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	1.9 U		19		
PCB 2 (BZ)	1.9 U		19		
PCB 3 (BZ)	0.95 U		19		
PCB 4 (BZ)	9.5 U		19		
PCB 5 (BZ)	9.5 U		19		
PCB 6 (BZ)	9.5 U		19		
PCB 7 (BZ)	9.5 U		19		
PCB 8 (BZ)	6.8	J	19		
PCB 9 (BZ)	9.5 U		19		
PCB 10 (BZ)	9.5 U		19		
PCB 11 (BZ)	12	J	19		
PCB 12 (BZ)	19 U		38		
PCB 13 (BZ)	19 U		38		
PCB 14 (BZ)	9.5 U		19		
PCB 15 (BZ)	9.5 U	J	19		
PCB 16 (BZ)	2.2	J Q	19		
PCB 17 (BZ)	6.2	J B	19		
PCB 18 (BZ)	11	C J B	38		
PCB 19 (BZ)	2.6	J	19		
PCB 20 (BZ)	52	C B	38		
PCB 21 (BZ)	17	C J B	38		
PCB 22 (BZ)	10	J B	19		
PCB 23 (BZ)	0.95 U		19		
PCB 24 (BZ)	0.95 U		19		
PCB 25 (BZ)	4.0	J	19		
PCB 26 (BZ)	7.7	C J	38		
PCB 27 (BZ)	1.2	J	19		
PCB 28 (BZ)	52	C B	38		
PCB 29 (BZ)	7.7	C J	38		
PCB 30 (BZ)	11	C J B	38		
PCB 31 (BZ)	35	B	19		
PCB 32 (BZ)	12	J	19		
PCB 33 (BZ)	17	C J B	38		
PCB 34 (BZ)	0.63	J	19		
PCB 35 (BZ)	1.9 U		19		
PCB 36 (BZ)	4.1	J	19		
PCB 37 (BZ)	5.0	J	19		

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.95 U		19		
PCB 39 (BZ)	0.95 U		19		
PCB 40 (BZ)	33	C J	38		
PCB 41 (BZ)	1.5	J	19		
PCB 42 (BZ)	15	J	19		
PCB 43 (BZ)	1.9	J	19		
PCB 44 (BZ)	160	C B	57		
PCB 45 (BZ)	3.3	J	19		
PCB 46 (BZ)	1.6	J Q	19		
PCB 47 (BZ)	160	C B	57		
PCB 48 (BZ)	8.5	J	19		
PCB 49 (BZ)	150	C	38		
PCB 50 (BZ)	20	C B	38		
PCB 51 (BZ)	9.6	J	19		
PCB 52 (BZ)	440	B	19		
PCB 53 (BZ)	20	C B	38		
PCB 54 (BZ)	0.57	J Q	19		
PCB 55 (BZ)	1.9 U		19		
PCB 56 (BZ)	45		19		
PCB 57 (BZ)	0.95 U		19		
PCB 58 (BZ)	0.95 U		19		
PCB 59 (BZ)	10	C J	57		
PCB 60 (BZ)	24		19		
PCB 61 (BZ)	420	C B	77		
PCB 62 (BZ)	10	C J	57		
PCB 63 (BZ)	8.0	J	19		
PCB 64 (BZ)	55	B	19		
PCB 65 (BZ)	160	C B	57		
PCB 66 (BZ)	190	B	19		
PCB 67 (BZ)	5.4	J	19		
PCB 68 (BZ)	4.0	J	19		
PCB 69 (BZ)	150	C	38		
PCB 70 (BZ)	420	C B	77		
PCB 71 (BZ)	33	C J	38		
PCB 72 (BZ)	4.8	J	19		
PCB 73 (BZ)	0.95 U		19		
PCB 74 (BZ)	420	C B	77		

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	10	C J	57		
PCB 76 (BZ)	420	C B	77		
PCB 77 (BZ)	8.2		1.9	0.0001	0.00082
PCB 78 (BZ)	0.95 U		19		
PCB 79 (BZ)	4.8	J	19		
PCB 80 (BZ)	0.95 U		19		
PCB 81 (BZ)	0.95 U		1.9	0.0003	0.00029
PCB 82 (BZ)	35		19		
PCB 83 (BZ)	0.95 U		19		
PCB 84 (BZ)	120		19		
PCB 85 (BZ)	170	C	57		
PCB 86 (BZ)	520	C	110		
PCB 87 (BZ)	520	C	110		
PCB 88 (BZ)	100	C	38		
PCB 89 (BZ)	3.6	J	19		
PCB 90 (BZ)	1300	C B	57		
PCB 91 (BZ)	100	C	38		
PCB 92 (BZ)	230		19		
PCB 93 (BZ)	5.5	C J	38		
PCB 94 (BZ)	2.2	J	19		
PCB 95 (BZ)	540	B	19		
PCB 96 (BZ)	1.0	J Q	19		
PCB 97 (BZ)	520	C	110		
PCB 98 (BZ)	17	C J	38		
PCB 99 (BZ)	580		19		
PCB 100 (BZ)	5.5	C J	38		
PCB 101 (BZ)	1300	C B	57		
PCB 102 (BZ)	17	C J	38		
PCB 103 (BZ)	7.1	J	19		
PCB 104 (BZ)	0.95 U		19		
PCB 105 (BZ)	270	B	1.9	0.00003	0.0081
PCB 106 (BZ)	1.9 U		19		
PCB 107 (BZ)/109 (IUPAC)	69		19		
PCB 108 (BZ)/107 (IUPAC)	39	C	38		
PCB 109 (BZ)/108 (IUPAC)	520	C	110		
PCB 110 (BZ)	1100	C B	38		
PCB 111 (BZ)	0.96	J Q	19		

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.95 U		19		
PCB 113 (BZ)	1300	C B	57		
PCB 114 (BZ)	19		1.9	0.00003	0.00057
PCB 115 (BZ)	1100	C B	38		
PCB 116 (BZ)	170	C	57		
PCB 117 (BZ)	170	C	57		
PCB 118 (BZ)	970	B	1.9	0.00003	0.029
PCB 119 (BZ)	520	C	110		
PCB 120 (BZ)	5.0	J	19		
PCB 121 (BZ)	0.95 U		19		
PCB 122 (BZ)	9.8	J	19		
PCB 123 (BZ)	8.2		1.9	0.00003	0.00025
PCB 124 (BZ)	39	C	38		
PCB 125 (BZ)	520	C	110		
PCB 126 (BZ)	2.2		1.9	0.1	0.22
PCB 127 (BZ)	0.95 U		19		
PCB 128 (BZ)	160	C	38		
PCB 129 (BZ)	1100	C B	57		
PCB 130 (BZ)	78		19		
PCB 131 (BZ)	3.9	J	19		
PCB 132 (BZ)	220		19		
PCB 133 (BZ)	18	J	19		
PCB 134 (BZ)	28	C J	38		
PCB 135 (BZ)	210	C	38		
PCB 136 (BZ)	67		19		
PCB 137 (BZ)	42		19		
PCB 138 (BZ)	1100	C B	57		
PCB 139 (BZ)	20	C J	38		
PCB 140 (BZ)	20	C J	38		
PCB 141 (BZ)	160		19		
PCB 142 (BZ)	0.95 U		19		
PCB 143 (BZ)	28	C J	38		
PCB 144 (BZ)	29		19		
PCB 145 (BZ)	0.95 U		19		
PCB 146 (BZ)	140		19		
PCB 147 (BZ)	610	C B	38		
PCB 148 (BZ)	0.76	J Q	19		

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/2012 500

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	610	C B	38		
PCB 150 (BZ)	0.83	J Q	19		
PCB 151 (BZ)	210	C	38		
PCB 152 (BZ)	0.37	J Q	19		
PCB 153 (BZ)	900	C	38		
PCB 154 (BZ)	11	J	19		
PCB 155 (BZ)	0.95 U		19		
PCB 156 (BZ)	150	C	3.8	0.00003	0.0045
PCB 157 (BZ)	150	C	3.8	0.00003	0.0045
PCB 158 (BZ)	120		19		
PCB 159 (BZ)	2.2	J	19		
PCB 160 (BZ)	0.95 U		19		
PCB 161 (BZ)	0.95 U		19		
PCB 162 (BZ)	6.6	J	19		
PCB 163 (BZ)	1100	C B	57		
PCB 164 (BZ)	70		19		
PCB 165 (BZ)	0.95 U		19		
PCB 166 (BZ)	160	C	38		
PCB 167 (BZ)	55		1.9	0.00003	0.0016
PCB 168 (BZ)	900	C	38		
PCB 169 (BZ)	0.95 U		1.9	0.03	0.028
PCB 170 (BZ)	130		19		
PCB 171 (BZ)	44	C	38		
PCB 172 (BZ)	24		19		
PCB 173 (BZ)	44	C	38		
PCB 174 (BZ)	100		19		
PCB 175 (BZ)	3.8	J Q	19		
PCB 176 (BZ)	7.1	J	19		
PCB 177 (BZ)	81		19		
PCB 178 (BZ)	24		19		
PCB 179 (BZ)	29		19		
PCB 180 (BZ)	230	C	38		
PCB 181 (BZ)	2.9	J	19		
PCB 182 (BZ)	0.95 U		19		
PCB 183 (BZ)	61		19		
PCB 184 (BZ)	0.95 U		19		
PCB 185 (BZ)	7.2	J	19		

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.95 U		19		
PCB 187 (BZ)	120		19		
PCB 188 (BZ)	0.95 U		19		
PCB 189 (BZ)	4.5		1.9	0.00003	0.00014
PCB 190 (BZ)	21		19		
PCB 191 (BZ)	6.0	J	19		
PCB 192 (BZ)	0.95 U		19		
PCB 193 (BZ)	230	C	38		
PCB 194 (BZ)	25		19		
PCB 195 (BZ)	10	J	19		
PCB 196 (BZ)	15	J	19		
PCB 197 (BZ)	1.2	J Q	19		
PCB 198 (BZ)	45	C	38		
PCB 199 (BZ)/200 (IUPAC)	2.0	J Q	19		
PCB 200 (BZ)/201 (IUPAC)	4.1	J Q	19		
PCB 201 (BZ)/199 (IUPAC)	45	C	38		
PCB 202 (BZ)	11	J	19		
PCB 203 (BZ)	28		19		
PCB 204 (BZ)	0.95 U		19		
PCB 205 (BZ)	1.2	J	19		
PCB 206 (BZ)	14	J Q	19		
PCB 207 (BZ)	1.8	J Q	19		
PCB 208 (BZ)	6.0	J	19		
PCB 209 (BZ)	4.6	J Q	19		
Monochlorobiphenyl (total)	ND		19		0
Dichlorobiphenyl (total)	21		19		
Trichlorobiphenyl (total)	170		19		
Tetrachlorobiphenyl (total)	1600		19		
Pentachlorobiphenyl (total)	6100		19		
Hexachlorobiphenyl (total)	4200		19		
Heptachlorobiphenyl (total)	910		19		
Octachlorobiphenyl (total)	140		19		
Nonachlorobiphenyl (total)	21		19		
Total TEQ Concentration					0.30

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	Work Order #....:	MQN841AF	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.95	Units.....:	pg/g
Initial Wgt/Vol :	10.45 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	43		5.0 - 145
13C12-PCB 3	43		5.0 - 145
13C12-PCB 4	38		5.0 - 145
13C12-PCB 15	59		5.0 - 145
13C12-PCB 19	41		5.0 - 145
13C12-PCB 37	73		5.0 - 145
13C12-PCB 54	41		5.0 - 145
13C12-PCB 77	82		10 - 145
13C12-PCB 81	81		10 - 145
13C12-PCB 104	52		10 - 145
13C12-PCB 105	79		10 - 145
13C12-PCB 114	78		10 - 145
13C12-PCB 118	78		10 - 145
13C12-PCB 123	77		10 - 145
13C12-PCB 126	83		10 - 145
13C12-PCB 155	69		10 - 145
13C12-PCB 156	101	C	10 - 145
13C12-PCB 157	101	C	10 - 145
13C12-PCB 167	101		10 - 145
13C12-PCB 169	96		10 - 145
13C12-PCB 188	81		10 - 145
13C12-PCB 189	101		10 - 145
13C12-PCB 202	87		10 - 145
13C12-PCB 205	83		10 - 145
13C12-PCB 206	81		10 - 145
13C12-PCB 208	91		10 - 145
13C12-PCB 209	77		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	65	5.0 - 145
13C12-PCB 178	74	10 - 145
13C12-PCB 111	77	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 019	**Work Order #....:**	MQN841AF	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.95	**Units.....:**	pg/g
Initial Wgt/Vol :	10.45 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Healtb Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix.....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	1.9 U	J Q	20		
PCB 2 (BZ)	1.9 U		20		
PCB 3 (BZ)	0.97 U	J Q	20		
PCB 4 (BZ)	9.7 U		20		
PCB 5 (BZ)	9.7 U		20		
PCB 6 (BZ)	9.7 U		20		
PCB 7 (BZ)	9.7 U		20		
PCB 8 (BZ)	5.8	J	20		
PCB 9 (BZ)	9.7 U		20		
PCB 10 (BZ)	9.7 U		20		
PCB 11 (BZ)	11	J	20		
PCB 12 (BZ)	19 U		39		
PCB 13 (BZ)	19 U		39		
PCB 14 (BZ)	9.7 U		20		
PCB 15 (BZ)	9.7 U		20		
PCB 16 (BZ)	3.0	J	20		
PCB 17 (BZ)	5.2	J B	20		
PCB 18 (BZ)	11	C J B	39		
PCB 19 (BZ)	2.1	J	20		
PCB 20 (BZ)	42	C B	39		
PCB 21 (BZ)	11	C J B	39		
PCB 22 (BZ)	6.7	J Q B	20		
PCB 23 (BZ)	0.97 U		20		
PCB 24 (BZ)	0.97 U		20		
PCB 25 (BZ)	3.0	J Q	20		
PCB 26 (BZ)	6.4	C J Q	39		
PCB 27 (BZ)	0.84	J	20		
PCB 28 (BZ)	42	C B	39		
PCB 29 (BZ)	6.4	C J Q	39		
PCB 30 (BZ)	11	C J B	39		
PCB 31 (BZ)	28	B	20		
PCB 32 (BZ)	7.0	J	20		
PCB 33 (BZ)	11	C J B	39		
PCB 34 (BZ)	0.86	J Q	20		
PCB 35 (BZ)	1.9 U		20		
PCB 36 (BZ)	2.4	J	20		
PCB 37 (BZ)	2.4	J	20		

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	0.97 U		20		
PCB 39 (BZ)	0.97 U		20		
PCB 40 (BZ)	16	C J	39		
PCB 41 (BZ)	1.0	J	20		
PCB 42 (BZ)	10	J	20		
PCB 43 (BZ)	1.3	J	20		
PCB 44 (BZ)	95	C B	59		
PCB 45 (BZ)	3.9	J	20		
PCB 46 (BZ)	1.6	J	20		
PCB 47 (BZ)	95	C B	59		
PCB 48 (BZ)	6.3	J	20		
PCB 49 (BZ)	80	C	39		
PCB 50 (BZ)	8.3	C J B	39		
PCB 51 (BZ)	3.8	J	20		
PCB 52 (BZ)	210	B	20		
PCB 53 (BZ)	8.3	C J B	39		
PCB 54 (BZ)	0.97 U		20		
PCB 55 (BZ)	1.9 U	J Q	20		
PCB 56 (BZ)	27		20		
PCB 57 (BZ)	0.97 U		20		
PCB 58 (BZ)	0.97 U		20		
PCB 59 (BZ)	6.5	C J	59		
PCB 60 (BZ)	17	J	20		
PCB 61 (BZ)	210	C B	78		
PCB 62 (BZ)	6.5	C J	59		
PCB 63 (BZ)	4.7	J	20		
PCB 64 (BZ)	32	B	20		
PCB 65 (BZ)	95	C B	59		
PCB 66 (BZ)	120	B	20		
PCB 67 (BZ)	3.4	J Q	20		
PCB 68 (BZ)	2.5	J Q	20		
PCB 69 (BZ)	80	C	39		
PCB 70 (BZ)	210	C B	78		
PCB 71 (BZ)	16	C J	39		
PCB 72 (BZ)	2.7	J	20		
PCB 73 (BZ)	0.97 U		20		
PCB 74 (BZ)	210	C B	78		

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	6.5	C J	59		
PCB 76 (BZ)	210	C B	78		
PCB 77 (BZ)	4.3		2.0	0.0001	0.00043
PCB 78 (BZ)	0.97 U		20		
PCB 79 (BZ)	2.0	J	20		
PCB 80 (BZ)	0.97 U		20		
PCB 81 (BZ)	0.97 U		2.0	0.0003	0.00029
PCB 82 (BZ)	15	J	20		
PCB 83 (BZ)	0.97 U		20		
PCB 84 (BZ)	47		20		
PCB 85 (BZ)	75	C	59		
PCB 86 (BZ)	220	C	120		
PCB 87 (BZ)	220	C	120		
PCB 88 (BZ)	31	C J	39		
PCB 89 (BZ)	0.97 U		20		
PCB 90 (BZ)	550	C B	59		
PCB 91 (BZ)	31	C J	39		
PCB 92 (BZ)	95		20		
PCB 93 (BZ)	1.8	C J Q	39		
PCB 94 (BZ)	0.97 U		20		
PCB 95 (BZ)	180	B	20		
PCB 96 (BZ)	0.69	J	20		
PCB 97 (BZ)	220	C	120		
PCB 98 (BZ)	3.7	C J Q	39		
PCB 99 (BZ)	280		20		
PCB 100 (BZ)	1.8	C J Q	39		
PCB 101 (BZ)	550	C B	59		
PCB 102 (BZ)	3.7	C J Q	39		
PCB 103 (BZ)	3.0	J	20		
PCB 104 (BZ)	0.97 U		20		
PCB 105 (BZ)	130	B	2.0	0.00003	0.0039
PCB 106 (BZ)	1.9 U		20		
PCB 107 (BZ)/109 (IUPAC)	31		20		
PCB 108 (BZ)/107 (IUPAC)	16	C J	39		
PCB 109 (BZ)/108 (IUPAC)	220	C	120		
PCB 110 (BZ)	500	C B	39		
PCB 111 (BZ)	0.97 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	0.97 U		20		
PCB 113 (BZ)	550	C B	59		
PCB 114 (BZ)	9.4		2.0	0.00003	0.00028
PCB 115 (BZ)	500	C B	39		
PCB 116 (BZ)	75	C	59		
PCB 117 (BZ)	75	C	59		
PCB 118 (BZ)	440	B	2.0	0.00003	0.013
PCB 119 (BZ)	220	C	120		
PCB 120 (BZ)	2.5	J Q	20		
PCB 121 (BZ)	0.97 U		20		
PCB 122 (BZ)	4.5	J Q	20		
PCB 123 (BZ)	5.6		2.0	0.00003	0.00017
PCB 124 (BZ)	16	C J	39		
PCB 125 (BZ)	220	C	120		
PCB 126 (BZ)	1.2	J	2.0	0.1	0.12
PCB 127 (BZ)	0.97 U		20		
PCB 128 (BZ)	73	C	39		
PCB 129 (BZ)	490	C B	59		
PCB 130 (BZ)	29		20		
PCB 131 (BZ)	2.9	J	20		
PCB 132 (BZ)	69		20		
PCB 133 (BZ)	9.0	J	20		
PCB 134 (BZ)	14	C J	39		
PCB 135 (BZ)	83	C	39		
PCB 136 (BZ)	27		20		
PCB 137 (BZ)	17	J	20		
PCB 138 (BZ)	490	C B	59		
PCB 139 (BZ)	8.8	C J	39		
PCB 140 (BZ)	8.8	C J	39		
PCB 141 (BZ)	62		20		
PCB 142 (BZ)	0.97 U		20		
PCB 143 (BZ)	14	C J	39		
PCB 144 (BZ)	12	J	20		
PCB 145 (BZ)	0.97 U		20		
PCB 146 (BZ)	64		20		
PCB 147 (BZ)	160	C B	39		
PCB 148 (BZ)	0.97 U		20		

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	160	C B	39		
PCB 150 (BZ)	0.97 U		20		
PCB 151 (BZ)	83	C	39		
PCB 152 (BZ)	0.97 U		20		
PCB 153 (BZ)	420	C	39		
PCB 154 (BZ)	6.3	J	20		
PCB 155 (BZ)	0.97 U		20		
PCB 156 (BZ)	68	C	3.9	0.00003	0.0020
PCB 157 (BZ)	68	C	3.9	0.00003	0.0020
PCB 158 (BZ)	49		20		
PCB 159 (BZ)	0.97 U		20		
PCB 160 (BZ)	0.97 U		20		
PCB 161 (BZ)	0.97 U		20		
PCB 162 (BZ)	3.4	J	20		
PCB 163 (BZ)	490	C B	59		
PCB 164 (BZ)	23		20		
PCB 165 (BZ)	0.97 U		20		
PCB 166 (BZ)	73	C	39		
PCB 167 (BZ)	24		2.0	0.00003	0.00072
PCB 168 (BZ)	420	C	39		
PCB 169 (BZ)	0.97 U		2.0	0.03	0.029
PCB 170 (BZ)	67		20		
PCB 171 (BZ)	23	C J	39		
PCB 172 (BZ)	14	J	20		
PCB 173 (BZ)	23	C J	39		
PCB 174 (BZ)	28		20		
PCB 175 (BZ)	0.97 U		20		
PCB 176 (BZ)	4.1	J	20		
PCB 177 (BZ)	26		20		
PCB 178 (BZ)	14	J	20		
PCB 179 (BZ)	16	J	20		
PCB 180 (BZ)	120	C	39		
PCB 181 (BZ)	1.3	J	20		
PCB 182 (BZ)	0.97 U		20		
PCB 183 (BZ)	32		20		
PCB 184 (BZ)	0.97 U		20		
PCB 185 (BZ)	3.8	J	20		

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	0.97 U		20		
PCB 187 (BZ)	63		20		
PCB 188 (BZ)	0.97 U		20		
PCB 189 (BZ)	2.8		2.0	0.00003	0.000084
PCB 190 (BZ)	9.1	J Q	20		
PCB 191 (BZ)	2.3	J Q	20		
PCB 192 (BZ)	0.97 U		20		
PCB 193 (BZ)	120	C	39		
PCB 194 (BZ)	21		20		
PCB 195 (BZ)	7.2	J	20		
PCB 196 (BZ)	9.2	J	20		
PCB 197 (BZ)	1.0	J	20		
PCB 198 (BZ)	29	C	39		
PCB 199 (BZ)/200 (IUPAC)	2.1	J Q	20		
PCB 200 (BZ)/201 (IUPAC)	3.5	J	20		
PCB 201 (BZ)/199 (IUPAC)	29	C	39		
PCB 202 (BZ)	8.6	J	20		
PCB 203 (BZ)	21		20		
PCB 204 (BZ)	0.97 U		20		
PCB 205 (BZ)	0.97	J	20		
PCB 206 (BZ)	12	J	20		
PCB 207 (BZ)	2.0	J Q	20		
PCB 208 (BZ)	4.8	J	20		
PCB 209 (BZ)	5.0	J	20		
Monochlorobiphenyl (total)	1.8		20		
Dichlorobiphenyl (total)	17		20		
Trichlorobiphenyl (total)	130		20		
Tetrachlorobiphenyl (total)	870		20		
Pentachlorobiphenyl (total)	2600		20		
Hexachlorobiphenyl (total)	1700		20		
Heptachlorobiphenyl (total)	420		20		
Octachlorobiphenyl (total)	100		20		
Nonachlorobiphenyl (total)	18		20		
Total TEQ Concentration					0.17

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	Work Order #....:	MQN861AD	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/16/12	Analysis Date....:	02/24/12		
Prep Batch # ....:	2047107	Dilution Factor....:	0.97	Units.....:	pg/g
Initial Wgt/Vol :	10.25 g	Analyst ID....:	Grandfield S. Virginia		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	47		5.0 - 145
13C12-PCB 3	50		5.0 - 145
13C12-PCB 4	40		5.0 - 145
13C12-PCB 15	62		5.0 - 145
13C12-PCB 19	45		5.0 - 145
13C12-PCB 37	77		5.0 - 145
13C12-PCB 54	44		5.0 - 145
13C12-PCB 77	85		10 - 145
13C12-PCB 81	85		10 - 145
13C12-PCB 104	56		10 - 145
13C12-PCB 105	82		10 - 145
13C12-PCB 114	79		10 - 145
13C12-PCB 118	82		10 - 145
13C12-PCB 123	81		10 - 145
13C12-PCB 126	83		10 - 145
13C12-PCB 155	75		10 - 145
13C12-PCB 156	107	C	10 - 145
13C12-PCB 157	107	C	10 - 145
13C12-PCB 167	107		10 - 145
13C12-PCB 169	99		10 - 145
13C12-PCB 188	83		10 - 145
13C12-PCB 189	102		10 - 145
13C12-PCB 202	86		10 - 145
13C12-PCB 205	86		10 - 145
13C12-PCB 206	81		10 - 145
13C12-PCB 208	89		10 - 145
13C12-PCB 209	76		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	73	5.0 - 145
13C12-PCB 178	77	10 - 145
13C12-PCB 111	79	10 - 145

QUALIFIERS

Results and reporting limits have been adjusted for dry weight.

\\qsacsql1\QDSApps\TEQ\WHO_205_TEQ_ND_0.rpt 3/27/20

511

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 020	**Work Order #....:**	MQN861AD	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/16/12	**Analysis Date....:**	02/24/12		
Prep Batch # ....:	2047107	**Dilution Factor....:**	0.97	**Units.....:**	pg/g
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Grandfield S. Virginia		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	1	Units.....:	pg/L
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	3.0	J	200		
PCB 2 (BZ)	10 U		200		
PCB 3 (BZ)	10 U		200		
PCB 4 (BZ)	25 U		200		
PCB 5 (BZ)	10 U		200		
PCB 6 (BZ)	25 U		200		
PCB 7 (BZ)	25 U		200		
PCB 8 (BZ)	30 U		200		
PCB 9 (BZ)	25 U		200		
PCB 10 (BZ)	25 U		200		
PCB 11 (BZ)	25 U		200		
PCB 12 (BZ)	20 U		400		
PCB 13 (BZ)	20 U		400		
PCB 14 (BZ)	25 U		200		
PCB 15 (BZ)	10 U		200		
PCB 16 (BZ)	25 U	J	200		
PCB 17 (BZ)	8.0	J	200		
PCB 18 (BZ)	60 U	C J Q B	400		
PCB 19 (BZ)	10 U		200		
PCB 20 (BZ)	50	C J B	400		
PCB 21 (BZ)	14	C J	400		
PCB 22 (BZ)	11	J Q B	200		
PCB 23 (BZ)	10 U		200		
PCB 24 (BZ)	10 U		200		
PCB 25 (BZ)	10 U	J	200		
PCB 26 (BZ)	20 U	C J Q	400		
PCB 27 (BZ)	10 U		200		
PCB 28 (BZ)	50	C J B	400		
PCB 29 (BZ)	20 U	C J Q	400		
PCB 30 (BZ)	60 U	C J Q B	400		
PCB 31 (BZ)	38	J B	200		
PCB 32 (BZ)	11	J Q	200		
PCB 33 (BZ)	14	C J	400		
PCB 34 (BZ)	10 U		200		
PCB 35 (BZ)	10 U		200		
PCB 36 (BZ)	10 U		200		
PCB 37 (BZ)	10 U	J	200		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	1	Units.....:	pg/L
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	10 U		200		
PCB 39 (BZ)	10 U		200		
PCB 40 (BZ)	23	C J	400		
PCB 41 (BZ)	30 U		200		
PCB 42 (BZ)	15	J	200		
PCB 43 (BZ)	10 U		200		
PCB 44 (BZ)	150	C J B	600		
PCB 45 (BZ)	20 U		200		
PCB 46 (BZ)	10 U		200		
PCB 47 (BZ)	150	C J B	600		
PCB 48 (BZ)	10 U	J Q	200		
PCB 49 (BZ)	140	C J	400		
PCB 50 (BZ)	16	C J Q	400		
PCB 51 (BZ)	20 U	J	200		
PCB 52 (BZ)	430	B	200		
PCB 53 (BZ)	16	C J Q	400		
PCB 54 (BZ)	10 U		200		
PCB 55 (BZ)	10 U		200		
PCB 56 (BZ)	32	J	200		
PCB 57 (BZ)	10 U		200		
PCB 58 (BZ)	10 U		200		
PCB 59 (BZ)	30 U	C J	600		
PCB 60 (BZ)	19	J	200		
PCB 61 (BZ)	320	C J	800		
PCB 62 (BZ)	30 U	C J	600		
PCB 63 (BZ)	10 U	J Q	200		
PCB 64 (BZ)	49	J	200		
PCB 65 (BZ)	150	C J B	600		
PCB 66 (BZ)	140	J	200		
PCB 67 (BZ)	10 U		200		
PCB 68 (BZ)	10 U		200		
PCB 69 (BZ)	140	C J	400		
PCB 70 (BZ)	320	C J	800		
PCB 71 (BZ)	23	C J	400		
PCB 72 (BZ)	10 U		200		
PCB 73 (BZ)	10 U		200		
PCB 74 (BZ)	320	C J	800		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	1	Units.....:	pg/L
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	30 U	C J	600		
PCB 76 (BZ)	320	C J	800		
PCB 77 (BZ)	4.6	J	20	0.0001	0.00046
PCB 78 (BZ)	10 U		200		
PCB 79 (BZ)	9.8	J Q	200		
PCB 80 (BZ)	10 U		200		
PCB 81 (BZ)	10 U		20	0.0003	0.0030
PCB 82 (BZ)	16	J	200		
PCB 83 (BZ)	20 U	J	200		
PCB 84 (BZ)	83	J	200		
PCB 85 (BZ)	75	C J	600		
PCB 86 (BZ)	360	C J	1200		
PCB 87 (BZ)	360	C J	1200		
PCB 88 (BZ)	70	C J	400		
PCB 89 (BZ)	10 U		200		
PCB 90 (BZ)	860	C B	600		
PCB 91 (BZ)	70	C J	400		
PCB 92 (BZ)	150	J	200		
PCB 93 (BZ)	40 U		400		
PCB 94 (BZ)	10 U		200		
PCB 95 (BZ)	430		200		
PCB 96 (BZ)	10 U		200		
PCB 97 (BZ)	360	C J	1200		
PCB 98 (BZ)	40 U	C J Q	400		
PCB 99 (BZ)	350		200		
PCB 100 (BZ)	40 U		400		
PCB 101 (BZ)	860	C B	600		
PCB 102 (BZ)	40 U	C J Q	400		
PCB 103 (BZ)	5.3	J Q	200		
PCB 104 (BZ)	10 U		200		
PCB 105 (BZ)	150		20	0.00003	0.0045
PCB 106 (BZ)	20 U		200		
PCB 107 (BZ)/109 (IUPAC)	41	J	200		
PCB 108 (BZ)/107 (IUPAC)	60 U	C J	400		
PCB 109 (BZ)/108 (IUPAC)	360	C J	1200		
PCB 110 (BZ)	730	C B	400		
PCB 111 (BZ)	10 U		200		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	1	Units.....:	pg/L
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	10 U		200		
PCB 113 (BZ)	860	C B	600		
PCB 114 (BZ)	9.0	J	20	0.00003	0.00027
PCB 115 (BZ)	730	C B	400		
PCB 116 (BZ)	75	C J	600		
PCB 117 (BZ)	75	C J	600		
PCB 118 (BZ)	540	B	20	0.00003	0.016
PCB 119 (BZ)	360	C J	1200		
PCB 120 (BZ)	10 U		200		
PCB 121 (BZ)	10 U		200		
PCB 122 (BZ)	10 U		200		
PCB 123 (BZ)	10 U	J	20	0.00003	0.00030
PCB 124 (BZ)	22	C J	400		
PCB 125 (BZ)	360	C J	1200		
PCB 126 (BZ)	10 U		20	0.1	1.0
PCB 127 (BZ)	10 U		200		
PCB 128 (BZ)	81	C J	400		
PCB 129 (BZ)	510	C J	600		
PCB 130 (BZ)	28	J Q	200		
PCB 131 (BZ)	10 U		200		
PCB 132 (BZ)	110	J	200		
PCB 133 (BZ)	8.4	J	200		
PCB 134 (BZ)	14	C J Q	400		
PCB 135 (BZ)	110	C J	400		
PCB 136 (BZ)	43	J	200		
PCB 137 (BZ)	19	J	200		
PCB 138 (BZ)	510	C J	600		
PCB 139 (BZ)	20 U	C J	400		
PCB 140 (BZ)	20 U	C J	400		
PCB 141 (BZ)	77	J	200		
PCB 142 (BZ)	10 U		200		
PCB 143 (BZ)	14	C J Q	400		
PCB 144 (BZ)	16	J	200		
PCB 145 (BZ)	10 U		200		
PCB 146 (BZ)	60	J	200		
PCB 147 (BZ)	290	C J	400		
PCB 148 (BZ)	10 U		200		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	1	Units.....:	pg/L
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	290	C J	400		
PCB 150 (BZ)	10 U		200		
PCB 151 (BZ)	110	C J	400		
PCB 152 (BZ)	10 U		200		
PCB 153 (BZ)	390	C J	400		
PCB 154 (BZ)	10 U	J Q	200		
PCB 155 (BZ)	10 U		200		
PCB 156 (BZ)	72	C	40	0.00003	0.0022
PCB 157 (BZ)	72	C	40	0.00003	0.0022
PCB 158 (BZ)	62	J	200		
PCB 159 (BZ)	10 U		200		
PCB 160 (BZ)	10 U		200		
PCB 161 (BZ)	10 U		200		
PCB 162 (BZ)	10 U	J	200		
PCB 163 (BZ)	510	C J	600		
PCB 164 (BZ)	31	J Q	200		
PCB 165 (BZ)	10 U		200		
PCB 166 (BZ)	81	C J	400		
PCB 167 (BZ)	28		20	0.00003	0.00084
PCB 168 (BZ)	390	C J	400		
PCB 169 (BZ)	10 U		20	0.03	0.30
PCB 170 (BZ)	47	J	200		
PCB 171 (BZ)	13	C J Q	400		
PCB 172 (BZ)	5.7	J	200		
PCB 173 (BZ)	13	C J Q	400		
PCB 174 (BZ)	29	J	200		
PCB 175 (BZ)	10 U		200		
PCB 176 (BZ)	10 U	J	200		
PCB 177 (BZ)	23	J Q	200		
PCB 178 (BZ)	10 U	J Q	200		
PCB 179 (BZ)	11	J	200		
PCB 180 (BZ)	73	C J	400		
PCB 181 (BZ)	10 U		200		
PCB 182 (BZ)	10 U		200		
PCB 183 (BZ)	17	J	200		
PCB 184 (BZ)	10 U		200		
PCB 185 (BZ)	10 U	J Q	200		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	1	Units.....:	pg/L
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	10 U		200		
PCB 187 (BZ)	38	J	200		
PCB 188 (BZ)	10 U		200		
PCB 189 (BZ)	10 U	J	20	0.00003	0.00030
PCB 190 (BZ)	6.2	J	200		
PCB 191 (BZ)	10 U		200		
PCB 192 (BZ)	10 U		200		
PCB 193 (BZ)	73	C J	400		
PCB 194 (BZ)	8.3	J Q	200		
PCB 195 (BZ)	10 U	J	200		
PCB 196 (BZ)	10 U		200		
PCB 197 (BZ)	10 U		200		
PCB 198 (BZ)	13	C J	400		
PCB 199 (BZ)/200 (IUPAC)	20 U		200		
PCB 200 (BZ)/201 (IUPAC)	10 U	J Q	200		
PCB 201 (BZ)/199 (IUPAC)	13	C J	400		
PCB 202 (BZ)	10 U	J	200		
PCB 203 (BZ)	10 U	J Q	200		
PCB 204 (BZ)	10 U		200		
PCB 205 (BZ)	10 U		200		
PCB 206 (BZ)	4.7	J Q	200		
PCB 207 (BZ)	10 U		200		
PCB 208 (BZ)	10 U	J Q	200		
PCB 209 (BZ)	10 U		200		
Monochlorobiphenyl (total)	3.0		200		
Dichlorobiphenyl (total)	ND		200		0
Trichlorobiphenyl (total)	160		200		
Tetrachlorobiphenyl (total)	1400		200		
Pentachlorobiphenyl (total)	3900		200		
Hexachlorobiphenyl (total)	2000		200		
Heptachlorobiphenyl (total)	280		200		
Octachlorobiphenyl (total)	32		200		
Nonachlorobiphenyl (total)	6.5		200		
Total TEQ Concentration					1.3

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	Work Order #....:	MQN9C1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	1	Units.....:	pg/L
Initial Wgt/Vol :	995.32 mL	Analyst ID....:	Lisa L. Hernandez		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	38		5.0 - 145
13C12-PCB 3	42		5.0 - 145
13C12-PCB 4	29		5.0 - 145
13C12-PCB 15	44		5.0 - 145
13C12-PCB 19	33		5.0 - 145
13C12-PCB 37	60		5.0 - 145
13C12-PCB 54	26		5.0 - 145
13C12-PCB 77	60		10 - 145
13C12-PCB 81	58		10 - 145
13C12-PCB 104	32		10 - 145
13C12-PCB 105	60		10 - 145
13C12-PCB 114	54		10 - 145
13C12-PCB 118	56		10 - 145
13C12-PCB 123	55		10 - 145
13C12-PCB 126	59		10 - 145
13C12-PCB 155	42		10 - 145
13C12-PCB 156	77	C	10 - 145
13C12-PCB 157	77	C	10 - 145
13C12-PCB 167	74		10 - 145
13C12-PCB 169	82		10 - 145
13C12-PCB 188	42		10 - 145
13C12-PCB 189	76		10 - 145
13C12-PCB 202	50		10 - 145
13C12-PCB 205	75		10 - 145
13C12-PCB 206	70		10 - 145
13C12-PCB 208	62		10 - 145
13C12-PCB 209	67		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	82	5.0 - 145
13C12-PCB 178	67	10 - 145
13C12-PCB 111	73	10 - 145

QUALIFIERS

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-FISH

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 021	**Work Order #....:**	MQN9C1AC	**Matrix....:**	WATER
Date Sampled....:	02/06/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/15/12	**Analysis Date....:**	02/17/12		
Prep Batch # ....:	2046094	**Dilution Factor....:**	1	**Units.....:**	pg/L
Initial Wgt/Vol :	995.32 mL	**Analyst ID....:**	Lisa L. Hernandez		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	0.98	Units.....:	pg/L
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 1 (BZ)	9.8 U		200		
PCB 2 (BZ)	9.8 U		200		
PCB 3 (BZ)	9.8 U		200		
PCB 4 (BZ)	24 U		200		
PCB 5 (BZ)	9.8 U		200		
PCB 6 (BZ)	24 U		200		
PCB 7 (BZ)	24 U		200		
PCB 8 (BZ)	29 U		200		
PCB 9 (BZ)	24 U		200		
PCB 10 (BZ)	24 U		200		
PCB 11 (BZ)	40	J	200		
PCB 12 (BZ)	20 U		390		
PCB 13 (BZ)	20 U		390		
PCB 14 (BZ)	24 U		200		
PCB 15 (BZ)	9.8 U		200		
PCB 16 (BZ)	24 U		200		
PCB 17 (BZ)	4.0	J	200		
PCB 18 (BZ)	59 U	C J B	390		
PCB 19 (BZ)	9.8 U		200		
PCB 20 (BZ)	49	C J B	390		
PCB 21 (BZ)	20 U	C J Q	390		
PCB 22 (BZ)	6.8	J Q B	200		
PCB 23 (BZ)	9.8 U		200		
PCB 24 (BZ)	9.8 U		200		
PCB 25 (BZ)	9.8 U	J Q	200		
PCB 26 (BZ)	20 U	C J Q	390		
PCB 27 (BZ)	9.8 U		200		
PCB 28 (BZ)	49	C J B	390		
PCB 29 (BZ)	20 U	C J Q	390		
PCB 30 (BZ)	59 U	C J B	390		
PCB 31 (BZ)	28	J B	200		
PCB 32 (BZ)	8.2	J	200		
PCB 33 (BZ)	20 U	C J Q	390		
PCB 34 (BZ)	9.8 U		200		
PCB 35 (BZ)	9.8 U		200		
PCB 36 (BZ)	9.8 U		200		
PCB 37 (BZ)	9.8 U	J Q	200		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	0.98	Units.....:	pg/L
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 38 (BZ)	9.8 U		200		
PCB 39 (BZ)	9.8 U		200		
PCB 40 (BZ)	29 U	C J	390		
PCB 41 (BZ)	29 U		200		
PCB 42 (BZ)	9.8 U		200		
PCB 43 (BZ)	9.8 U		200		
PCB 44 (BZ)	61	C J B	590		
PCB 45 (BZ)	20 U		200		
PCB 46 (BZ)	9.8 U		200		
PCB 47 (BZ)	61	C J B	590		
PCB 48 (BZ)	9.8 U		200		
PCB 49 (BZ)	45	C J	390		
PCB 50 (BZ)	20 U	C J	390		
PCB 51 (BZ)	20 U		200		
PCB 52 (BZ)	150	J B	200		
PCB 53 (BZ)	20 U	C J	390		
PCB 54 (BZ)	9.8 U		200		
PCB 55 (BZ)	9.8 U		200		
PCB 56 (BZ)	22	J	200		
PCB 57 (BZ)	9.8 U		200		
PCB 58 (BZ)	9.8 U		200		
PCB 59 (BZ)	29 U	C J Q	590		
PCB 60 (BZ)	15	J Q	200		
PCB 61 (BZ)	200	C J	790		
PCB 62 (BZ)	29 U	C J Q	590		
PCB 63 (BZ)	9.8 U	J Q	200		
PCB 64 (BZ)	28	J	200		
PCB 65 (BZ)	61	C J B	590		
PCB 66 (BZ)	120	J	200		
PCB 67 (BZ)	9.8 U		200		
PCB 68 (BZ)	9.8 U		200		
PCB 69 (BZ)	45	C J	390		
PCB 70 (BZ)	200	C J	790		
PCB 71 (BZ)	29 U	C J	390		
PCB 72 (BZ)	9.8 U		200		
PCB 73 (BZ)	9.8 U		200		
PCB 74 (BZ)	200	C J	790		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	0.98	Units.....:	pg/L
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 75 (BZ)	29 U	C J Q	590		
PCB 76 (BZ)	200	C J	790		
PCB 77 (BZ)	9.8 U	J Q	20	0.0001	0.00098
PCB 78 (BZ)	9.8 U		200		
PCB 79 (BZ)	9.8 U		200		
PCB 80 (BZ)	9.8 U		200		
PCB 81 (BZ)	9.8 U		20	0.0003	0.0029
PCB 82 (BZ)	9.8 U		200		
PCB 83 (BZ)	20 U	J	200		
PCB 84 (BZ)	7.5	J Q	200		
PCB 85 (BZ)	42	C J Q	590		
PCB 86 (BZ)	88	C J	1200		
PCB 87 (BZ)	88	C J	1200		
PCB 88 (BZ)	17	C J	390		
PCB 89 (BZ)	9.8 U		200		
PCB 90 (BZ)	330	C J B	590		
PCB 91 (BZ)	17	C J	390		
PCB 92 (BZ)	29	J	200		
PCB 93 (BZ)	39 U		390		
PCB 94 (BZ)	9.8 U		200		
PCB 95 (BZ)	48	J	200		
PCB 96 (BZ)	9.8 U		200		
PCB 97 (BZ)	88	C J	1200		
PCB 98 (BZ)	39 U		390		
PCB 99 (BZ)	220		200		
PCB 100 (BZ)	39 U		390		
PCB 101 (BZ)	330	C J B	590		
PCB 102 (BZ)	39 U		390		
PCB 103 (BZ)	9.8 U		200		
PCB 104 (BZ)	9.8 U		200		
PCB 105 (BZ)	140		20	0.00003	0.0042
PCB 106 (BZ)	20 U		200		
PCB 107 (BZ)/109 (IUPAC)	34	J	200		
PCB 108 (BZ)/107 (IUPAC)	59 U	C J	390		
PCB 109 (BZ)/108 (IUPAC)	88	C J	1200		
PCB 110 (BZ)	310	C J B	390		
PCB 111 (BZ)	9.8 U		200		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	0.98	Units.....:	pg/L
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 112 (BZ)	9.8 U		200		
PCB 113 (BZ)	330	C J B	590		
PCB 114 (BZ)	7.6	J	20	0.00003	0.00023
PCB 115 (BZ)	310	C J B	390		
PCB 116 (BZ)	42	C J Q	590		
PCB 117 (BZ)	42	C J Q	590		
PCB 118 (BZ)	470	B	20	0.00003	0.014
PCB 119 (BZ)	88	C J	1200		
PCB 120 (BZ)	9.8 U		200		
PCB 121 (BZ)	9.8 U		200		
PCB 122 (BZ)	9.8 U		200		
PCB 123 (BZ)	9.8 U		20	0.00003	0.00029
PCB 124 (BZ)	12	C J	390		
PCB 125 (BZ)	88	C J	1200		
PCB 126 (BZ)	9.8 U		20	0.1	0.98
PCB 127 (BZ)	9.8 U		200		
PCB 128 (BZ)	34	C J	390		
PCB 129 (BZ)	310	C J	590		
PCB 130 (BZ)	7.7	J Q	200		
PCB 131 (BZ)	9.8 U		200		
PCB 132 (BZ)	9.1	J	200		
PCB 133 (BZ)	9.8 U		200		
PCB 134 (BZ)	20 U		390		
PCB 135 (BZ)	14	C J	390		
PCB 136 (BZ)	9.8 U		200		
PCB 137 (BZ)	9.8 U	J Q	200		
PCB 138 (BZ)	310	C J	590		
PCB 139 (BZ)	20 U		390		
PCB 140 (BZ)	20 U		390		
PCB 141 (BZ)	14	J Q	200		
PCB 142 (BZ)	9.8 U		200		
PCB 143 (BZ)	20 U		390		
PCB 144 (BZ)	9.8 U	J	200		
PCB 145 (BZ)	9.8 U		200		
PCB 146 (BZ)	46	J	200		
PCB 147 (BZ)	87	C J	390		
PCB 148 (BZ)	9.8 U		200		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	0.98	Units.....:	pg/L
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 149 (BZ)	87	C J	390		
PCB 150 (BZ)	9.8 U		200		
PCB 151 (BZ)	14	C J	390		
PCB 152 (BZ)	9.8 U		200		
PCB 153 (BZ)	270	C J	390		
PCB 154 (BZ)	9.8 U		200		
PCB 155 (BZ)	9.8 U		200		
PCB 156 (BZ)	52	C	39	0.00003	0.0016
PCB 157 (BZ)	52	C	39	0.00003	0.0016
PCB 158 (BZ)	34	J	200		
PCB 159 (BZ)	9.8 U		200		
PCB 160 (BZ)	9.8 U		200		
PCB 161 (BZ)	9.8 U		200		
PCB 162 (BZ)	9.8 U		200		
PCB 163 (BZ)	310	C J	590		
PCB 164 (BZ)	9.8 U	J	200		
PCB 165 (BZ)	9.8 U		200		
PCB 166 (BZ)	34	C J	390		
PCB 167 (BZ)	17	J	20	0.00003	0.00051
PCB 168 (BZ)	270	C J	390		
PCB 169 (BZ)	9.8 U		20	0.03	0.29
PCB 170 (BZ)	18	J Q	200		
PCB 171 (BZ)	20 U		390		
PCB 172 (BZ)	9.8 U		200		
PCB 173 (BZ)	20 U		390		
PCB 174 (BZ)	9.8 U		200		
PCB 175 (BZ)	9.8 U		200		
PCB 176 (BZ)	9.8 U		200		
PCB 177 (BZ)	12	J	200		
PCB 178 (BZ)	9.8 U	J	200		
PCB 179 (BZ)	9.8 U		200		
PCB 180 (BZ)	48	C J	390		
PCB 181 (BZ)	9.8 U		200		
PCB 182 (BZ)	9.8 U		200		
PCB 183 (BZ)	9.3	J Q	200		
PCB 184 (BZ)	9.8 U		200		
PCB 185 (BZ)	9.8 U		200		

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	Work Order #....:	MQN9J1AC	Matrix....:	WATER
Date Sampled....:	02/06/12	Date Received....:	02/08/12	Instrument ID....:	12D8
Prep Date....:	02/15/12	Analysis Date....:	02/17/12		
Prep Batch # ....:	2046094	Dilution Factor....:	0.98	Units....:	pg/L
Initial Wgt/Vol :	1017.84 mL	Analyst ID....:	Lisa L. Hernandez		

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
PCB 186 (BZ)	9.8 U		200		
PCB 187 (BZ)	34	J	200		
PCB 188 (BZ)	9.8 U		200		
PCB 189 (BZ)	9.8 U		20	0.00003	0.00029
PCB 190 (BZ)	9.8 U		200		
PCB 191 (BZ)	9.8 U		200		
PCB 192 (BZ)	9.8 U		200		
PCB 193 (BZ)	48	C J	390		
PCB 194 (BZ)	7.1	J	200		
PCB 195 (BZ)	9.8 U		200		
PCB 196 (BZ)	9.8 U	J	200		
PCB 197 (BZ)	9.8 U		200		
PCB 198 (BZ)	20 U	C J	390		
PCB 199 (BZ)/200 (IUPAC)	20 U		200		
PCB 200 (BZ)/201 (IUPAC)	9.8 U		200		
PCB 201 (BZ)/199 (IUPAC)	9.8 U	C J	390		
PCB 202 (BZ)	9.8 U		200		
PCB 203 (BZ)	9.8 U		200		
PCB 204 (BZ)	9.8 U		200		
PCB 205 (BZ)	9.8 U		200		
PCB 206 (BZ)	9.8 U		200		
PCB 207 (BZ)	9.8 U		200		
PCB 208 (BZ)	9.8 U		200		
PCB 209 (BZ)	9.8 U		200		
Monochlorobiphenyl (total)	ND		200		0
Dichlorobiphenyl (total)	40		200		
Trichlorobiphenyl (total)	130		200		
Tetrachlorobiphenyl (total)	660		200		
Pentachlorobiphenyl (total)	1800		200		
Hexachlorobiphenyl (total)	910		200		
Heptachlorobiphenyl (total)	130		200		
Octachlorobiphenyl (total)	20		200		
Nonachlorobiphenyl (total)	ND		200		0
Total TEQ Concentration					1.3

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	**Work Order #....:**	MQN9J1AC	**Matrix....:**	WATER
Date Sampled....:	02/06/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/15/12	**Analysis Date....:**	02/17/12		
Prep Batch # ....:	2046094	**Dilution Factor....:**	0.98	**Units.....:**	pg/L
Initial Wgt/Vol :	1017.84 mL	**Analyst ID....:**	Lisa L. Hernandez		

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C12-PCB 1	45		5.0 - 145
13C12-PCB 3	47		5.0 - 145
13C12-PCB 4	34		5.0 - 145
13C12-PCB 15	46		5.0 - 145
13C12-PCB 19	38		5.0 - 145
13C12-PCB 37	59		5.0 - 145
13C12-PCB 54	35		5.0 - 145
13C12-PCB 77	57		10 - 145
13C12-PCB 81	55		10 - 145
13C12-PCB 104	40		10 - 145
13C12-PCB 105	53		10 - 145
13C12-PCB 114	50		10 - 145
13C12-PCB 118	49		10 - 145
13C12-PCB 123	51		10 - 145
13C12-PCB 126	54		10 - 145
13C12-PCB 155	46		10 - 145
13C12-PCB 156	71	C	10 - 145
13C12-PCB 157	71	C	10 - 145
13C12-PCB 167	65		10 - 145
13C12-PCB 169	71		10 - 145
13C12-PCB 188	42		10 - 145
13C12-PCB 189	68		10 - 145
13C12-PCB 202	46		10 - 145
13C12-PCB 205	67		10 - 145
13C12-PCB 206	67		10 - 145
13C12-PCB 208	58		10 - 145
13C12-PCB 209	64		10 - 145

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C12-PCB 28	81	5.0 - 145
13C12-PCB 178	68	10 - 145
13C12-PCB 111	68	10 - 145

QUALIFIERS

CH2M Hill Inc

Sample ID: HOMOGENIZATION BLANK-CRAB

Trace Level Organic Compounds

EPA-22 1668A

Lot - Sample #....:	G2B080439 - 022	**Work Order #....:**	MQN9J1AC	**Matrix....:**	WATER
Date Sampled....:	02/06/12	**Date Received....:**	02/08/12	**Instrument ID....:**	12D8
Prep Date....:	02/15/12	**Analysis Date....:**	02/17/12		
Prep Batch # ....:	2046094	**Dilution Factor....:**	0.98	**Units.....:**	pg/L
Initial Wgt/Vol :	1017.84 mL	**Analyst ID....:**	Lisa L. Hernandez		

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.
C	Co-eluting isomer.
J	Estimated Result.
Q	Estimated maximum possible concentration (EMPC).

4512

%LIPIDS RESULTS

CH2M Hill Inc

Sample ID: VWW06-FS01-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 001	**Work Order #....:**	MQN741AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2045119	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.01 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.38	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS01P-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 002	**Work Order #....:**	MQN751AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2045119	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.54 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	**0.40**	**0.10**		**%**

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS02-0212

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 003	**Work Order #....:**	MQN761AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2045119	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.34 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.80	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS03-0212

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 004	Work Order #....:	MQN781AE	Matrix....:	BIOLOGICAL
Date Sampled....:	02/01/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/14/12	Analysis Date....:	02/29/12		
Prep Batch # ....:	2045119	Instrument ID....:	NA		
Initial Wgt/Vol :	10.12 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	5.4	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS04-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 005	**Work Order #....:**	MQN791AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2045119	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.38	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS05-0212

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 006	**Work Order #....:**	MQN8A1AC	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2045119	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	1.8	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS05P-0212

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 007	**Work Order #....:**	MQN8C1AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2045119	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.12 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	2.3	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS06-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 008	**Work Order #....:**	MQN8D1AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2045119	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.47 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	2.5	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS07-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 009	Work Order #....:	MQN8J1AE	Matrix....:	BIOLOGICAL
Date Sampled....:	01/31/12	Date Received....:	02/08/12	Dilution Factor:	1
Prep Date....:	02/14/12	Analysis Date....:	02/29/12		
Prep Batch # ....:	2045119	Instrument ID....:	NA		
Initial Wgt/Vol :	10.37 g	Analyst ID....:	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	6.7	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-FS08-0212

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 010	**Work Order #....:**	MQN8K1AC	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/14/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2045119	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.06 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	2.8	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB01-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 011	**Work Order #....:**	MQN8L1AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.16 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.37	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB01P-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 012	**Work Order #....:**	MQN8P1AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.05 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.41	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB02-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 013	**Work Order #....:**	MQN8R1AC	**Matrix.....:**	BIOLOGICAL
Date Sampled.....:	01/31/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	1
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.52 g	**Analyst ID.....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.24	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB03-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 014	**Work Order #....:**	MQN8V1AE	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.62	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB04-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 015	**Work Order #....:**	MQN8X1AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.27 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.46	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB05-0212

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 016	**Work Order #....:**	MQN811AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.22 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.42	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB05P-0212

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 017	**Work Order #....:**	MQN821AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	02/01/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.1 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.46	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB06-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 018	**Work Order #....:**	MQN831AC	**Matrix.....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received.....:**	02/08/12	**Dilution Factor:**	1
Prep Date.....:	02/16/12	**Analysis Date.....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.18 g	**Analyst ID.....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.32	0.10		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB07-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 019	**Work Order #....:**	MQN841AE	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.45 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	**0.58**	**0.10**		%

QUALIFIERS

CH2M Hill Inc

Sample ID: VWW06-CRB08-0112

Trace Level Organic Compounds

SW846 8290

Lot - Sample #....:	G2B080439 - 020	**Work Order #....:**	MQN861AC	**Matrix....:**	BIOLOGICAL
Date Sampled....:	01/31/12	**Date Received....:**	02/08/12	**Dilution Factor:**	1
Prep Date....:	02/16/12	**Analysis Date....:**	02/29/12		
Prep Batch # ....:	2047109	**Instrument ID....:**	NA		
Initial Wgt/Vol :	10.25 g	**Analyst ID....:**	Sylvia H. Krenn		

PARAMETER	RESULT	LOQ	DL	UNITS
Percent Lipids	0.42	0.10		%

QUALIFIERS

SELECT METALS WORKSHEETS

This SDG contains trace metals analysis using USEPA method 1638M with laboratory SOP modifications. The site is in Region II. However, the region does not have a validation SOP for this non-CLP method. Therefore, the validation was performed using method/SOP QC specifications and good professional judgement. Region II guidance was utilized as applicable. The worksheets provided here are a substitute for the usual Region II checklist style SOP.

A case narrative that tabulated pertinent information regarding sample receipt, condition, preservation & holding time compliance was provided by the laboratory. Specific information regarding the method and modifications was present in this narrative. Any QC issues were noted in the narrative. CLP or CLP-like forms were not present in the data package. Results were summarized on spreadsheets that were printed and submitted in the front of the data package. These summaries along with the raw data were sufficient to allow a complete review of the analytical data package.

SAMPLE RECEIPT, PRESERVATION & HOLDING TIMES

Sampling Date: 1/31/12 & 02/01/12
Received Date: 2/8/12
Prep. Dates: 2/9-10/12
Analysis Dates: 2/10-11/12

Sample shipping and receipt paperwork was in order. Cooler temperatures were acceptable. All holding time requirements were met. COC records are present, containing necessary signatures indicating change of custody between sampler and laboratory. Several sample IDs required correction based on a corrections memo from CH2M HILL. A copy of this memo is included to explain the ID changes from COC to report.

The digestion log was present in the data package. The pH value for the two homogenization blanks was <2 (created & preserved by the lab).

ICP-MS TUNING

A request for clarification of the laboratory's tuning procedures was requested as the lab did not follow the DOD requirement of Tune prior to each analytical run. Clarification was received in the form of an e-mail response stating that they were aware the DOD requirements were not followed but that their SOP requirement of a monthly tune was followed. Their system is stable as evidenced by the tunes that were supplied. . Mass calibration criteria were met for ICP-MS. No qualifications were required.

CALIBRATIONS

The proper calibration procedures were followed for the ICP-MS analysis, based on the method used by the laboratory. These samples were analyzed on several sequences. Initial calibration criteria were met for the target analytes lead, thallium and zinc. All associated ICV/CCV criteria were met for associated standards with any exceptions requiring qualifications noted in the report. The SCV check standards were analyzed and all criteria were met with exceptions noted in the report. The SCV for zinc was slightly high at 129% recovery. However the analytical data was not qualified based on this non-compliance because all ICV and CCV standards were acceptable with none tending high. See annotated calibration forms for details. Raw data was verified. Calculations were verified. All quality control criteria were verified.

INTERNAL STANDARD AREA RECOVERIES

All internal standard area recoveries were acceptable for all standards and samples associated with this SDG. No qualifications were required.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- Apply the same data validation guidelines to any associated calibration, preparation, and field QC blanks and all associated samples.
- Qualification/Action codes:

  No Action - The sample result is greater than the LOD and greater than 10 times (10X) the blank value.

  U - Region II flagging guidance was used – see report for specific details.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Action Level	Q Flag
No contamination that resulted in qualifications was noted in the associated blanks.				

The laboratory analyzed method blanks as appropriate and homogenization blanks (one for each matrix) were analyzed. Some low level Zn contamination was noted in the associated method blanks. No qualifications were required because the concentration of zinc in the field samples was above the LOQ values in all cases. The homogenization blanks (HB-Crab & HB-Fish) did not exhibit target analyte contamination.

When qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination. Negative contamination in a prep blank or CCB, if less than the analyte PQL, is qualified based on professional judgment. The associated CCBs did exhibit some positive results but there was no action required in the field samples as a result of this contamination. Field QC blank associations were made based on QC tracking provided by CH2MHILL.

MATRIX SPIKE/DUPLICATE SUMMARY/LAB SPIKES AND DUPLICATE PAIRS

The MS/MSD pairs analyzed with these samples exhibited recoveries and RPDs that were in control for spike analytes with exceptions noted in report. One pair (of sample -09) exhibited high zinc recoveries. Zinc in the native sample was qualified as J with a note to possible bias. All samples were not qualified based on this non-compliance because three other MS/MSD pairs exhibited acceptable zinc recoveries. Zinc was recovered below the lower QC limit in the MS of sample -19. However, the MSD and the associated PDS were acceptable so the samples were not qualified based on this non-compliance. All PDS recoveries were acceptable.

The analyte lead exhibited high RPDs in two of the lab dup pairs (-04 & -09) with RPDs of 36% & 68%, respectively. The laboratory notes that they believe this is due to a homogenization issue – therefore the lead results in samples -04 & -09 were qualified as estimated J. Although it is possible that other samples were affected by homogenization issues, the other two lab

duplicate pairs exhibited acceptable RPDs for the reported target analytes as did the four MS/MSD pairs. For this reason the validator did not flag all of the samples based on lab duplicate RPDs that were high for samples -04 & -09.

The LCS recoveries were acceptable for all associated spike blanks with any exceptions requiring qualifications noted in report. No qualifications were required. The CRM spikes were acceptable with the exception of lead in the dogfish liver material. This recovery was high, but qualifications were not required as all other spike recoveries for lead in associated QC samples and standards were acceptable. See lab narrative note regarding this non-compliance.

SERIAL DILUTIONS

The serial dilution analyses exhibited acceptable %Ds for all analytes with significant exceptions noted in the report as necessary. No qualifications were required.

FIELD DUPLICATE SAMPLE SUMMARY

Note: Field duplicate results are assessed based on SAP QC limits and Region II validation guidance. See following pages for results of field duplicate assessment and any qualifications necessary. Qualifications were required.

SAMPLE RESULT VERIFICATION

Specific Comments:

The SDG consisted of fish and crab tissue samples and two homogenization blanks. Sample results were verified by review of raw data & calculation verification. All sample results were reported within the calibration/linear range of the instruments. Detection limits were acceptable. Raw data was verified. The results were reported on a wet-weight basis with %total solids results reported with the metals results. No correction was applied for water weight. Also, the samples were not corrected for method blank contamination.

Several Pb results were flagged B by the laboratory to indicate that the reported results were between the LOD and the LOQ values. These results were qualified as estimated J by the validator. No qualifier code is required for this qualifier.

Clarification of the tuning procedures, digestion and calculations were requested and received from the laboratory. Copies of e-mail correspondence, etc. are included in the worksheets section of the DV report.

Reviewer J Cleveland **Date:** 4/16/12

SDG 403743, Lab # 1205028
NTR Vieques SWMU 6 Fish & Crab Sampling
CTO-113
Select Metals

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-CRB01-0112
Duplicate Sample ID: VWW06-CRB01P-0112

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	5.14	4.12	22
thallium	ND	ND	#VALUE!
zinc	21.6	20.3	6
%Solids	35.83	31.24	14

COMMENTS: No qualifications were required. RPDs were within 30% (SAP criteria)

Sample ID: VWW06-CRB05-0112
Duplicate Sample ID: VWW06-CRB05P-0112

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	0.033	0.037	11
thallium	ND	ND	#VALUE!
zinc	19	19.2	1
%Solids	34.32	37.28	8

COMMENTS: No qualifications were required. RPDs were within 30% (SAP criteria)

Sample ID: VWW06-FS01-0112
Duplicate Sample ID: VWW06-FS01P-0112

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	0.097	0.055	55
thallium	ND	ND	#VALUE!
zinc	16.9	10.8	44
%Solids	29.99	28.38	6

COMMENTS: Qualify Pb & Zn as estimated J. RPDs were outside 30% (SAP criteria)

Sample ID: VWW06-FS05-0212
Duplicate Sample ID: VWW06-FS05P-0212

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	ND	ND	#VALUE!
thallium	ND	ND	#VALUE!
zinc	11.3	10.1	11
%Solids	24.33	27.12	11

COMMENTS: No qualifications were required. RPDs were within 30% (SAP criteria)

CH2M HILL VIEQUES CTO-113 - SWMU6

METALS CALCULATIONS

Sample -Positive result

ICP-MS	
SAMPLE ID	VWW06-CRB03-0112 (-14)
ANALYTE	lead
Lab Value CONCENTRATION (mg/Kg)	2.07
AMOUNT FROM RAW DATA (ug/L)	26.2382
SAMPLE SIZE (g)	0.506
FINAL VOLUME (L)	40
DILUTION FACTOR	1
DRYNESS FACTOR	1
CONVERSION FACTOR (ug/g to mg/Kg)	0.001
CALCULATED CONCENTRATION (ug/Kg)	2.07

CH2M HILL Vieques - CTO-113, SWMU6 Reporting Limit Calcs

ICP - MS	
SAMPLE ID	VWW06-FS02-0212
ANALYTE	zinc
Form 1 LOD or LOQ Value (mg/Kg)	0.71
Analyte LOD or LOQ	0.072
Dilution Factor	10
Nominal Sample Size (g)	0.5
SAMPLE SIZE (g)	0.509
DRYNESS FACTOR	1
Corrected LOD or LOQ (mg/Kg)	0.707

Samples are reported on a wet weight basis with Total Solids reported.

Sample Information

Sample	Lab ID	Report Matrix	Type	Sampled	Received
VWW06-FS01-0112	1205028-01	Fish	Sample	01/31/2012	02/03/2012
VWW06-FS01P-0112	1205028-02	Fish	Field Duplicate	01/31/2012	02/03/2012
VWW06-FS02-0212	1205028-03	Fish	Sample	02/01/2012	02/03/2012
VWW06-FS03-0212	1205028-04	Fish	QC Sample	02/01/2012	02/03/2012
VWW06-FS04-0112	1205028-05	Fish	Sample	01/31/2012	02/03/2012
VWW06-FS05-0212	1205028-06	Fish	Sample	02/01/2012	02/03/2012
VWW06-FS05P-0212	1205028-07	Fish	Field Duplicate	02/01/2012	02/03/2012
VWW06-FS06-0112	1205028-08	Fish	Sample	01/31/2012	02/03/2012
VWW06-FS07-0112	1205028-09	Fish	QC Sample	01/31/2012	02/03/2012
VWW06-FS08-0212	1205028-10	Fish	Sample	02/01/2012	02/03/2012
VWW06-CRB01-0112	1205028-11	Crab	Sample	01/31/2012	02/03/2012
VWW06-CRB01P-0112	1205028-12	Crab	Field Duplicate	01/31/2012	02/03/2012
VWW06-CRB02-0112	1205028-13	Crab	Sample	01/31/2012	02/03/2012
VWW06-CRB03-0112	1205028-14	Crab	QC Sample	01/31/2012	02/03/2012
VWW06-CRB04-0112	1205028-15	Crab	Sample	01/31/2012	02/03/2012
VWW06-CRB05-0212	1205028-16	Crab	Sample	02/01/2012	02/03/2012
VWW06-CRB05P-0212	1205028-17	Crab	Field Duplicate	02/01/2012	02/03/2012
VWW06-CRB06-0112	1205028-18	Crab	Sample	01/31/2012	02/03/2012
VWW06-CRB07-0112	1205028-19	Crab	QC Sample	01/31/2012	02/03/2012
VWW06-CRB08-0112	1205028-20	Crab	Sample	01/31/2012	02/03/2012
HB- Fish	1205028-21	DIW	Homog Blank	02/06/2012	02/03/2012
HB- Crab	1205028-22	DIW	Homog Blank	02/06/2012	02/03/2012

Batch Summary

Analyte	Lab Matrix	Method	Prepared	Analyzed	Batch	Sequence
Pb	Biota	EPA 1638	02/09/2012	02/10/2012	B120198	1200096
Tl	Biota	EPA 1638	02/09/2012	02/10/2012	B120198	1200096
Zn	Biota	EPA 1638	02/09/2012	02/10/2012	B120198	1200096
%TS	Soil/Sediment	SM 2540G	02/15/2012	02/17/2012	B120240	N/A

Project ID: CHM-CH1201
PM: Tiffany Stilwater

BROOKS RAND LABS
MEANINGFUL METALS DATA

BRL Report 1205028, Rev.1
Client PM: Hillary Ott
Client PO: 946759

Instrument Calibration

Sequence: 1200096
Instrument: ICP-MS-2
Date: 02/10/2012
Analyte: Zn 68

Trace Metals by ICP-MS
Method: EPA 1638

Lab ID	True Value	Result	Units	REC & Limits	
1200096-ICB1		0.00	µg/L		
1200096-CAL1	0.2000	0.20	µg/L	99%	
1200096-CAL2	0.4000	0.41	µg/L	102%	
1200096-CAL3	2.000	2.03	µg/L	102%	
1200096-CAL4	5.000	5.18	µg/L	104%	
1200096-CAL5	50.00	49.52	µg/L	99%	
1200096-CAL6	250.0	250.2	µg/L	100%	
1200096-CAL7	500.0	492.2	µg/L	98%	
1200096-CAL8	1000	967.0	µg/L	97%	
1200096-ICB2		0.10	µg/L		
1200096-ICV1	5.000	5.07	µg/L	101%	90-110
1200096-ICB3		0.003	µg/L		
1200096-IBL1		0.0004	µg/L		
1200096-IBL2		-0.008	µg/L		
1200096-IBL3		-0.003	µg/L		
1200096-IBL4		-0.005	µg/L		
1200096-SCV1	78.50	101.0	µg/L	129%	75-125
1200096-IFA1	0.00001000	5.73	µg/L	N/A	N/A
1200096-IFB1	100.0	113.5	µg/L	113%	80-120
1200096-CCV1	5.000	5.16	µg/L	103%	90-110
1200096-CCB1		-0.01	µg/L		
1200096-CCV2	5.000	5.21	µg/L	104%	90-110
1200096-CCB2		0.0007	µg/L		
1200096-CCV3	5.000	5.22	µg/L	104%	90-110
1200096-CCB3		-0.01	µg/L		
1200096-CCV4	5.000	5.11	µg/L	102%	90-110
1200096-CCB4		-0.004	µg/L		
1200096-CCV5	5.000	4.90	µg/L	98%	90-110
1200096-CCB5		-0.009	µg/L		
1200096-CCV6	5.000	4.93	µg/L	99%	90-110
1200096-CCB6		0.0001	µg/L		
1200096-CCV7	50.00	48.22	µg/L	96%	90-110
1200096-CCB7		-0.01	µg/L		
1200096-CCV8	50.00	48.13	µg/L	96%	90-110
1200096-CCB8		0.05	µg/L		
1200096-CCV9	50.00	48.77	µg/L	98%	90-110
1200096-CCB9		0.04	µg/L		
1200096-CCVA	50.00	49.51	µg/L	99%	90-110
1200096-CCBA		0.05	µg/L		
1200096-CCVB	50.00	48.78	µg/L	98%	90-110
1200096-CCBB		0.02	µg/L		

NQ - all ICV/CCV OK with no high recovery tendency noted.

558

Project ID: CHM-CH1201
PM: Tiffany Stilwater

BROOKS RAND LABS
MEANINGFUL METALS DATA

BRL Report 1205028, Rev.1
Client PM: Hillary Ott
Client PO: 946759

Method Blanks & Reporting Limits

Batch: B120198
Matrix: Biota
Method: EPA 1638
Analyte: Pb

Sample	Result	Units
B120198-BLK1	-0.000006	mg/kg
B120198-BLK2	-0.002	mg/kg
B120198-BLK3	-0.002	mg/kg
B120198-BLK4	-0.002	mg/kg

DoD QSEM Limit: 0.020

MDL: 0.004
MRL: 0.040

Analyte: Tl

Sample	Result	Units
B120198-BLK1	-0.0006	mg/kg
B120198-BLK2	-0.0006	mg/kg
B120198-BLK3	-0.0006	mg/kg
B120198-BLK4	-0.0006	mg/kg

DoD QSEM Limit: 0.004

MDL: 0.002
MRL: 0.008

Analyte: Zn 68

Sample	Result	Units
B120198-BLK1	0.13	mg/kg
B120198-BLK2	0.10	mg/kg
B120198-BLK3	0.07	mg/kg
B120198-BLK4	0.07	mg/kg

DoD QSEM Limit: 0.50

MDL: 0.28
MRL: 1.00

Project ID: CHM-CH1201
PM: Tiffany Stilwater

BROOKS RAND LABS
MEANINGFUL METALS DATA

BRL Report 1205028, Rev.1
Client PM: Hillary Ott
Client PO: 946759

Accuracy & Precision Summary

spikes/spike dups LFB, CRM, SDs PDS

Batch: B120198
Lab Matrix: Biota
Method: EPA 1638

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B120198-BS1	**Laboratory Fortified Blank (1206073)**						
	Pb		0.4000	0.405	mg/kg	101% 80-120	
	Tl		0.08000	0.077	mg/kg	96% 80-120	
	Zn		20.00	17.65	mg/kg	88% 80-120	
B120198-SRM1	**Certified Reference Material (1051005, TORT-2)**						
	Pb		0.3500	0.287	mg/kg	82% 75-125	
	Zn		180.0	169.4	mg/kg	94% 75-125	
B120198-SRM2	**Certified Reference Material (1201032, DOLT-4 Dogfish Liver Certified for TM)**						
	Pb		0.1600	0.230	mg/kg	144% 75-125	NQ - note in narrative
	Zn		116.0	102.9	mg/kg	89% 75-125	
B120198-DUP1	**Duplicate (1205028-04)** Lab Dup						
	Pb	1.649		1.146	mg/kg	36% 20	J in native; homogenization issue
	Tl	ND		ND	mg/kg	N/C 20	
	Zn	15.46		17.69	mg/kg	13% 20	
B120198-DUP5	**Duplicate (1205028-04)** SD						
	Pb	1.649		1.684	mg/kg	2% 10	
	Tl	ND		ND	mg/kg	N/C 10	
	Zn	15.46		16.53	mg/kg	7% 10	
B120198-MS1	**Matrix Spike (1205028-04)**						
	Pb	1.649	0.3854	1.321	mg/kg	NR 80-120	Spike amt low
	Tl	ND	0.07707	0.075	mg/kg	98% 80-120	
	Zn	15.46	19.27	33.77	mg/kg	95% 80-120	
B120198-MSD1	**Matrix Spike Duplicate (1205028-04)**						spike amt. low
	Pb	1.649	0.3697	1.508	mg/kg	NR 80-120	13% 20
	Tl	ND	0.07394	0.071	mg/kg	96% 80-120	6% 20
	Zn	15.46	18.48	30.42	mg/kg	81% 80-120	10% 20

Project ID: CHM-CH1201
PM: Tiffany Stilwater

BROOKS RAND LABS
MEANINGFUL METALS DATA

BRL Report 1205028, Rev.1
Client PM: Hillary Ott
Client PO: 946759

Accuracy & Precision Summary

Batch: B120198
Lab Matrix: Biota
Method: EPA 1638

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B120198-PS1	**Post Spike (1205028-04)**						
	Pb	1.649	6.107	7.909	mg/kg	103% 75-125	
	Tl	ND	1.221	1.228	mg/kg	101% 75-125	
	Zn	15.46	305.3	295.7	mg/kg	92% 75-125	
B120198-DUP2	**Duplicate (1205028-09)**	Lab Dups					
	Pb	0.017		0.034	mg/kg	J in native	68% 20 homogenization issue
	Tl	ND		ND	mg/kg		N/C 20
	Zn	15.19		21.50	mg/kg		34% 20
B120198-DUP6	**Duplicate (1205028-09)**	SD					
	Pb	0.017		ND	mg/kg		N/C 10
	Tl	ND		ND	mg/kg		N/C 10
	Zn	15.19		16.31	mg/kg		7% 10
B120198-MS2	**Matrix Spike (1205028-09)**						
	Pb	0.017	0.3717	0.431	mg/kg	111% 80-120	
	Tl	ND	0.07435	0.074	mg/kg	100% 80-120	
	Zn	15.19	18.59	43.66	mg/kg	153% 80-120	
B120198-MSD2	**Matrix Spike Duplicate (1205028-09)**						
	Pb	0.017	0.3788	0.415	mg/kg	105% 80-120	4% 20
	Tl	ND	0.07576	0.076	mg/kg	100% 80-120	2% 20
	Zn	15.19	18.94	38.40	mg/kg	123% 80-120	13% 20
B120198-PS2	**Post Spike (1205028-09)**						
	Pb	0.017	6.190	6.372	mg/kg	103% 75-125	
	Tl	ND	1.238	1.239	mg/kg	100% 75-125	
	Zn	15.19	309.5	301.1	mg/kg	92% 75-125	
B120198-DUP3	**Duplicate (1205028-14)**						
	Pb	2.074		1.799	mg/kg		14% 20
	Tl	ND		ND	mg/kg		N/C 20
	Zn	26.43		23.74	mg/kg		11% 20

Flag J in (Zn) native only

3958 6th Avenue NW Seattle WA 98107 · P(206) 632-6206 · F(206) 632-6017 · brl@brooksrand.com · www.brooksrand.com

Project ID: CHM-CH1201
PM: Tiffany Stilwater

BROOKS RAND LABS
MEANINGFUL METALS DATA

BRL Report 1205028, Rev.1
Client PM: Hillary Ott
Client PO: 946759

Accuracy & Precision Summary

Batch: B120198
Lab Matrix: Biota
Method: EPA 1638

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B120198-DUP7	**Duplicate (1205028-14)** SD						
	Pb	2.074		2.073	mg/kg		0.08% 10
	Tl	ND		ND	mg/kg		N/C 10
	Zn	26.43		27.69	mg/kg		5% 10
B120198-MS3	**Matrix Spike (1205028-14)**						
	Pb	2.074	0.4057	2.517	mg/kg	NR 80-120	
	Tl	ND	0.08114	0.076	mg/kg	93% 80-120	
	Zn	26.43	20.28	44.06	mg/kg	87% 80-120	
B120198-MSD3	**Matrix Spike Duplicate (1205028-14)**						
	Pb	2.074	0.3883	2.678	mg/kg	NR 80-120	6% 20
	Tl	ND	0.07767	0.077	mg/kg	99% 80-120	2% 20
	Zn	26.43	19.42	44.61	mg/kg	94% 80-120	1% 20
B120198-PS3	**Post Spike (1205028-14)**						
	Pb	2.074	6.324	8.065	mg/kg	95% 75-125	
	Tl	ND	1.265	1.196	mg/kg	95% 75-125	
	Zn	26.43	316.2	302.1	mg/kg	87% 75-125	
B120198-DUP4	**Duplicate (1205028-19)**						
	Pb	0.066		0.067	mg/kg		1% 20
	Tl	ND		ND	mg/kg		N/C 20
	Zn	20.69		19.16	mg/kg		8% 20
B120198-DUP8	**Duplicate (1205028-19)** SD						
	Pb	0.066		0.059	mg/kg		*11%* 10 NQ - native conc ↓
	Tl	ND		ND	mg/kg		N/C 10
	Zn	20.69		22.30	mg/kg		7% 10
B120198-MS4	**Matrix Spike (1205028-19)**						
	Pb	0.066	0.3914	0.388	mg/kg	82% 80-120	
	Tl	ND	0.07828	0.070	mg/kg	89% 80-120	
	Zn	20.69	19.57	33.67	mg/kg	*66%* 80-120	MSD & POS OK no quals

Accuracy & Precision Summary

Batch: B120198
Lab Matrix: Biota
Method: EPA 1638

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B120198-MSD4	**Matrix Spike Duplicate (1205028-19)**						
	Pb	0.066	0.4000	0.463	mg/kg	99% 80-120	18% 20
	Tl	ND	0.08000	0.074	mg/kg	92% 80-120	6% 20
	Zn	20.69	20.00	37.42	mg/kg	84% 80-120	11% 20
B120198-PS4	**Post Spike (1205028-19)**						
	Pb	0.066	6.190	5.873	mg/kg	94% 75-125	
	Tl	ND	1.238	1.157	mg/kg	93% 75-125	
	Zn	20.69	309.5	286.8	mg/kg	86% 75-125	

Project ID: CHM-CH1201
PM: Tiffany Stilwater

BROOKS RAND LABS
MEANINGFUL METALS DATA

BRL Report 1205028, Rev.1
Client PM: Hillary Ott
Client PO: 946759

Accuracy & Precision Summary

Sample Dups

Batch: B120240
Lab Matrix: Soil/Sediment
Method: SM 2540G

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B120240-DUP1	**Duplicate (1205028-04)**						
	%TS	33.12		32.13	%		3% 15
B120240-DUP2	**Duplicate (1205028-09)**						
	%TS	37.66		40.47	%		7% 15
B120240-DUP3	**Duplicate (1205028-14)**						
	%TS	35.35		38.21	%		8% 15
B120240-DUP4	**Duplicate (1205028-19)**						
	%TS	33.38		31.79	%		5% 15

Jacqueline Cleveland

From: Tiffany Stilwater [Tiffany@brooksrand.com]
Sent: Thursday, April 12, 2012 1:17 PM
To: Jacqueline Cleveland
Cc: 'DataQual'; Michael.Zamboni@CH2M.com; Hillary.Ott@CH2M.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 1638M

Dear Jackie,
Good morning!!

With regards to Q #1 the answer is yes! Sample specific detection limits account for the sample size prepared & any dilution. The reported batch detection limits (seen on the method blanks section of the report) are the default volumes as outlined in our SOPs.

With regards to #2 – sample back calculations are not intuitive. I am working through a calculation and will send it on over once finished!

Tiffany

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 10, 2012 2:51 PM
To: Tiffany Stilwater
Cc: 'DataQual'; Michael.Zamboni@CH2M.com; Hillary.Ott@CH2M.com
Subject: CH2M HILL Vieques SWMU 6 Metals by 1638M
Importance: High

Hello Tiffany,

I have a couple of additional questions regarding the metals data package.

1. Are the DLs, LODs and LOQs corrected for sample size?
2. I am unable to reproduce the quantitation calculation. Please provide a sample calculation for a reported positive result. Please show me where the final volume of the digestate is taken in to consideration. I was unable to find this value on the digestion records provided.

Thanks for your help!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

Jacqueline Cleveland

From: Tiffany Stilwater [Tiffany@brooksrand.com]
Sent: Tuesday, April 10, 2012 5:00 PM
To: Jacqueline Cleveland
Cc: 'DataQual'; Michael.Zamboni@CH2M.com; Hillary.Ott@CH2M.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 1638M

Dear Jackie,
Hi! The system is stable. Our SOPs call for a monthly tuning and we have had no issues. I know DoD criteria calls for tuning prior to each sample analysis and we normally do this, so I am not sure where the communication broke down. All other DoD samples we receive are waters. I'll get back to you with regards to the other inquires.

Talk to you soon!
Tiffany

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 10, 2012 2:53 PM
To: Tiffany Stilwater
Cc: 'DataQual'; Michael.Zamboni@CH2M.com; Hillary.Ott@CH2M.com
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 1638M

Thank you Tiffany,

I am assuming that the system is very stable, so no I do not need the March 1 tune unless it was not within criteria. I sent you a couple of additional questions in another e-mail. Thanks for your quick resonse.

Jackie

From: Tiffany Stilwater [mailto:Tiffany@brooksrand.com]
Sent: Tuesday, April 10, 2012 4:43 PM
To: Jacqueline Cleveland
Subject: RE: CH2M HILL Vieques SWMU 6 Metals by 1638M

Dear Jackie,
Good afternoon! Sorry about the undeliverable email! I've forwarded this along to my IT Manager. Perhaps he can make heads/tails of it.

With regards to the tuning report, you are not overlooking a thing. I double checked with my TM lab and we did not perform a tuning report on the day of analysis. The tuning report included with the report was the soonest tuning done prior to sample analysis. The next tuning was performed on 3.1.12. Would you like this report?

Please let me know if you need anything!
Tiffany

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 10, 2012 12:37 PM
To: Tiffany Stilwater
Subject: FW: CH2M HILL Vieques SWMU 6 Metals by 1638M
Importance: High

Hi Tiffany,

The first time I sent the e-mail below it came back undeliverable. I am trying again!

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, April 10, 2012 2:31 PM
To: Tiffany Stilwater (tiffany@brooksrand.com)
Cc: 'DataQual'; 'Michael.Zamboni@CH2M.com'; 'Hillary.Ott@CH2M.com'
Subject: CH2M HILL Vieques SWMU 6 Metals by 1638M
Importance: High

Dear Tiffany,

Hello! I am validating the trace metals data that your lab analyzed for CH2M HILL recently. The Brooks Rand Labs SDG # is 1205028. I have a questions regarding the metals tune data. There is a tuning report for one tune in the data package. It was analyzed on 2/2/12 at 13:44 in the afternoon. The samples in this SDG were analyzed on 2/10-11/12 and I don't see a tune for that analysis sequence. It may be that I am overlooking the information. Please point me in the right direction or submit the tune(s) associated with the samples in this SDG. Let me know if you have any questions. Thanks!

Jackie

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC
636-352-9391
cleve137@charter.net

Calculation example
1638M - Brooks-Rand
labs -

EPA 1638, Biota*

$$(C)\frac{F}{I * 1000}$$

C – concentration of the sample preparation, corrected for the dilution at the instrument, µg/L
F – final volume of the prep, mL (40 mL)
I – aliquot of sample prepared in grams (typically ~0.5 g)
* If requested, the final result is dry weight corrected by dividing it by the percent total solids result

Example: VWW06-CRB01-0112 (1205028-11). Pb analysis Batch B12090198, Sequence 1200096. Result 5.14 mg/kg

$$(69.3569)\frac{40}{0.54*1000} = 5.138$$

C – 69.3569 µg/L (pg 217 of the report. Includes a 10x dilution)
F – final volume of the prep, mL (40 mL)
I – 0.540 g (pg 53 of the report)

Appendix E
Post-Removal Human Health Risk Assessment

Table of Contents

Section **Page**

Table of Contents ..... **iii**

Acronyms and Abbreviations ..... **v**

1 Introduction **1-1**
1.1 Overview 1-1
1.2 Scope of the Risk Assessment 1-1
1.3 Potential Receptors 1-1

2 Data Evaluation **2-1**
2.1 Data Used in the HHRA 2-1
2.1.1 Surface Soil 2-1
2.1.2 Surface Water and Sediment 2-1
2.1.3 Biota 2-2
2.2 Selection of Chemicals of Potential Concern 2-2
2.2.1 COPC Screening Levels 2-2
2.2.2 Background Comparisons 2-4
2.2.3 COPC Screening Results 2-4
2.3 Hot Spot Evaluation 2-5

3 Exposure Assessment **3-1**
3.1 Exposure Pathways Quantified 3-1
3.2 Quantification of Exposure 3-2
3.2.1 Exposure Point Concentrations 3-2
3.2.2 Exposure Factors 3-2

4 Toxicity Assessment **4-1**
4.1 Non-Carcinogenic Toxicity Values 4-1
4.2 Carcinogenic Toxicity Values 4-1
4.3 Derivation of Dermal Toxicity Values 4-1
4.4 Lead Toxicity Values 4-2

5 Risk Characterization **5-1**
5.1 Approach for Potential Non-Carcinogenic Effects 5-1
5.2 Approach for Potential Carcinogenic Effects 5-2
5.3 Approach for Potential Mutagenic Effects 5-3
5.4 Summary of Risk Estimates 5-4
5.5 Chemicals of Concern 5-6
5.5.1 Hexavalent Chromium in Surface Water 5-6
5.5.2 Thallium in Surface Water 5-6
5.5.3 4,4'-DDD and 4,4'-DDE in Fish and/or Blue Crab 5-7
5.5.4 Lead in Blue Crab 5-7
5.5.5 PCBs in Fish and Blue Crab 5-7
5.6 Uncertainty Analysis 5-7
5.6.1 Exposure Point Concentrations 5-7
5.6.2 Exposure Assumptions 5-8
5.6.3 Preliminary Remediation Goal Calculations 5-9
5.6.4 Chemicals 100% Non-Detected in a Matrix 5-9

6 References **6-1**

Attachments

E-1 RAGS Part D Tables
E-2 Figures
E-3 Tables
E-4 Selection of BSAF Values for Organic and Inorganic Chemicals
E-5 Lead Models
E-6 Fish/Crab Risk Estimates For 1 Meal/Month
E-7 Chemicals 100% Non-Detected in a Matrix
E-8 Analytical Data Used in the HHRA

Acronyms and Abbreviations

µg/day	microgram per day
µg/dL	microgram per deciliter
µg/g	microgram per gram
µg/m^3	microgram per cubic meter
ADAF	Age-Dependent Adjustment Factor
ALM	Adult Lead Methodology
ATSDR	Agency for Toxic Substances and Disease Registry
BCF	Bioconcentration Factor
BLL	Blood Lead Level
BSAF	Biota-to-sediment accumulation factor
Cal/EPA	California Environmental Protection Agency
CDI	Chronic Daily Intake
CEM	conceptual exposure model
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CSF	Cancer Slope Factor
DABS	Dermal Absorption Fraction from Soil
EC	Exposure Concentration
ELCR	Excess Lifetime Cancer Risk
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERP	Environmental Restoration Program
g/day	gram per day
GSD	geometric standard deviation
HEAST	Health Effects Assessment Summary Table
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IEUBK	Integrated Exposure Uptake Biokinetic
IRIS	Integrated Risk Information System
IUR	Inhalation Unit Risk
kg	kilogram
K_{ow}	Octanol-Water Partition Coefficient
MCL	Maximum Contaminant Level
mg	milligram
mg/kg	milligram per kilogram
mg/kg-day	milligram per kilogram per day

mg/m^3	milligram per cubic meter
MMOA	Mutagenic Mode of Action
NASD	Naval Ammunition Support Detachment
NHANES	National Health and Nutrition Examination Survey
NJDEP	New Jersey Department of Environmental Protection
NRWQC	National Recommended Water Quality Criteria
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PEF	Particulate Emission Factor
PREQB	Puerto Rico Environmental Quality Board
PPRTV	Provisional Peer-Reviewed Toxicity Value
RAGS	Risk Assessment Guidance for Superfund
RSL	Regional Screening Level
RfC	Reference Concentration
RfD	Reference Dose
RME	Reasonable Maximum Exposure
SDI	Subchronic Daily Intake
TEF	Toxicity Equivalent Factor
TEQ	Toxic Equivalent
SVOC	Semivolatile Organic compound
SWMU	Solid Waste Management Unit
UCL	Upper Confidence Limit
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compound

SECTION 1

Introduction

1.1 Overview

This human health risk assessment (HHRA) was prepared for Solid Waste Management Unit (SWMU) 6 ("the Site"), Former Naval Ammunition Support Detachment (NASD), Vieques, Puerto Rico, based on the analytical data representing post-removal conditions. The approach and assumptions used in the HHRA were presented in the Pre-interim and Interim Deliverables for the Human Health Risk Assessment at SWMU 6 (CH2M HILL, 2011a and 2011b, respectively), hereinafter referred to as the Pre-Interim and Interim Deliverable, respectively.

As presented in the HHRA protocol contained in the *Master Standard Operating Procedures, Protocols, and Plans* (CH2M HILL, 2010a), hereinafter referred to as the Vieques Master HHRA protocol, for sites in the Vieques Environmental Restoration Program (ERP), and in accordance with the U.S. Environmental Protection Agency (EPA) guidance documents, this HHRA consists of a four-step evaluation process comprised of:

- Data evaluation
- Exposure assessment
- Toxicity assessment
- Risk characterization

1.2 Scope of the Risk Assessment

The HHRA was prepared in accordance with the Pre-Interim and Interim Deliverables (and associated regulatory comments) and the Vieques Master HHRA protocol with the exception of site-specific evaluations of the fish and blue crab consumption pathways. The results of preliminary risk estimates of the fish and blue crab consumption pathways indicated risk estimates exceeding EPA acceptable levels for a few analytes. Therefore, an additional evaluation of fish and blue crab consumption pathways was performed using biota data collected from the site and a very conservative ingestion frequency of 2 meals per week. However, after the biota sampling event, it was apparent that an ingestion frequency of 2 meals per week was unrealistic for the site due to the very small population of edible-size fish and blue crab in the lagoon. The protocol is consistent with EPA Region II policy and EPA guidance, including: *Risk Assessment Guidance for Superfund (RAGS), Volume 1: Human Health Evaluation Manual, Parts A, D, E, and F* (EPA, 1989, 2001, 2004, 2009a), and *Human Health Evaluation Manual*, *Standard Default Exposure Factors* (EPA, 1991). In addition, other EPA guidance documents were used and are cited in the text and tables.

1.3 Potential Receptors

Although the site is partially fenced, there may be occasional recreational users/trespassers/visitors at the site and potential fish and blue crab consumers eating fish/blue crab caught on-site. Consistent with the Vieques Master HHRA protocol, the following potential/hypothetical receptors were evaluated in the HHRA:

- **Current/Future Recreational Users/Trespassers/Site Visitors** – children (ages 1-6), youth (ages 6-16), and adults who may use the site for recreational purposes
- **Current/Future Fish and Blue Crab Consumers** – children (ages 1-6), youth (ages 6-16), and adults who may consume fish and blue crabs caught in the SWMU 6 lagoon
- **Future Residents** - child (ages 1-6) and adult residents, assuming that the site is developed for residential use
- **Future Maintenance Workers** – workers who may be involved in grounds maintenance or landscaping activities
- **Future Industrial Workers** – indoor/outdoor workers, assuming that the site is developed as an industrial facility
- **Future Construction Workers** – workers who may be involved in construction activities

The preliminary human health conceptual exposure model (CEM) presents potential exposure media, exposure points, receptors (current and future), and exposure routes, and is provided in **Table 1 of Attachment E-1** and graphically in **Figure 1 of Attachment E-2**. Although trespassers and site visitors could access the site and be potentially exposed populations, their exposure potential and duration are considerably lower than most receptors listed above and are similar to the recreational scenario. Therefore, the recreational exposures quantified in the HHRA adequately represent potential exposures by trespassers and site visitors and quantitative risk evaluations for trespassers and site visitors are not presented separately in the HHRA. Fish and blue crab consumers may have direct contact with sediment and surface water at SWMU 6, and these exposure pathways are quantified under a recreational user/trespasser/site visitor exposure scenario. The exposure frequency and duration assumed for potential recreational users/trespassers/site visitors can be used as conservative estimates for sediment and surface water exposures by potential fish or blue crab consumers. COCs were not identified for sediment or surface water since recreational users/trespassers/site visitors risk estimates for site-related chemicals did not exceed target levels.

SECTION 2

Data Evaluation

2.1 Data Used in the HHRA

The analytical data used in the HHRA consist of surface soil, surface water, and sediment data collected during the Post-Removal Supplemental Confirmatory sampling conducted in February, 2011 (CH2M HILL, 2010b), supplemented with four historical soil samples (collected at sampling stations #VWW06-SO132, -SO136, -SO137, and -SO142) collected within site boundaries during the 2009 confirmation sampling and site restoration activities (Shaw Environmental and Infrastructure, Inc., 2010). In addition, because preliminary risk estimates for the fish/blue crab consumption scenarios (modeled using sediment and surface water concentrations measured in 2011) exceeded USEPA acceptable risk levels, analytical data generated from fish and blue crab samples collected in January/February 2012 (CH2M HILL, 2012a) were also used in the HHRA. The locations of surface soil, sediment, and surface water samples used in the HHRA are depicted in **Figures 2 through 4 of Attachment E-2**. A summary of the samples used in the HHRA and the data groupings based on exposure medium and potential exposure area are presented in **Tables 1 and Table 2 of Attachment E-3**. A complete copy of the analytical dataset for the samples used in the HHRA is presented in **Attachment E-8**.

2.1.1 Surface Soil

Soil samples were divided into two sample populations based on historical contamination sources: 1) the main disposal area and lagoon located north of Highway 200 (referred to as the "North Area" for the purpose of discussion) and 2) the small debris area on the south side of Highway 200 with historically elevated polychlorinated biphenyls (PCBs), which is referred to as the "PCB Removal Area" for the purpose of discussion. The North Area surface soil dataset consists of four surface soil samples collected from the 0-6 inch interval below the excavated waste during the 2009 sampling activities (the interval deemed best representative of potential contaminants leached or released from the debris),and two samples collected from the intermittently-inundated sediment area (that is, an intertidal area that is exposed [not covered by water] for as long as 12 hours per day and available for contact as soil during that time) during the confirmatory sampling in 2011. The PCB Removal Area soil dataset consists of two surface soil samples (0-6 inches below the removed material) collected in 2011 following the final excavation activities in this area.

Soil samples collected from the North Area in 2011 were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/PCBs, explosives, and inorganics. The two soil samples from the PCB Removal Area were analyzed for PCBs. The surface soil samples collected in 2009 were analyzed for PCBs using Method 8081A, whereas the surface soil samples collected in 2011 were analyzed for PCBs using Method 8082. Method 8082 is the preferred method for analyzing PCBs because it includes specific cleanup and quantitation procedures designed for PCB analysis (EPA, 2012).

There is some uncertainty regarding the quality and usability of the VOC data collected during the 2009 confirmation sampling; therefore, VOC data associated with soil samples collected in 2009 were excluded from the North Area soil dataset. Post-remediation soil samples collected in June 2009 were analyzed for "total chromium" (no speciation) for comparison to EPA Regional Screening Levels (RSLs) for "total chromium" available at that time. Subsequent samples (those collected in 2011) were analyzed for hexavalent chromium in addition to total chromium since the RSL for "total chromium" was eliminated from the EPA RSL table in December 2009.

2.1.2 Surface Water and Sediment

The surface water and sediment datasets used in the HHRA consist of five and seven samples, respectively, collected in February 2011 from the lagoon located in the main disposal area of SWMU 6. Samples collected below the low-tide line (i.e., below the intertidal zone) were considered as sediments for the HHRA, and samples collected within or above the intertidal zone were treated as surface soil. Two co-located surface water/sediment samples (SW/SD001 and SW/SD002) were collected north of SWMU 6 to evaluate potential offsite migration of site-related chemicals to the adjacent Kiani Lagoon lobe via tidal exchange. Review of data from these stations indicates that

detected concentrations are comparable to background levels. Therefore, the two offsite locations (SW/SD 001 and SW/SD 002) are not impacted by SWMU 6-related sources; therefore, they were appropriately excluded from the SWMU 6 HHRA dataset. Surface water and sediment samples collected from the lagoon were analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics. The surface water and sediment samples were analyzed for PCBs using Method 8082. The derivation of background levels for surface water and sediment is discussed in Section 2.2.2. and presented in **Attachment C** of the FS.

2.1.3 Biota

The biota analytical data used in the HHRA consist of four fish and four crab samples collected from the SWMU 6 lagoon. Gutted whole-body fish and whole-body crab were sampled to reflect local food preparation and cooking methods. As stated by representatives from EPA and PREQB on October 27, 2011, gutted whole-body fish and whole-body crab are occasionally used in stews and soups prepared by local residents. Gutted fish data from two snook and two mullet and whole-body blue crab data were included in the HHRA. The biota samples were analyzed for PCBs using Method 1668A. The concentrations measured in the fish and blue crab samples were used in place of modeled fish and blue crab concentrations for these analytes in the HHRA.

Congener-specific PCB data were available for the fish and blue crab samples. The congener-specific dioxin-like PCB data were converted into 2,3,7,8-TCDD toxic equivalents (TEQs) using the toxicity equivalent factors (TEFs) listed in the *EPA's Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites User's Guide* (EPA, 2012a) and as recommended by EPA (2010). The TEQs for each dioxin-like PCB congener were summed on a sample-by-sample basis and were evaluated using a lower-bound estimate and an upper-bound estimate. The upper-bound TEQ was calculated using reported non-detected congener values and the lower-bound TEQ was calculated by substituting zero for the non-detected congener values. Non-dioxin-like congener-specific PCB data were also summed on a sample-by-sample basis and were evaluated as "non-dioxin-like PCBs". The uncertainties associated with the evaluation of the PCB data are discussed in the uncertainty analysis (Section 5.6).

2.2 Selection of Chemicals of Potential Concern

The chemicals of potential concern (COPCs) are those chemicals that have the greatest potential to cause adverse human health effects if receptors come in contact with site media. COPCs were selected in accordance with the Vieques Master HHRA protocol (CH2M HILL, 2010a). Chemicals that were 100 percent non-detected in an exposure medium were not selected as COPCs for that medium/data grouping. Additionally, constituents considered essential nutrients, present at low concentrations (that is, within or slightly above naturally occurring levels), and toxic only at very high doses were not selected as COPCs. The essential nutrient constituents include calcium, magnesium, potassium, and sodium. Although iron is considered an essential nutrient and is toxic at only very high doses, iron was included in the HHRA because a screening level is available.

For samples with field duplicate analyses, the higher of the two concentrations was used when both values were detects and the lower of the two reporting limits was used when both values were non-detects. In cases where one result was detected and the other non-detected, the detected value was used.

2.2.1 COPC Screening Levels

The EPA's RSLs for Chemical Contaminants at Superfund Sites (EPA, 2012b) were used to screen site data. The maximum detected concentrations in surface soil, sediment (direct contact pathway only), and surface water (direct contact pathway only) were compared to RSLs to identify COPCs for the HHRA. The RSLs are based on a target excess lifetime cancer risk (ELCR) of 1x10-6 and a non-cancer hazard quotient (HQ) of 1. The RSLs for non-carcinogenic effects were adjusted downward by a factor of 10 to account for cumulative non-cancer effects, with the exception of lead. EPA considers lead to be a special case because of the difficulty in identifying the classic "threshold" needed to develop a reference dose (RfD). The residential soil RSL for lead (400 milligrams per kilogram [mg/kg]) and the industrial soil RSL for lead (800 mg/kg) are based on the Integrated Exposure Uptake Biokinetic (IEUBK) Model for lead in children and the Adult Lead Methodology (ALM) (EPA, 2010a and 2009b) for blood lead levels in residents and workers, respectively. Therefore, the soil RSLs for lead were not adjusted downward by a factor of 10. For mercury, the RSLs for methyl mercury were used as a conservative approach. The soil, sediment, and surface water samples used in the HHRA were analyzed for total chromium and hexavalent chromium. A

multiple-lines-of-evidence approach was used to identify the appropriate RSL for use with the "total chromium" results, as follows:

- Based on a review of the soil types and related geochemistry on Vieques Island, hexavalent chromium is not expected to be present in significant quantities (as described in attached memorandum "Chromium Speciation at SWMU 6").
- Hexavalent chromium concentrations in lagoon surface water and sediment are within background levels (see Section 2.2.2).
- Although hexavalent chromium data are not available for background soil, the maximum detected onsite total chromium concentrations in soil are less than background soil concentrations.
- There was no observed source of hexavalent chromium in the former trash piles (i.e., potential source areas) situated onsite.

In accordance with the Vieques Master HHRA protocol, the RSLs used for each receptor/sample population are indicated below:

- ***Recreational Users/Trespassers/Site Visitors*** – Concentrations detected in soil samples collected from the 0-6 inch interval and sediment samples from the on-site lagoon were compared to adjusted residential soil RSLs to evaluate direct contact with soil and sediment; surface water concentrations from the on-site lagoon were compared to tap water RSLs to evaluate direct contact with surface water.
- ***Residents*** - Concentrations detected in soil samples collected from the 0-6 inch interval were compared to adjusted residential soil RSLs.
- ***Maintenance Workers/ Industrial Workers/ Construction Workers*** – Concentrations detected in soil samples collected from the 0-6 inch interval were compared to adjusted industrial soil RSLs.

Unlike the screening values addressing direct exposures to chemicals in the typical exposure media described above, health-based screening levels are not readily available for the exposure media involved in indirect exposures through consumption of fish or blue crab. Therefore, chemicals detected in surface water and sediment (for modeling the fish and blue crab consumption pathways) were screened using both quantitative and qualitative approaches, as discussed below:

Fish Consumers/Blue Crab Consumers – Initially, surface water and sediment samples were used to select COPCs for fish and blue crab using the following screening methods:

- ***Surface water*** - Surface water data were screened against the National Recommended Water Quality Criteria (NRWQC) for consumption of organisms (EPA, 2009c). If a value was not available for consumption of organisms, the value for consumption of water and organisms was used in the screening. Additionally, if a NRWQC value was not available for an organic constituent, it was identified as a COPC (excluding polycyclic aromatic hydrocarbons [PAHs]) if its log octanol-water partition coefficient (K_{ow}) exceeded 3. If a NRWQC value was not available for an inorganic constituent, the constituent was identified as a COPC if it was considered to be bioaccumulative according to EPA's (2000a) "*Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs*."
- ***Sediment*** – Since sediment screening criteria addressing the ingestion of aquatic organisms are not available, selection of COPCs was conducted based on a constituent's potential to bioaccumulate in organisms. Similar to the approach described for surface water above, organic constituents detected in sediment were identified as COPCs (excluding PAHs) if their log K_{ow} value exceeded 3. Inorganic constituents in sediment were identified as COPCs if they were considered to be bioaccumulative according to EPA's (2000a) "*Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs*."

  PAHs detected in sediment and surface water were not identified as COPCs for the aquatic organism ingestion pathway since PAHs are readily metabolized by fish and crab and are not expected to bioaccumulate in fish or blue crab or biomagnify in the food chain. PAH concentrations have also been found to decrease with

increasing trophic level (Agency for Toxic Substances and Disease Registry [ATSDR], 1995). Therefore, PAHs are not expected to present a concern for the fish and blue crab consumption pathways.

Based on the initial risk screening using modeled concentrations from sediment and surface water, four COPCs (lead, thallium, zinc, and PCBs) were concluded to be the primary risk drivers for the fish and blue crab consumption pathways. Therefore, measured fish and blue crab concentrations of these four analytes were used in a supplemental COPC screening process. Due to the lack of appropriate screening levels for biota samples, the measured constituents were identified as COPCs if they were detected in the biota samples.

2.2.2 Background Comparisons

The maximum detected concentrations of inorganics in surface soil were compared to background soil concentrations established for soil type "Qs" on West Vieques. Of the seven inorganics identified as COPCs in soil, the maximum detected concentration of arsenic was less than its background concentration (**Tables 2.1 and 2.1a of Attachment E-1**). Additionally, the maximum detected concentrations of inorganics in the onsite lagoon surface water and sediment were compared to background surface water and sediment levels established based on the 10 co-located background surface water and sediment samples collected from three nearby lagoons (Laguna Kiani, Laguna El Pobre, and Laguna Punta Arenas) adjacent to Highway 200 to the west of SWMU 6. Of the four inorganic COPCs identified in surface water for the direct contact exposure pathways, the maximum detected onsite concentrations of two inorganics (antimony and hexavalent chromium) were less than the background surface water concentrations (**Table 2.3 of Attachment E-1**). Further, of the ten inorganic COPCs identified in sediment for the direct contact exposure pathways, the maximum detected onsite concentrations of six inorganics (aluminum, arsenic, cobalt, manganese, vanadium, and hexavalent chromium) were less than the background sediment concentrations (**Table 2.4 of Attachment E-1**). Although some inorganic chemicals were detected at concentrations less than the established background concentrations, inorganic chemicals were not eliminated as COPCs based on comparison to background for soil, surface water (direct contact pathways only), and sediment (direct contact pathways only).

Inorganic chemicals detected in sediment and surface water at concentrations less than their respective background values were eliminated as COPCs for the fish and blue crab consumption pathways. This approach was approved by EPA Region 2 and the Puerto Rico Environmental Quality Board (PREQB) during the Vieques Technical Subcommittee Meeting held on October 26, 2011. Two inorganic chemicals (iron and mercury) in surface water and three inorganic chemicals (arsenic, hexavalent chromium, and mercury) in sediment were eliminated as COPCs for the fish and blue crab consumption pathways based on the background comparison.

Constituents detected in the fish and blue crab samples collected from the SWMU 6 lagoon were compared to background values established from fish and blue crab samples collected from Laguna Punta Arenas, which is a lagoon with a similar environment to SWMU 6. Similar to the fish and blue crab data collected at the SWMU 6 lagoon, gutted fish data from two snook and two mullet and whole-body blue crab data were collected from Laguna Punta Arenas. The maximum detected concentrations for fish and blue crab were used as the representative background concentrations. The detected concentrations of lead, zinc, and PCBs in biota samples from the lagoon exceeded the background concentrations for fish and blue crab, as indicated in **Tables 2.7 and 2.8,** respectively, of **Attachment E-1**.

2.2.3 COPC Screening Results

The analytes with maximum detected concentrations exceeding screening levels were identified as COPCs for soil, surface water (direct contact pathways only), and sediment (direct contact pathways only). For consumption of aquatic organisms, COPCs were initially identified based on surface water and sediment data, using the quantitative and qualitative approaches discussed in Section 2.2.1. The COPCs identified as risk drivers for the fish and blue crab consumption pathways based on the initial COPC screening were also included in a supplemental COPC screening using measured biota concentrations. As previously discussed, inorganic chemicals detected in surface water and sediment at concentrations less than their respective background values were not identified as COPCs for the fish and blue crab consumption pathways. Results of the COPC screening process for each environmental medium and receptor group are presented in **Tables 2.1 through 2.8 of Attachment E-1** and are summarized below:

Recreational Users/Trespassers/Site Visitors:

- Seven metals (aluminum, arsenic, cobalt, iron, manganese, vanadium, and hexavalent chromium), Aroclor-1254, and two PAHs (benzo(a)pyrene and benzo(b)fluoranthene) were identified as COPCs in surface soil in the North Area for the direct contact exposure pathways (**Table 2.1 of Attachment E-1**).
- No COPCs were identified in the PCB Removal Area (**Table 2.2 of Attachment E-1**).
- Four metals (antimony, cadmium, thallium, and hexavalent chromium) were identified as COPCs in surface water for the direct contact exposure pathways (**Table 2.3 of Attachment E-1**).
- Ten metals (aluminum, antimony, arsenic, cobalt, iron, lead, manganese, thallium, vanadium, and hexavalent chromium), Aroclor-1254, and two PAHs (benzo(a)pyrene and benzo(b)fluoranthene) were identified as COPCs in sediment for the direct contact exposure pathways (**Table 2.4 of Attachment E-1**).

Residents:

- Seven metals (aluminum, arsenic, cobalt, iron, manganese, vanadium, and hexavalent chromium), Aroclor-1254, and two PAHs (benzo(a)pyrene and benzo(b)fluoranthene) were identified as COPCs in surface soil in the North Area for the direct contact exposure pathways (**Table 2.1 of Attachment E-1**).
- No COPCs were identified in the PCB Removal Area (**Table 2.2 of Attachment E-1**).

Maintenance Workers/Industrial Workers/Construction Workers:

- Arsenic was identified as a COPC in surface soil in the North Area for the direct contact exposure pathways (**Table 2.1a of Attachment E-1**).
- No COPCs were identified in the PCB Removal Area (**Table 2.2a of Attachment E-1**).

Fish Consumers/Blue Crab Consumers:

- Two metals (cadmium and thallium) in surface water were initially identified as COPCs for the fish/blue crab pathways (**Table 2.5 of Attachment E-1**).
- Seven inorganic chemicals (cadmium, chromium, copper, lead, nickel, silver, and zinc), three pesticides (4,4'-DDD, 4,4'-DDE, and 4,4'-DDT), Aroclor-1254, and one VOC (tetrachloroethene) in sediment were initially identified as COPCs for the fish/blue crab pathways (**Table 2.6 of Attachment E-1**).
- Two metals (lead and zinc) and PCBs (dioxin-like and non-dioxin-like) were identified as COPCs in fish and blue crab using the measured biota data (**Tables 2.7 and 2.8 of Attachment E-1**). Thallium was eliminated as a COPC in fish and blue crab after collection of biota data because it was not detected in the biota samples.

2.3 Hot Spot Evaluation

In the HHR**A Pre-Interim Deliverabl**e, a review of site data was conducted to determine if potential hot spots were present in exposure media that may require a separate exposure evaluation (see **Figures 2 through 4 of Attachment E-2**). The detected concentrations were compared to 10 times the adjusted industrial soil and tapwater RSLs (i.e., resulting in an HQ = 1.0 and ELCR of $1x10^{-5}$) to determine the presence (if any) of a discrete area where concentrations are considerably higher than those present in the surrounding area.

As seen in **Figure 3 of Attachment E-2**, detected concentrations of arsenic at three sediment sample locations, chromium (VI) at four sediment sample locations, and thallium at one sediment location exceeded 10 times their respective residential soil RSLs. All four of the COPCs identified in surface water (antimony, cadmium, chromium (VI), and thallium) exceeded 10 times their respective RSLs (**Figure 4 of Attachment E-2**). A graphical review of the soil, sediment, and surface water data indicates that the detected concentrations are distributed relatively evenly without any discrete area of elevated concentrations. Therefore, it was concluded that no discrete hot spots are present that warrant a separate risk evaluation.

SECTION 3

Exposure Assessment

3.1 Exposure Pathways Quantified

In accordance with the Vieques Master HHRA protocol, various potential exposure pathways were quantified in the HHRA. The potential exposure pathways quantified for each receptor group are presented below:

- Recreational Users/Trespassers/Site Visitors:
  - Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-6 inches) in the North Area were quantified for potential current and future adult, youth, and child recreational users; exposure point concentrations (EPCs) are presented in **Table 3.1 of Attachment E-1**.
  - Ingestion and dermal contact exposures to COPCs in surface water were quantified for potential current and future adult, youth, and child recreational users; EPCs are presented in **Table 3.2 of Attachment E-1**.
  - Ingestion and dermal contact exposures to COPCs in sediment were quantified for potential current and future adult, youth, and child recreational users; EPCs are presented in **Table 3.3 of Attachment E-1**.
- Residents – Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-6 inches) in the North Area were quantified for potential future adult and child residents; EPCs are presented in **Table 3.1 of Attachment E-1**.
- Maintenance Workers/Industrial Workers/Construction Workers – Ingestion, dermal contact, and inhalation exposures to the COPC in surface soil (0-6 inches) in the North Area were quantified for potential future maintenance workers, industrial workers, and construction workers; the EPCs are presented in **Table 3.1a of Attachment E-1**.
- Fish Consumers/Blue Crab Consumers – Ingestion exposures to COPCs in fish and blue crab in the lagoon were quantified for potential current and future adult, youth, and child consumers.
  - Fish and blue crab EPCs were modeled using surface water concentrations and a bioconcentration factor (BCF) for the COPCs that were not analyzed in the biota samples. Cadmium was identified as a COPC in both surface water and sediment; therefore, preference was given to the use of the biota-to-sediment accumulation factor (BSAF) and sediment concentrations over the use of the BCF and surface water concentrations, in accordance with the Vieques Master HHRA protocol. The BSAF accounts for multi-pathway fish uptake of COPCs from surface water, sediment and food items, as well as biomagnification and trophic transfer via the food chain. The surface water EPCs used to model fish and blue crab concentrations are presented in **Table 3.4 of Attachment of E-1**. The BCFs and modeled fish and blue crab EPCs are presented in **Table 3.4 Supplement A of Attachment of E-1**.
  - Fish and blue crab EPCs were modeled using sediment concentrations and a BSAF for the COPCs that were not analyzed in the biota samples. The BSAFs used to model fish and blue crab concentrations from sediment were obtained from EPA's (2008a) Biota-Sediment Accumulation Factor Data Set and the Washington Department of Ecology (1995). Several factors (e.g., level of sediment contamination used in the study, fish habitat, edible species), were taken into consideration when selecting appropriate BSAFs for the HHRA. The sediment EPCs used to model fish and blue crab concentrations are presented in **Table 3.5 of Attachment of E-1**. The BSAFs are presented in **Table 3.5 Supplement A of Attachment E-1**. The output from EPA's (2008a) Biota-Sediment Accumulation Factor Data Set and the selection of the BSAFs for organic COPCs are presented in **Tables 1 through 4 of Attachment E-4**. The selection of the BSAFs for inorganic COPCs is presented in **Table 5 of Attachment E-4**. The parameters used to model fish and blue crab EPCs in units of milligram (mg) of chemical per kilogram (kg) of fish or blue crab on a wet weight basis included: a site-specific organic carbon content in lagoon sediment (2.1 percent), the EPA's default value for percent moisture in fish (75%)(1993), the EPA's default value for fish lipid content (5%)(2000a), and the arithmetic

SECTION 3

Exposure Assessment

3.1 Exposure Pathways Quantified

In accordance with the Vieques Master HHRA protocol, various potential exposure pathways were quantified in the HHRA. The potential exposure pathways quantified for each receptor group are presented below:

- Recreational Users/Trespassers/Site Visitors:
  - Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-6 inches) in the North Area were quantified for potential current and future adult, youth, and child recreational users; exposure point concentrations (EPCs) are presented in **Table 3.1 of Attachment E-1**.
  - Ingestion and dermal contact exposures to COPCs in surface water were quantified for potential current and future adult, youth, and child recreational users; EPCs are presented in **Table 3.2 of Attachment E-1**.
  - Ingestion and dermal contact exposures to COPCs in sediment were quantified for potential current and future adult, youth, and child recreational users; EPCs are presented in **Table 3.3 of Attachment E-1**.
- Residents – Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-6 inches) in the North Area were quantified for potential future adult and child residents; EPCs are presented in **Table 3.1 of Attachment E-1**.
- Maintenance Workers/Industrial Workers/Construction Workers – Ingestion, dermal contact, and inhalation exposures to the COPC in surface soil (0-6 inches) in the North Area were quantified for potential future maintenance workers, industrial workers, and construction workers; the EPCs are presented in **Table 3.1a of Attachment E-1**.
- Fish Consumers/Blue Crab Consumers – Ingestion exposures to COPCs in fish and blue crab in the lagoon were quantified for potential current and future adult, youth, and child consumers.
  - Fish and blue crab EPCs were modeled using surface water concentrations and a bioconcentration factor (BCF) for the COPCs that were not analyzed in the biota samples. Cadmium was identified as a COPC in both surface water and sediment; therefore, preference was given to the use of the biota-to-sediment accumulation factor (BSAF) and sediment concentrations over the use of the BCF and surface water concentrations, in accordance with the Vieques Master HHRA protocol. The BSAF accounts for multi-pathway fish uptake of COPCs from surface water, sediment and food items, as well as biomagnification and trophic transfer via the food chain. The surface water EPCs used to model fish and blue crab concentrations are presented in **Table 3.4 of Attachment of E-1**. The BCFs and modeled fish and blue crab EPCs are presented in **Table 3.4 Supplement A of Attachment of E-1**.
  - Fish and blue crab EPCs were modeled using sediment concentrations and a BSAF for the COPCs that were not analyzed in the biota samples. The BSAFs used to model fish and blue crab concentrations from sediment were obtained from EPA's (2008a) Biota-Sediment Accumulation Factor Data Set and the Washington Department of Ecology (1995). Several factors (e.g., level of sediment contamination used in the study, fish habitat, edible species), were taken into consideration when selecting appropriate BSAFs for the HHRA. The sediment EPCs used to model fish and blue crab concentrations are presented in **Table 3.5 of Attachment of E-1**. The BSAFs are presented in **Table 3.5 Supplement A of Attachment E-1**. The output from EPA's (2008a) Biota-Sediment Accumulation Factor Data Set and the selection of the BSAFs for organic COPCs are presented in **Tables 1 through 4 of Attachment E-4**. The selection of the BSAFs for inorganic COPCs is presented in **Table 5 of Attachment E-4**. The parameters used to model fish and blue crab EPCs in units of milligram (mg) of chemical per kilogram (kg) of fish or blue crab on a wet weight basis included: a site-specific organic carbon content in lagoon sediment (2.1 percent), the EPA's default value for percent moisture in fish (75%)(1993), the EPA's default value for fish lipid content (5%)(2000a), and the arithmetic

mean crab lipid content (3.8%) from the USACE's BSAF database (2009). The calculation of the site-specific organic carbon content in lagoon sediment is presented in **Table 3 of Attachment E-3**. Three COPCs (nickel, silver, and tetrachloroethene) are not included in **Attachment E-4** because a default value of 1 was used as the BSAF for these COPCs.

- Measured Biota Concentrations – Measured fish and blue crab concentrations, rather than modeled concentrations, were used as EPCs for lead, zinc, and PCBs. The measured fish and blue crab EPCs are presented in **Tables 3.6 and 3.7, respectively, of Attachment E-1**.

3.2 Quantification of Exposure

To evaluate the potentially complete exposure pathways further, the magnitude, frequency, and duration of exposures were estimated and quantified. EPCs were identified and pathway-specific intakes were estimated. EPA guidance (1989) recommends selecting intake variable values for a given pathway so that the combination of all intake variable values results in an estimate of the reasonable maximum exposure (RME) for that pathway. EPA recommends using upper-bound parameter values (as opposed to average values) for exposure frequency and exposure duration. EPA guidance also recommends that the contact rate be a value representing the 95th percentile.

3.2.1 Exposure Point Concentrations

Based on the Vieques Master HHRA protocol, calculation of the upper confidence limit (UCL) of the mean concentration requires at least 8 available samples within a sample group. All the analytical data groupings have less than 8 samples; therefore, the UCL of the mean was not calculated and the maximum detected concentration was used in place of the UCL as the EPC, with the exception of lead. The arithmetic mean concentration of detected values was used as the EPC for lead. The EPCs used in the intake calculations and lead models are presented in **Tables 3.1 through 3.7 of Attachment E-1**.

3.2.2 Exposure Factors

An RME scenario was quantified for potential current and future receptors (EPA, 1989). The exposure factors used in the intake calculations are presented in **Tables 4.1 through 4.8 of Attachment E-1.** The primary references for exposure factors are standard default exposure factors presented in EPA guidance (EPA, 1989; EPA, 1991; EPA, 1997a; EPA, 2002; EPA, 2004; EPA, 2009a). For chemicals with a mutagenic mode of action (MMOA), exposure factors for specific age groups (0-<2, 2-<16, and 16-<30) are needed when calculating carcinogenic risk estimates (EPA, 2005a and 2005b). The age group-specific exposure factors are provided in **Tables 4.1 Supplement A through Table 4.8 Supplement A of Attachment E-1**, and the data used to calculate the age-adjusted exposure factors are presented in **Table 4 Supplement B of Attachment E-1**.

A site-specific particulate emission factor (PEF) was calculated for use in intake estimates for recreational users, residents, industrial workers, and maintenance workers (**Table 4 Supplement C-1 of Attachment E-1**). The PEF was calculated using Equation 4-5 and Exhibit D-2 of the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (EPA, 2002). Climate Zone 9 (based on Miami, FL) and a 0.2-acre areal extent of site contamination (based on the approximate area of soil and intermittently-inundated sediment) were used in the site-specific PEF calculations. Another site-specific PEF was calculated for use in intake estimates for construction workers (**Table 4 Supplement C-2 of Attachment E-1**). This PEF was calculated using Equations 5-5 and 5-6 of the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (EPA, 2002). It was assumed that the daily unpaved road traffic consists of three vehicles (i.e., one 2-ton car and two 20-ton trucks) generating particulates in the vicinity of a hypothetical construction worker.

In accordance with the methodology used to establish the EPA RSLs for soil (EPA, 2012a), the dermal exposure route for soil and sediment was only quantified for constituents with dermal absorption fraction from soil (DABS) values, as presented in Exhibit 3-4 of the EPA's Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment; EPA, 2004). The DABS values that were used in the HHRA are presented in **Table 4 Supplement D of Attachment E-1**.

Evaluation of the fish and blue crab consumption pathways was conducted using an agency-approved site-specific ingestion frequency of two fish or blue crab meals per week. However, based on observations made during the biota sampling event when all edible size fish/blue crabs that were present in the lagoon were caught, it became apparent that this ingestion frequency was overly conservative due to the very small number of edible-size fish and blue crab present in the lagoon (4 snook, 5 mullet, and 5 blue crab), and the physical nature of the lagoon. The area of open water in the SWMU 6 lagoon is small (0.6 acres), the water depth is shallow (1 foot average), and the current hydrologic connection to Kiani Lagoon is small (approximately 3 feet wide and 1 foot deep) and mostly filled by a dense growth of red mangroves, which are an effective, natural barrier to large fish, only allowing small, young fish or crab to pass into the SWMU 6 lagoon. Therefore, the lagoon does not support a large population of edible-size fish or blue crab. Upon entering the lagoon, a juvenile fish or crab would require an additional 6 to 12 months to reach an edible size. In the future, due to natural processes, the opening to the lagoon will become completely overgrown by mangrove roots and blocked by sedimentation, resulting in an even smaller population of edible-size fish and blue crab in the lagoon. Therefore, a more realistic site-specific ingestion frequency of one meal per month was evaluated and included in the uncertainty analysis of the HHRA.

SECTION 4

Toxicity Assessment

The following hierarchy of sources was used to obtain toxicity data for COPCs (EPA, 2003a):

- Integrated Risk Information System (IRIS) (EPA, 2012c);
- Provisional Peer-Reviewed Toxicity Values (PPRTVs) (EPA, 2006a; 2006b; 2008b; 2010b); and
- Other Peer-Reviewed Sources (e.g., Health Effects Assessment Summary Tables [HEAST] [EPA, 1997b]; California Environmental Protection Agency [Cal/EPA] Toxicity Criteria Database [Cal/EPA, 2012]; EPA's Office of Water, World Health Organization, Environmental Criteria and Assessment Office; New Jersey Department of Environmental Protection [NJDEP] chromium workgroup [NJDEP, 2009]).

Non-cancer toxicity values used in the HHRA are presented in **Tables 5.1 and 5.2 of Attachment E-1**. Cancer toxicity values for COPCs are provided in **Tables 6.1 and 6.2 of Attachment E-1.**

4.1 Non-Carcinogenic Toxicity Values

Non-carcinogenic toxicity values (oral RfDs and inhalation reference concentrations [RfCs]) were used in estimating potential adverse health effects associated with exposure to COPCs. Chronic toxicity data for potential non-carcinogenic effects of COPCs are presented in **Tables 5.1 and 5.2 of Attachment E-1**.

4.2 Carcinogenic Toxicity Values

Carcinogenic toxicity values (cancer slope factors [CSFs] and inhalation unit risks [IURs]) were used in evaluating potential carcinogenic effects associated with exposure to known, probable, or possible carcinogens having an EPA weight-of-evidence classification of A, B, or C, respectively. Two exceptions are chromium (VI) and cobalt. Chromium (VI) is not considered by EPA to have a WOE classification of A, B, or C through the oral pathway but a CSF was derived by NJDEP (2009). Cobalt does not have an EPA WOE classification, but a carcinogenic inhalation toxicity value was obtained from its PPRTV (2008b). CSFs and IURs were used to estimate upper-bound lifetime statistical probabilities of a hypothetical individual developing cancer as a result of exposure to a potential carcinogen. Toxicity data for potential carcinogenic effects for COPCs are presented in **Tables 6.1 and 6.2 of Attachment E-1**.

4.3 Derivation of Dermal Toxicity Values

Oral RfDs and CSFs were converted to dermal RfDs and CSFs using an oral-to-dermal adjustment factor. The values used for this conversion were obtained from RAGS Part E Section 4.2 and Exhibit 4-1 (EPA, 2004). Following EPA's recommendation, such a conversion was performed only when a chemical has a gastrointestinal absorption factor of less than 50%. If a chemical-specific gastrointestinal absorption factor (ABS_{GI}) was not available, gastrointestinal absorption of the chemical was assumed to be 100% and the oral RfD (or oral CSF) was used as the dermal RfD (or dermal CSF) without adjustment. If an ABS_{GI} was available, the dermal RfD was derived by multiplying the oral RfD by the ABS_{GI}:

$$RfD_d = RfD_o \times ABS_{GI}$$

Where:

RfD_d	=	Dermal reference dose (milligram per kilogram per day [mg/kg-day])
RfD_o	=	Oral reference dose (mg/kg-day)
ABS_{GI}	=	Fraction of constituent absorbed in the gastrointestinal tract (unitless)

The dermal CSF was derived by dividing the oral CSF by the ABS_{GI}:

$$CSF_d = \frac{CSF_o}{ABS_{GI}}$$

Where:

CSF_d	=	Dermal cancer slope factor $(mg/kg\text{-}day)^{-1}$
CSF_o	=	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$
ABS_{GI}	=	Fraction of constituent absorbed in the gastrointestinal tract (unitless)

The dermal RfDs are included in **Table 5.1 of Attachment E-1** and the dermal CSFs are presented in **Table 6.1 of Attachment E-1**.

4.4 Lead Toxicity Values

Lead was identified as a COPC in sediment for the direct contact exposure pathways and the fish and blue crab consumption pathways. Lead was also identified as a COPC for fish and blue crab based on the measured biota data. Therefore, potential lead exposures were evaluated for recreational users/trespassers/site visitors potentially exposed to sediment through direct contact and fish/blue crab consumers who may potentially consume fish and blue crab from the lagoon at SWMU 6. However, quantitative oral toxicity levels are not available for lead.

An interim approach to assessing risks associated with adult exposures to lead was developed by EPA's Technical Review Workgroup for Lead (EPA, 2003b) and updated in 2009 (EPA, 2009b). This methodology is a variation of the IEUBK model used to evaluate lead exposures to children. The ALM is used to evaluate risks associated with nonresidential adult exposures to lead in soil. The model focuses on estimating fetal blood lead levels (BLLs) in women exposed to lead in soil (EPA 2009b). For the fish and blue crab consumption pathways, the ALM spreadsheets provided by EPA were slightly modified as shown in the equation below to calculate BLLs:

$$PbB_{adult} = \frac{Pb \times BKSF \times IR \times AF \times EF}{AT} + PbB_{adult,0}$$

Where:

PbB_{adult} = PbB of adult consumer, geometric mean (micrograms per deciliter [µg/dL])

Pb = Lead concentration in fish or crab tissue (micrograms per gram [µg/g] or mg/kg)

BKSF = Biokinetic slope factor (µg/dL per micrograms per day [µg/day])

IR =Fish/crab ingestion rate (grams per day [g/day])

AF = Absorption fraction (unitless)

EF = Exposure frequency (days/year)

$PbB_{adult,0}$ = Baseline PbB (µg/dL)

The exposure parameters used in the ALM were the same as those used for other COPCs, including a fish/blue crab consumption rate of 227 g/day (8 oz./day), a sediment ingestion rate of 50 mg/day, and an exposure frequency of 2 days/week.

In accordance with EPA's recent recommendations, a baseline BLL of 1.0 µg/dL and geometric standard deviation (GSD) of 1.8 for U.S. women, 17–45 years of age, between the National Health and Nutrition Examination Survey (NHANES) III and 1999–2004 NHANES data were used. The model results are expressed as the predicted geometric mean BLL for adults (i.e., women of child-bearing age) and the corresponding 95th percentile fetal BLLs and the percent of the population potentially experiencing BLLs above 10 µg/dL.

The potential risks associated with child recreational users/trespassers/site visitors and child fish/blue crab consumers exposed to lead were addressed using the IEUBK Lead Model for Windows®, Version 1.1, Build 11 (EPA,

2010a). The IEUBK model was designed to provide predictions of the probability of elevated BLLs for children. This model addresses three components of environmental risk assessments: the multi-media nature of exposures to lead, lead pharmacokinetics, and significant variability in exposure and risk, through estimation of probability distributions of BLLs for children exposed to similar environmental concentrations.

When performing the IEUBK modeling for evaluation of risk associated with consumption of fish and blue crab, the "alternative dietary" option was used, assuming that 10 percent of the total meat eaten by a child was fish or crab obtained from the site. The IEUBK default total meat intake for different age groups, ranging from 29.6 g/day (zero to 11 months) to 121.0 g/day (6 to 7 years), were used in the analysis. The detailed meat intake rates for different age groups are presented in EPA's technical support document for the IEUBK Model (EPA, 1994). The arithmetic mean lead concentrations in fish/blue crab were used to evaluate potential site-specific exposures to lead in biota when running the model for the fish and blue crab consumption pathways. The exposures from other environmental media (air, soil, and water) were set at zero.

The calculation worksheets for lead and the results of the ALM and IEUBK model are presented in **Attachment E-5**.

SECTION 5

Risk Characterization

Potential human health risks are discussed separately for carcinogenic and non-carcinogenic COPCs due to the different toxicological endpoints, relevant exposure durations, and methods used to estimate risk. EPA Superfund guidance considers an acceptable site ELCR range to be within 1 to 100 in a million ($1x10^{-6}$ to $1x10^{-4}$). Generally, remedial actions are not warranted for site media with an ELCR of $1x10^{-4}$ or below, or a Hazard Index (HI) of 1.0 or less, although it may be warranted if a standard (e.g., maximum contaminant level [MCL]) is exceeded, or if other site-specific information suggests to risk managers that action is appropriate.

5.1 Approach for Potential Non-Carcinogenic Effects

The HHRA evaluated the potential for non-carcinogenic effects by comparing exposure intakes of each COPC over a specified time period (chronic and subchronic) with RfDs derived for similar exposure periods. For the inhalation exposure route, non-carcinogenic effects were evaluated by comparing the ECs of each COPC with its RfC. In EPA methodology, this ratio of exposure to toxicity is referred to as a HQ. The HQ assumes that there is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects. If the exposure level exceeds this threshold, there is the potential for non-cancer health effects to occur. The HQ is calculated as follows:

$$HQ = \frac{I}{RfD} \quad \text{or} \quad HQ = \frac{EC}{RfC}$$

Where:

HQ = Hazard quotient

I = Intake level (mg/kg-day)

RfD = Reference dose (mg/kg-day)

EC = Exposure concentration (milligram per cubic meter [mg/m^3])

RfC = Reference concentration (mg/m^3)

Intake and RfD are expressed in the same units (mg/kg-day) and represent the same exposure period (chronic or subchronic). Similarly, ECs and RfCs are expressed in the same units (mg/m^3). A HQ that exceeds 1.0 (i.e., intake exceeds the RfD or EC exceeds the RfC) indicates that there is a potential for adverse health effects associated with exposure to that COPC.

To assess the potential for non-carcinogenic health effects posed by exposure to multiple COPCs and exposure routes, an HI approach was used (EPA, 1989). This approach assumes that non-carcinogenic hazards associated with exposure to more than one COPC and exposure route are additive. Synergistic or antagonistic interactions between COPCs are not quantified. The HI may exceed 1.0 even if all of the individual HQs are less than 1.0. The HI is equal to the sum of the HQs and is calculated as follows:

$$HI = \frac{I_1}{RfD_1} + \frac{I_2}{RfD_2} + \ldots \frac{I_i}{RfD_i} + \frac{EC_1}{RfC_1} + \frac{EC_2}{RfC_2} + \ldots \frac{EC_j}{RfC_j}$$

Where:

HI = Hazard index

I = Intake level (mg/kg-day)

RfD = Reference dose (mg/kg-day)

I_i = Intake level for the "*i*"th constituent

RfD_i = Reference dose for the "*i*"th constituent

EC = Exposure concentration (mg/m^3)

RfC = Reference concentration (mg/m^3)

EC_j = Exposure concentration for the "*j*"th constituent

$RfCj_i$ = Reference concentration for the "*j*"th constituent

HIs were calculated in a phased approach. Screening HIs were calculated by summing all HQs for a receptor, and final HIs were calculated for each potential receptor by target organ (or critical effect or target system). If a final HI exceeds 1.0, there is a potential for adverse non-carcinogenic effects on that target organ/system or critical effect.

5.2 Approach for Potential Carcinogenic Effects

The potential for carcinogenic effects due to exposure to site media was evaluated by estimating the ELCR. The ELCR is the incremental increase in the probability of developing cancer during one's lifetime (as a result of exposure to site media) above the probability of developing cancer from non-site exposures.

Potential ELCRs associated with exposure to individual carcinogens were calculated using CSFs and chronic daily intakes (CDIs) or subchronic daily intakes (SDIs) for oral and dermal contact exposures and IURs and ECs for inhalation exposures. The linear low-dose equation was used to estimate the incremental probability of an individual developing cancer over a lifetime as a result of exposure to potential carcinogens. Estimated ELCRs are calculated by multiplying the intake by the CSF or EC by the IUR:

$$ELCR = I \times CSF \quad \text{or} \quad ELCR = EC \times IUR$$

Where:

ELCR = unitless probability of developing cancer

I = Intake level (mg/kg-day)

CSF = cancer slope factor $(mg/kg\text{-}day)^{-1}$

EC = exposure concentration [microgram per cubic meter ($\mu g/m^3$)]

IUR = inhalation unit risk $(\mu g/m^3)^{-1}$

The theoretical probability of developing cancer as a consequence of exposure to two or more COPCs and by two or more exposure pathways was calculated by summing the risk estimates for each COPC in the appropriate scenarios using the following equation:

$$Total\ ELCR = (I_1 \times CSF_1) + (I_2 \times CSF_2) + \ldots (I_i \times CSF_i) + (EC_1 \times IUR_1) + (EC_2 \times IUR_2) + \ldots (EC_i \times IUR_j)$$

Where:

I = Intake level (mg/kg-day)

CSF = Cancer slope factor $(mg/kg\text{-}day)^{-1}$

I_i = Intake level for the '*i*'th constituent

CSF_i = Cancer slope factor for the '*i*'th constituent

EC = Exposure concentration ($\mu g/m^3$)

IUR = Inhalation unit risk $(\mu g/m^3)^{-1}$

EC_j = Exposure concentration for the 'j'th constituent

IUR_j = Inhalation unit risk for the '*j*'th constituent

5.3 Approach for Potential Mutagenic Effects

Consistent with the Cancer Guidelines and Supplemental Guidance (EPA, 2005a and 2005b), for COPCs which act via a MMOA, ELCRs were estimated using age-dependent adjustment factors (ADAFs). Two carcinogenic PAHs (benzo[a]pyrene and benzo[b]fluoranthene) and one inorganic chemical (hexavalent chromium) are COPCs at SWMU 6 that are categorized as having a MMOA. The calculations of ELCR using ADAFs are presented in **Table 7.3 RME Supplement A of Attachment E-1** for a current/future recreational user/trespasser/site visitor scenario and in **Table 7.6 Supplement A of Attachment E-1** for a future residential scenario**.** The ELCRs for COPCs acting with a MMOA were estimated using the following equations:

- **Child Recreational User/Trespasser/Site Visitor (Soil and Sediment):**

$$ELCR = \left(I_{0-2} \times CSF \times 10 \right) + \left(I_{2-6} \times CSF \times 3 \right)$$

or

$$ELCR = \left(EC_{0-2} \times IUR \times 10 \right) + \left(EC_{2-6} \times IUR \times 3 \right)$$

Where:

I_{0-2} = Intake level for ages 0 to 2 years (mg/kg-day)

CSF = Cancer slope factor $(mg/kg\text{-}day)^{-1}$

I_{2-6} = Intake level for ages 2 to 6 years (mg/kg-day)

EC_{0-2} = Exposure concentration for ages 0 to 2 years ($\mu g/m^3$)

IUR = Inhalation unit risk $(\mu g/m^3)^{-1}$

EC_{2-6} = Exposure concentration for ages 2 to 6 years ($\mu g/m^3$)

- **Child/Adult Resident (Soil):**

$$ELCR = \left(I_{0-2} \times CSF \times 10 \right) + \left(I_{2-16} \times CSF \times 3 \right) + \left(I_{16-30} \times CSF \times 1 \right)$$

or

$$ELCR = \left(EC_{0-2} \times IUR \times 10 \right) + \left(EC_{2-16} \times IUR \times 3 \right) + \left(EC_{16-30} \times IUR \times 1 \right)$$

Where:

I_{0-2} = Intake level for ages 0 to 2 years (mg/kg-day)

CSF = Cancer slope factor $(mg/kg\text{-}day)^{-1}$

I_{2-16} = Intake level for ages 2 to 16 years (mg/kg-day)

I_{16-30} = Intake level for ages 16 to 30 years (mg/kg-day)

EC_{0-2} = Exposure concentration for ages 0 to 2 years ($\mu g/m^3$)

IUR = Inhalation unit risk $(\mu g/m^3)^{-1}$

EC_{2-16} = Exposure concentration for ages 2 to 16 years ($\mu g/m^3$)

EC_{16-30} = Exposure concentration for ages 16 to 30 years ($\mu g/m^3$)

- **Child Recreational User/Trespasser/Site Visitor (Surface Water):**

$$ELCR = \left(I_{0-2} \times CSF \times 10 \right) + \left(I_{2-6} \times CSF \times 3 \right)$$

Where:

I_{0-2} = Intake level for ages 0 to 2 years (mg/kg-day)

CSF = Cancer slope factor $(mg/kg\text{-}day)^{-1}$

I_{2-6} = Intake level for ages 2 to 6 years (mg/kg-day)

5.4 Summary of Risk Estimates

Potential exposures to soil, surface water, sediment, fish, and blue crab were quantified for the RME scenarios identified below. For the dioxin-like-PCBs identified as COPCs for the fish and blue crab consumption pathways, as a conservative approach, the risks estimated for dioxin-like PCBs (upper- bound) are used in the cumulative risk estimates discussed in this section. The estimated risks for dioxin-like PCBs (lower-bound) are discussed separately in the uncertainty analysis (Section 5.6). The calculated ELCRs and HIs are as follows:

- **Recreational Users/Trespassers/Site Visitors (Adult) – Current/Future Scenario**
  - Surface soil (ingestion, dermal contact, and inhalation); surface water (ingestion and dermal contact); sediment (ingestion and dermal contact)
  - $2x10^{-4}$ cumulative ELCR; $1x10^{-6}$ ELCR for soil; $2x10^{-4}$ ELCR for surface water (driven by hexavalent chromium); $3x10^{-6}$ ELCR for sediment (**Table 7.1**, summarized in **Table 9.1 of Attachment E-1**)
  - All target organ-specific HIs<1.0 for surface soil and sediment; one target organ-specific HI>1.0 for surface water (hair [6] due to thallium) (**Table 7.1**, summarized in **Table 9.1 of Attachment E-1**)
  - The probability of BLLs exceeding 10 µg/dL due to potential exposure to lead in sediment is < 5% (**Tables 11.1a and 11.1b of Attachment E-5**).
- **Recreational Users/Trespassers/Site Visitors (Youth) – Current/Future Scenario**
  - Surface soil (ingestion, dermal contact, and inhalation); surface water (ingestion and dermal contact); sediment (ingestion and dermal contact)
  - $3x10^{-4}$ cumulative ELCR; $1x10^{-6}$ ELCR for soil; $3x10^{-4}$ ELCR for surface water (driven by hexavalent chromium); $3x10^{-6}$ ELCR for sediment (**Table 7.2**, summarized in **Table 9.2 of Attachment E-1**)
  - All target organ-specific HIs<1.0 for surface soil and sediment; one target organ-specific HI>1.0 for surface water (hair [8] due to thallium) (**Table 7.2**, summarized in **Table 9.2 of Attachment E-1**)
- **Recreational Users/Trespassers/Site Visitors (Child) – Current/Future Scenario**
  - Surface soil (ingestion, dermal contact, and inhalation); surface water (ingestion and dermal contact); sediment (ingestion and dermal contact)
  - $5x10^{-4}$ cumulative ELCR; $7x10^{-6}$ ELCR for soil; $5x10^{-4}$ ELCR for surface water (driven by hexavalent chromium); $7x10^{-6}$ ELCR for sediment (**Table 7.3**, summarized in **Table 9.3 of Attachment E-1**)
  - All target organ-specific HIs<1.0 for surface soil and sediment; one target organ-specific HI>1.0 for surface water (hair [15] due to thallium) (**Table 7.3**, summarized in **Table 9.3 of Attachment E-1**)
  - The probability of BLLs exceeding 10 µg/dL due to potential exposure to lead in sediment is < 5% (**Tables 11.2a and 11.2b of Attachment E-5**)
- **Residents (Child/Adult) – Future Scenario**
  - Soil (ingestion, dermal contact, and inhalation)
  - Adult: All target organ-specific HIs<1.0 (**Table 7.4**, summarized in **Table 9.4 of Attachment E-1**)

- Child: All target organ-specific HIs<1.0 (**Table 7.5**, summarized in **Table 9.5 of Attachment E-1**)
- Adult/Child Aggregate: $3x10^{-5}$ cumulative ELCR (**Table 7.6**, summarized in **Table 9.6 of Attachment E-1**)

- **Maintenance Workers – Future Scenario**
  - Surface Soil (ingestion, dermal contact, and inhalation)
  - Cumulative ELCR <$1x10^{-6}$ and all target organ-specific HIs<1.0 (**Table 7.7**, summarized in **Table 9.7 of Attachment E-1**)
- **Construction Workers – Future Scenario**
  - Surface Soil (ingestion, dermal contact, and inhalation)
  - Cumulative ELCR <$1x10^{-6}$ and all target organ-specific HIs<1.0 (**Table 7.8**, summarized in **Table 9.8 of Attachment E-1**)
- **Industrial Workers – Future Scenario**
  - Surface Soil (ingestion, dermal contact, and inhalation)
  - $1x10^{-6}$ cumulative ELCR and all target organ-specific HIs<1.0. (**Table 7.9**, summarized in **Table 9.9 of Attachment E-1**)
- **Fish Consumers (Adult) – Current/Future Scenario**
  - $1x10^{-3}$ cumulative ELCR (driven by 4,4'-DDE in sediment and dioxin-like PCBs and non-dioxin-like PCBs in fish); three target organ-specific HIs>1.0 (reproduction [26] due to dioxin-like PCBs in fish, and eyes [31] and finger nails [33] due to non-dioxin-like PCBs in fish) (**Table 7.10**, summarized in **Table 9.10 of Attachment E-1)**
  - The probability of BLLs exceeding 10 µg/dL due to potential exposure to lead in fish is <5% (**Tables 11.3a and 11.3b of Attachment E-5**)
- **Fish Consumers (Youth) – Current/Future Scenario**
  - $1x10^{-3}$ cumulative ELCR (driven by 4,4'-DDE in sediment, and dioxin-like PCBs and non-dioxin-like PCBs in fish); three target organ-specific HIs>1.0 (reproduction [47] due to dioxin-like PCBs in fish and eyes [55] and finger nails [55] due to non-dioxin-like PCBs in fish) (**Table 7.11**, summarized in **Table 9.11 of Attachment E-1**)
- **Fish Consumers (Child) – Current/Future Scenario**
  - $8x10^{-4}$ cumulative ELCR (driven by 4,4'-DDE in sediment, and dioxin-like PCBs and non-dioxin-like PCBs in fish); three target organ-specific HIs>1.0 (reproduction [61] due to dioxin-like PCBs in fish, and eyes [47] and finger nails [47] due to non-dioxin-like PCBs in fish) (**Table 7.12**, summarized in **Table 9.12 of Attachment E-1**)
  - Assuming 10% of meat consumption is fish from SWMU 6, the probability of BLLs exceeding 10 µg/dL due to potential exposure to lead in fish is < 5% (**Tables 11.4a and 11.4b of Attachment E-5**)
- **Blue Crab Consumers (Adult) – Current/Future Scenario**
  - $3x10^{-4}$ cumulative ELCR (driven by 4,4'-DDD and 4,4'-DDE in sediment, and dioxin-like PCBs and non-dioxin-like PCBs in blue crab); three target organ-specific HIs>1.0 (reproduction [3] due to dioxin-like PCBs in blue crab, and eyes [3] and finger nails [3] due to non-dioxin-like PCBs in blue crab) (**Table 7.13**, summarized in **Table 9.13 of Attachment E-1)**
  - The probability of BLLs exceeding 10 µg/dL due to potential exposure to lead in blue crab is > 5% (**Tables 11.5a and 11.5b of Attachment E-5)**
- **Blue Crab Consumers (Youth) – Current/Future Scenario**
  - $2x10^{-4}$ cumulative ELCR (driven by 4,4'-DDD and 4,4'-DDE in sediment, and dioxin-like PCBs and non-dioxin-like PCBs in blue crab); three target organ-specific HIs>1.0 (reproduction [5] due to dioxin-like PCBs in blue

crab, and eyes [5] and finger nails [5] due to non-dioxin-like PCBs in blue crab) (**Table 7.14**, summarized in **Table 9.14 of Attachment E-1**)

- **Blue Crab Consumers (Child) – Current/Future Scenario**
  - $2x10^{-4}$ cumulative ELCR (driven by 4,4'-DDD and 4,4'-DDE in sediment, and dioxin-like PCBs and non-dioxin-like PCBs in blue crab); three target organ-specific HIs>1.0 (reproduction [6] due to dioxin-like PCBs in blue crab and eyes [7] and finger nails [7] due to non-dioxin-like PCBs in blue crab) (**Table 7.15,** summarized in **Table 9.15 of Attachment E-1**)
  - Assuming 10% of meat consumption is blue crab from SWMU 6, the probability of BLLs exceeding 10 µg/dL due to potential exposure to lead in blue crab is <5% (**Tables 11.6a and 11.6b of Attachment E-5**)

5.5 Chemicals of Concern

Chemicals of concern (COCs) are identified when the potential ELCR or HI for a receptor group exceeds EPA threshold values (a total ELCR of $1x10^{-4}$ or a target organ-specific HI of 1) and concentrations are site-related and above background levels. When a potential ELCR of $1x10^{-4}$ is exceeded for an exposure medium for a receptor group, the COPCs above background levels and posing an individual ELCR greater than $1x10^{-6}$ in the environmental medium responsible for the unacceptable risks are identified as COCs. When a potential target organ-specific HI exceeds 1 for an exposure medium for a receptor group, the COPCs above background levels and posing a HQ greater than 0.10 for that target organ in the environmental medium responsible for the unacceptable HI are identified as COCs. Factors such as nature of contamination source, laboratory contamination, common pesticide use (unrelated to spills, improper storage disposal or use), and the realistic size of the site fish/blue crab population were also considered when identifying COCs.

The receptors with risk estimates exceeding EPA threshold values are presented below, and the environmental medium and COPCs responsible for the unacceptable risks are indicated:

- **Recreational Users/Trespassers/Site Visitors (Adult, Youth, and Child)**
  - Surface water (driven by hexavalent chromium and thallium)
- **Fish Consumers (Adult, Youth, and Child)**
  - Fish (driven by 4,4'-DDE, dioxin-like PCBs, and non-dioxin-like PCBs)
- Blue Crab Consumers (Adult, Youth, and Child)
  - Blue crab (driven by 4,4'-DDD, 4,4'-DDE, dioxin-like PCBs, and non-dioxin-like PCBs [in all three age groups], and lead (adult consumers only)

5.5.1 Hexavalent Chromium in Surface Water

As indicated in Section 2.2.2, the maximum detected onsite surface water concentration of hexavalent chromium was less than the background surface water concentration. Based on this, the presence of hexavalent chromium in SWMU 6 surface water is attributable to background; therefore, hexavalent chromium was not identified as a COC.

5.5.2 Thallium in Surface Water

Thallium in surface water is not likely site-related and is not identified as a COC for the following reasons:

- It was detected in only one of five surface water samples (location VWW06-SW003, at the northern end of the lagoon) and one of seven sediment samples (location VWW06-SD005, at the southeastern end of the lagoon). Thallium was not detected in soil or biota. If thallium was site-related, it would likely be detected in multiple soil, sediment, and surface water samples.
- Over the exposure duration, human receptors would be exposed to more concentrations than the maximum detected concentration and would pass through other, lower concentrations in the lagoon to access location VWW06-SW003.
- Thallium was not identified as a COC in other media at SWMU 6.

- The total uncertainty factor associated with the oral RfD is 3000 (10 for interspecies extrapolation, 10 for intraspecies extrapolation, 3 for extrapolation from a subchronic to chronic study, and 10 for database deficiencies). Due to the use of multiple uncertainty factors, the RfD for thallium likely results in a conservative estimate of potential non-carcinogenic hazards.

5.5.3 4,4'-DDD and 4,4'-DDE in Fish and/or Blue Crab

Pesticides in sediment (used to model fish concentrations) are present as a result of application to soil to control pests. The concentrations of pesticides detected in SWMU 6 media are consistent with concentrations detected across multiple sites on West Vieques (see Appendix X of the SWMU 4 RI/FS Report and Appendix I of this FS Report) and attributed to normal pesticide application (CH2M HILL, 2012b). The concentrations of pesticides detected in SWMU 6 media are consistent with concentrations detected across multiple sites on West Vieques (as presented in Appendix X of the RI/FS for SWMU 4) and attributed to normal pesticide application (CH2M HILL, 2012b

5.5.4 Lead in Blue Crab

The blue crab consumption frequency (2 meals/week from SWMU 6) used in the HHRA yielded risk estimates above target levels for adult blue crab consumers. However, this exposure frequency was concluded to be unrealistic due to the scarcity of edible-size fish and blue crabs in the lagoon, as observed during the biota sampling activities in January/February 2012. An exposure frequency of 1 meal/month is considered more representative of site conditions and a more realistic, sustainable ingestion rate for the lagoon. Based on this more realistic exposure assumption, the probability of BLL exceeding 10 µg/dL due to potential exposure to lead in blue crab is less than 5% (**Tables 11.9a and 11.9b of Attachment E-5**). Therefore, lead was not identified as a COC in blue crab. As previously discussed in Section 3.2.2, an ingestion frequency of 2 meals per week was considered to be overly conservative due to the very small number of edible-size fish and blue crab in the lagoon and the physical nature of the lagoon. Additionally, if fish or blue crab consumers attempted to fish or crab at the SWMU 6 lagoon more than once a month, they would likely be unsuccessful in catching fish or crab and go elsewhere, such as adjacent Kiani Lagoon. Kiani Lagoon is a larger water body that supports more and larger fish, providing more opportunities for repeated successful fishing.

5.5.5 PCBs in Fish and Blue Crab

PCBs in fish and blue crab were identified as COCs at SWMU 6 (**Tables 10.10 through 10.14 of Attachment E-1**).

5.6 Uncertainty Analysis

The assumptions used in the HHRA have inherent uncertainty. While it is theoretically possible that this leads to underestimates of potential risk, the use of numerous upper-bound assumptions most likely results in conservative estimates of potential risk. A receptor group's potential exposure and subsequent potential risk are influenced by the exposure scenario and dose/response and vary on a case-by-case basis. The key assumptions in the HHRA and their influence on the numerical risk estimates are presented in **Table 5-1**. Additionally, specific uncertainties associated with the HHRA for SWMU 6 are discussed below.

5.6.1 Exposure Point Concentrations

In this HHRA, several conservative approaches were taken to compute EPCs with the intention of yielding health-protective risk estimates. For example, the maximum detected concentration of each COPC in a sample population was selected as the EPC (with the exception of lead) because there were less than eight samples in each sample population. Using the maximum detected concentration as the EPC will likely lead to an overestimation of actual exposure because receptors are assumed to be exposed to the maximum detected concentration for the entire exposure duration.

The upper-bound estimates of TEQs based on reported non-detected concentrations (rather than lower-bound estimates calculated by substituting zero for non-detected congeners) were used to conservatively estimate risks associated with dioxin-like PCBs. The risk estimates based on the lower-bound estimates of TEQs for dioxin-like PCBs are presented in the **Table 4 series of Attachment E-3**. Although the difference between the lower-bound and

upper-bound risk estimates were low (less than 2%) for blue crab, there was approximately a 10% reduction in estimated risks when the lower-bound TEQ estimates of dioxin-like PCBs were used for the fish consumption scenarios.

5.6.2 Exposure Assumptions

In accordance with EPA guidance and the Vieques Master HHRA protocol (CH2M HILL, 2010a), exposure estimates were calculated for a RME scenario. A RME scenario results in upper-bound exposure estimates and likely overestimates actual site exposures. For example, recreational receptors are assumed to dermally contact surface water in the lagoon over their total body surface area for 4 hours each time they are present onsite. Actual contact with surface water is unlikely to occur over such a large skin surface area for this time period due to the shallow depth of the SWMU 6 lagoon (the average depth measurement recorded during a field event in February 2011 was 0.92 feet). Additionally, a 6-foot high chain linked fence with signage was installed at SWMU 6, thereby making access to the site difficult for current potential receptors. Therefore, the exposure intensity assumptions used in this HHRA are expected to be very conservative. Any actual risks are likely to be less than the potential risks presented in this HHRA.

A site-specific exposure frequency of two fish or blue crab meals per week was initially identified prior to the biota sampling event, and was used in the HHRA to estimate potential risks associated with consumption of fish and blue crab caught from the lagoon. As discussed in Section 3.3, an ingestion frequency of two meals per week was considered to be overly conservative due to the very small number of edible-size fish and blue crab present in the lagoon after the biota sampling event in January/February 2012 indicated a scarcity of edible-size fish and blue crabs and due the physical nature of the lagoon. If fish or blue crab consumers attempted to fish or crab at the SWMU 6 lagoon more than once a month, they would likely be unsuccessful in catching fish or crab and go elsewhere, such as adjacent Kiani Lagoon, which provides more opportunities for repeated successful fishing. Therefore, an exposure frequency of one meal per month is considered more representative of site conditions and a more sustainable ingestion rate over the assumed exposure duration.

The Table 7 series of Attachment E-6 presents risk estimates for PCBs based on the more realistic exposure frequency of one fish or blue crab meal per month. As indicated, one blue crab meal/month from SWMU 6 yields ELCRs and HIs within EPA acceptable levels for adult, youth, and child consumers; however, one fish meal/month from SWMU 6 yields HIs exceeding the EPA acceptable level for adult, youth, and child consumers. **Table 11.9 of Attachment E-5** presents results of the ALM model based on the more realistic exposure frequency of one blue crab meal per month; the probability of BLL exceeding 10 µg/dL due to potential exposure to lead in blue crab is less than 5% (**Tables 11.9a and 119b of Attachment E-5**). The ALM was not re-run for a more realistic consumption rate of one fish meal/month from SWMU 6 since the overly-conservative consumption rate of 2 meals/week already yielded BLLs below EPA's threshold level.

Table 5 of Attachment E-3 also presents fish and blue crab consumption frequencies corresponding to a target ELCR of $1x10^{-4}$ and non-cancer HQ of 1. As shown, the lowest fish and blue crab consumption frequencies are 1 meal/year and 15 meals/year, respectively, for a child consumer based on non-cancer effects.

The "alternative dietary" option in the IEUBK model was used to evaluate potential BLLs from to lead in fish and blue crab. In this HHRA, it was assumed that 10 percent of the total meat eaten by a child was fish or blue crab obtained from the site. This assumption is expected to be appropriately conservative for the site due to the very limited edible-size fish and blue crab population in the lagoon. However, there is uncertainty associated with the fraction obtained from the lagoon because individual intake can vary. To evaluate the sensitivity of the IEUBK model to the percentage of meat intake from SWMU 6, the IEUBK model was run using 25 percent of fish or blue crab meat caught from SWMU 6 The calculation worksheets for lead and the results of the IEUBK model are presented in **Attachment E-5**. As indicated, using the assumption that 25% of a child's meat intake is blue crab from SMWU 6 yields BLLs above EPA's threshold level. However, the assumption of 25% meat intake from the site is expected to be overly-conservative due to the very limited number of edible-size fish and blue crab in the SWMU 6 lagoon.

5.6.3 Preliminary Remediation Goal Calculations

As discussed in Section 5.4 of the FS, a sediment preliminary remediation goal (PRG) was calculated for PCBs for the protection of human health at SWMU 6. Consistent with standard approaches for calculating BSAFs, the maximum calculated BSAF was not used to represent the site (EPA, 2006). Rather, the median fish BSAF was selected to best represent the environmental setting over the exposure duration, to avoid one outlier PCB concentration in one fish sample (VWW06-FS03-0212) from dominating the BSAF, and because it was higher than the median crab BSAF. The final sediment PRG for total non-dioxin-like PCBs using the median BSAF was 0.2 mg/kg. The PRG based on the maximum BSAF of 4.01 was 0.02 mg/kg and the PRG based on the average BSAF of 1.23 was 0.1 mg/kg. The PRGs calculated using the median and average BSAFs are similar; however, the PRG calculated using the maximum BSAF is an order of magnitude lower than the PRG calculated using the median BSAF. A receptor is unlikely to be exposed to the maximum BSAF observed in this one fish sample over a chronic exposure duration. The PRG derived using the median BSAF provides a better representation of the longer-term environmental setting at the SWMU 6 lagoon and the actual exposures likely to occur through fish and crab consumption under a chronic duration.

5.6.4 Chemicals 100% Non-Detected in a Matrix

For chemicals that were 100 percent non-detected in surface soil, sediment, or surface water, the maximum non-detected values were compared to the respective EPA RSLs. The surface soil results were compared to adjusted residential and industrial soil RSLs, the sediment results were compared to adjusted residential soil RSLs, and the surface water results were compared to adjusted tapwater RSLs. The screening comparison is provided in **Attachment E-7** and the results are discussed below for each medium:

- Surface Soil - Three pesticides (aldrin, dieldrin, and toxaphene), three SVOCs [bis(2-chloroethyl)ether, n-nitroso-di-n-propylamine, and pentachlorophenol], one PAH [dibenz(a,h)anthracene], and one metal (thallium) exceeded their respective RSLs in surface soil in the North Area.
- Sediment – One VOC (1,2-dibromo-3-chloropropane) and one PAH [dibenz(a,h)anthracene] exceeded their respective RSLs in sediment.
- Surface Water – Twelve VOCs, four pesticides, five PAHs, two PCBs, and nine metals exceeded their respective RSLs in surface water.

Although the maximum detection limits of some chemicals in soil, sediment, or surface water samples exceed their respective RSLs, this is expected to have little impact on the overall risk conclusions because detected chemicals from the same analytical groups and media were not identified as COCs. Therefore, it is unlikely that the non-detected chemicals would be identified as COCs in the HHRA. Additionally, if they were to be present at the site, they are likely co-located with elevated concentrations of chemicals from the same analytical group that were identified as COPCs in the HHRA.

TABLE 5-1
Uncertainties In The Human Health Risk Assessment

Category	Methodology	Probable Effect on Site-Related Risk Estimates
DATA EVALUATION		
Surrogate chemicals in COPC screening	When tabulated RSLs were not available, RSLs for conservatively identified surrogate chemicals were used	Likely overestimates
Background comparison	Background values were not used to eliminate chemicals as COPCs in the screening process for the direct contact exposure pathways	Likely overestimates
EXPOSURE ASSESSMENT		
Exposure scenarios and pathways	Assumed that the site is developed for residential use in the future.	Overestimates
Fish/blue crab consumption frequency	Assumed 2 fish or blue crab meals from the site per week	Overestimates
Use of maximum detected concentrations as EPCs	Receptors are assumed to be exposed to the maximum detected concentration for the entire exposure duration.	Likely overestimates
Modeled fish and crab concentrations	Most fish and crab EPCs were modeled from measured sediment or surface water concentrations using BSAFs or BCFs, respectively, which are not derived from site-specific data.	May under- or overestimate
TOXICITY ASSESSMENT		
Missing toxicity values	Oral and inhalation non-cancer toxicity values are missing for some COPCs (e.g., 4,4'-DDD, 4,4'-DDE, and PAHs)	May underestimate
Uncertainty in available toxicity values, especially cobalt and thallium	Uncertainty factors for cobalt and thallium are 3,000	Likely overestimates
RISK CHARACTERIZATION		
Risk from multiple chemicals	Assumes additivity of risks from multiple chemicals; chemical mixtures may actually have synergistic or antagonistic effects.	May under- or overestimate
Combination of several upper-bound assumptions	Various upper-bound exposure and toxicity assumptions are combined.	Overestimates.

SECTION 6

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological Profile for Polycyclic Aromatic Hydrocarbons. U.S. Department of Health and Human Services. Public Health Services. August.

ATSDR. 2006. *Health Consultation. Land Crab Evaluation (National Oceanographic Atmospheric Administration Data). Isla de Vieques Vieques, Puerto Rico. EPA Facility ID: PRN000204694.* February 22.

California EPA (Cal/EPA). 2012. *Toxicity Criteria Database*. Office of Environmental Health Hazard Assessment. [Online]. Available: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp.

CH2M HILL. 2010a. *Master Standard Operating Procedures, Protocols, and Plans*, Environmental Restoration Program, Vieques, Puerto Rico. February.

CH2M HILL. 2010b. *Final Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Solid Waste Management Unit (SWMU) 6 Former Naval Ammunition Support Detachment,* Vieques, Puerto Rico. December.

CH2M HILL. 2011a. Human *Health Risk Assessment Pre-Interim Deliverable for SWMU 6* (RAGS Part D Tables 1 through 3). June.

CH2M HILL. 2011b. *Interim Deliverable for the Human Health Risk Assessment – RAGS Part D Tables – SWMU 6, Vieques, Puerto Rico.* October.

CH2M HILL. 2012a. *Final Post-Removal Supplemental Confirmatory Sampling and Analysis Plan Addendum Solid Waste Management Unit (SWMU) 6*. January.

CH2M HILL 2012b. *Final Remedial Investigation/Feasibility Study Report Solid Waste Management Unit (SWMU 4), Former Naval Ammunition Support Detachment, Vieques, Puerto Rico*. May

New Jersey Department of Environmental Protection (NJDEP). 2009. *Derivation of Ingestion-Based Soil Remediation Criterion for Cr+6 Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate.* Risk Assessment Subgroup of the NJDEP Chromium Workgroup. April.

Shaw, 2010. *Final Completion Report, Removal Actions SWMU 6, SWMU 7, AOC J, and AOC R, Former Naval Ammunitions Support Detachment, Vieques, Puerto Rico*. March.

U.S. Army Corps of Engineers (USACE). 2009. BSAF Database. Available online: http://el.erdc.usace.army.mil/bsafnew/bsaf.html.

U.S. Environmental Protection Agency (EPA). 1989. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A).* Office of Emergency and Remedial Response. EPA/540/1-89/002. December.

EPA. 1991. *Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors.* Interim Final. OSWER Directive 9285.6-03.

EPA. 1993. *Wildlife Exposure Factors Handbook*. Volume I of II. EPA/600/R-93/187a.

EPA. 1994. *Technical Support Document for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (v0.99d)***.** December.

EPA. 1997a. *Exposure Factors Handbook.* Office of Research and Development. EPA/600/P-95/002F. August.

EPA. 1997b. Health *Effects Assessment Summary Tables, Annual Update (HEAST). EPA, Environmental Criterion Assessment Office, Office of Research and Development*, Cincinnati, OH.

EPA. 2000a. *Bioaccumulation testing and interpretation for the purpose of sediment quality assessment - status and needs*. EPA/823/R-00/001.

EPA. 2000b. *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories*. Volume 2 Risk Assessment and Fish Consumption Limits. Third Edition. EPA-823-B-00-008.

EPA. 2001. *Risk Assessment Guidance for Superfund (RAGS); Volume I - Human Health Evaluation Manual* (Part D, Standardized Planning, Reporting and Review of Superfund Risk Assessments). Final. December.

EPA. 2002. *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.* Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.

EPA. 2003a. *Human Health Toxicity Values in Superfund Risk Assessments.* OSWER Directive 9285.7-53. December 5.

EPA. 2003b. *Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposure to Lead in Soil*. Office of Solid Waste and Emergency Response. OSWER 9285.7-54. January.

EPA. 2004. *Risk Assessment Guidance for Superfund, Volume I: HHEM (Part E, Supplemental Guidance for Dermal Risk Assessment).* Final. EPA/540/R-99/005. July.

EPA, 2005a. *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens.* Risk Assessment Forum. EPA/630/R-03/003F. March.

EPA,2005b. *Guidelines for Carcinogen Risk Assessment*. Risk Assessment Forum. EPA/630/P-03/001F. March.

EPA 2006. *Estimation of Biota Sediment Accumulation Factor (BSAF) From Paired Observations of Chemical Concentrations in Biota and Sediment.* EPA/600/R-06/047. May.

EPA. 2006a. *Provisional Peer Reviewed Toxicity Information for Iron (CASRN 7439-89-6) and Compounds Derivation of Subchronic and Chronic Oral RfDs*. Superfund Health Risk Technical Support Center. National Center for Environmental Assessment. September 11.

EPA. 2006b. *Provisional Peer Reviewed Toxicity Values for Aluminum (CASRN 7429-90-5). Superfund Health Risk Technical Support Center*. National Center for Environmental Assessment. October 23.

EPA. 2008a. Biota-Sediment Accumulation Factor Data Set, Version 1.0. Prepared for the U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Mid-Continent Ecology Division (MED), Duluth, Minnesota. Prepared Computer Sciences Corporation Duluth, Minnesota Contract 68-W-02-032, Task 5003 and 5004. January 2008. http://www.epa.gov/med/Prods_Pubs/bsaf.htm

EPA. 2008b. *Provisional Peer Reviewed Toxicity Values for Cobalt (CASRN 7440-48-4).* Superfund Health Risk Technical Support Center. National Center for Environmental Assessment. August 25.

EPA. 2009a. *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment).* EPA-540-R-070-002. OSWER 9285.7.82. January.

EPA. 2009b. *Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters .* Office of Solid Waste and Emergency Response. June.

EPA. 2009c. *National Recommended Water Quality Criteria*. U.S. Environmental Protection Agency, Office of Science and Technology, Office of Water, Washington, DC 20460.

EPA. 2010a. *Integrated Exposure Uptake Biokinetic Model for Lead in Children, Windows version (IEUBK win v1.1 build 11).* http://epa.gov/superfund/lead/products.htm#user. February.

EPA. 2010b. *Provisional Peer Reviewed Toxicity Values for Thallium and Compounds Metallic Thallium (7440-28-0), Thallium (I) acetate (563-68-8), Thallium (I) carbonate (6533-73-9), Thallium (I) chloride (7791-12-0), Thallium (I) nitrate (10102-45-1), Thallium (I) oxide (1314-12-1), Thallium (III) oxide (1314-32-5), Thallium (I) selenite (12039-52-0), and Thallium (I) sulfate (7446-18-6).* Superfund Health Risk Technical Support Center. National Center for Environmental Assessment. October 8.

EPA. 2012a. *Regional Screening Levels for Chemical Contaminants at Superfund Sites User's Guide*. [Online]. Available: http://www.epa.gov/region09/waste/sfund/prg/index.html. May.

EPA. 2012b. *Regional Screening Levels for Chemical Contaminants at Superfund Sites*. [Online]. Available: http://www.epa.gov/region09/waste/sfund/prg/index.html. May.

EPA. 2012c. *Integrated Risk Information System (IRIS) Database*. [Online]. Available: http://www.epa.gov/iris/index.html.

Washington Department of Ecology (WDE). 1995. *Bioaccumulation Factor Approach Analysis for Metals and Polar Organic Compounds*. October.

Attachment E-1
RAGS Part D Tables

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age (1)	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Surface Soil (0-6 inches) (2)	Surface Soil (0-6 inches) (2)	Recreational User/ Trespasser/ Site Visitor (3)	Adult/Youth/Child	Dermal	On-site	Quant	Recreational Users/Trespassers/Site Visitors may contact surface soil while visiting the site.
						Ingestion	On-site	Quant	
		Ambient Air	Emissions from Surface Soil	Recreational User/ Trespasser/ Site Visitor (3)	Adult/Youth/Child	Inhalation	On-site	Quant	Recreational Users/Trespassers/Site Visitors may inhale dust from surface soil while visiting the site.
	Surface Water	Surface Water	Surface Water	Recreational User/ Trespasser/ Site Visitor (3)	Adult/Youth/Child	Dermal	On-site	Quant	Recreational Users/Trespassers may contact surface water while wading in the lagoon.
						Ingestion	On-site	Quant	
	Sediment	Sediment	Sediment	Recreational User/ Trespasser/ Site Visitor (3)	Adult/Youth/Child	Dermal	On-site	Quant	Recreational Users/Trespassers may contact sediment while wading in the lagoon.
						Ingestion	On-site	Quant	
	Sediment/ Surface Water	Fish	Lagoon	Fish Consumer	Adult/Youth/Child	Ingestion	On-site	Quant	Fish consumers could be exposed to site contaminants bioaccumulated in fish caught in the lagoon.
		Blue Crab	Lagoon	Blue Crab Consumer	Adult/Youth/Child	Ingestion	On-site	Quant	Crab consumers could be exposed to site contaminants bioaccumulated in blue crab caught in the lagoon.
Future	Soil	Surface Soil (0-6 inches) (2)	Surface Soil (0-6 inches) (2)	Residential	Adult/Child	Dermal	On-site	Quant	The site will not be developed for residential use; however, the residential scenario is included to evaluate unrestricted land use.
						Ingestion	On-site	Quant	
				Maintenance Worker	Adult	Dermal	On-site	Quant	Based on likely occupational duties, it is assumed that maintenance workers may come in contact with surface soil.
						Ingestion	On-site	Quant	
				Industrial Worker	Adult	Dermal	On-site	Quant	The site will not be developed for industrial use; however, Industrial workers were assumed to contact soil while performing occupational duties at the site.
						Ingestion	On-site	Quant	
				Construction Worker	Adult	Dermal	On-site	Quant	Construction workers may contact soil while performing activities at the site.
						Ingestion	On-site	Quant	
		Ambient Air	Emissions from Surface Soil	Residential	Adult/Child	Inhalation	On-site	Quant	The site will not be developed for residential use; however, the residential scenario is included to evaluate unrestricted land use.
				Maintenance Worker	Adult	Inhalation	On-site	Quant	Based on likely occupational duties, it is assumed that maintenance workers may inhale dust from surface soil.
				Industrial Worker	Adult	Inhalation	On-site	Quant	The site will not be developed for industrial use; however, Industrial workers were assumed to inhale dust from soil.
				Construction Worker	Adult	Inhalation	On-site	Quant	Construction workers may inhale dust from soil while performing activities at the site.

Notes:

(1) The age group for a child is 1-6 and the age group for youth is 6-16 years old.

(2) Surface soil in the North Area and the PCB Removal Area is evaluated separately. The North Area surface soil data group includes surface soil and intermittently-inundated sediment.

(3) Recreational user scenario is used as an adequate representation of the trespasser and site visitor scenarios.

Quant: Quantitative

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
North Area Surface Soil (0 - 6 inches)	7429-90-5	Aluminum	2.12E+03 J	1.62E+04	mg/kg	VWW06-SO136	6 / 6	1.10E+00 - 1.69E+01	1.62E+04	1.10E+04	7.70E+03	nc	NA	NA	YES	ASL
	7440-36-0	Antimony	1.20E+00 J	2.10E+00 J	mg/kg	VWW06-SO132	3 / 6	2.26E-01 - 1.70E+01	2.10E+00	1.00E+00	3.10E+00	nc	NA	NA	NO	BSL
	7440-38-2	Arsenic	4.80E-01 J	1.80E+00	mg/kg	VWW06-SO132	6 / 6	2.30E-01 - 1.00E+00	1.80E+00	2.10E+00	3.90E-01	ca	NA	NA	YES	ASL
	7440-39-3	Barium	1.03E+01 J	5.87E+01	mg/kg	VWW06-SO142	6 / 6	5.30E-01 - 1.42E+00	5.87E+01	2.40E+01	1.50E+03	nc	NA	NA	NO	BSL
	7440-41-7	Beryllium	1.30E-01 J	3.20E-01 J	mg/kg	VWW06-SO142	3 / 6	1.10E-01 - 1.42E+00	3.20E-01	4.10E-01	1.60E+01	nc	NA	NA	NO	BSL
	7440-43-9	Cadmium	1.20E-01 J	7.90E-01	mg/kg	VWW06-SO132	5 / 6	5.60E-02 - 4.45E-01	7.90E-01	4.00E-02	7.00E+00	nc	NA	NA	NO	BSL
	7440-70-2	Calcium	4.18E+03	1.24E+05	mg/kg	VWW06-SO137	6 / 6	5.30E+00 - 2.94E+01	1.24E+05	2.10E+05	NUT	--	NA	NA	NO	NUT
	7440-47-3	Chromium	3.30E+00 J	2.46E+01	mg/kg	VWW06-SO136	6 / 6	8.50E-02 - 1.30E-01	2.46E+01	4.80E+01	1.20E+04	nc	NA	NA	NO	BSL
	7440-48-4	Cobalt	9.25E-01 J	1.65E+01	mg/kg	VWW06-SO136	6 / 6	4.40E-02 - 4.45E-01	1.65E+01	1.30E+01	2.30E+00	nc	NA	NA	YES	ASL
	7440-50-8	Copper	5.08E+00 J	7.20E+01 J	mg/kg	VWW06-SD011	6 / 6	1.10E-01 - 1.42E+00	7.20E+01	3.50E+01	3.10E+02	nc	NA	NA	NO	BSL
	7439-89-6	Iron	3.31E+03 J	3.22E+04	mg/kg	VWW06-SO136	6 / 6	1.50E+00 - 5.34E+00	3.22E+04	1.80E+04	5.50E+03	nc	NA	NA	YES	ASL
	7439-92-1	Lead	4.00E+00 J	1.45E+02	mg/kg	VWW06-SO132	6 / 6	2.90E-01 - 3.02E+00	1.45E+02	6.90E+00	4.00E+02	lEUBK	NA	NA	NO	BSL
	7439-95-4	Magnesium	3.08E+03	1.15E+04	mg/kg	VWW06-SO136	6 / 6	5.30E+00 - 2.58E+01	1.15E+04	1.10E+04	NUT	--	NA	NA	NO	NUT
	7439-96-5	Manganese	7.56E+01	9.61E+02	mg/kg	VWW06-SO142	6 / 6	3.50E-02 - 1.42E+00	9.61E+02	3.60E+02	1.80E+02	nc	NA	NA	YES	ASL
	7439-97-6	Mercury	7.42E-03 J	3.50E-02 J	mg/kg	VWW06-SO132	5 / 6	2.48E-03 - 9.30E-02	3.50E-02	1.60E-02	7.80E-01	nc	NA	NA	NO	BSL
	7440-02-0	Nickel	3.56E+00 J	1.81E+01	mg/kg	VWW06-SO142	5 / 6	1.70E-01 - 1.42E+00	1.81E+01	2.60E+01	1.50E+02	nc	NA	NA	NO	BSL
	7440-09-7	Potassium	6.40E+02	2.80E+03	mg/kg	VWW06-SO142	6 / 6	5.30E+00 - 4.45E+01	2.80E+03	1.70E+03	NUT	--	NA	NA	NO	NUT
	7782-49-2	Selenium	2.40E+00 J	4.40E+00 J	mg/kg	VWW06-SO137	2 / 6	1.30E-01 - 1.10E+01	4.40E+00	6.80E-01	3.90E+01	nc	NA	NA	NO	BSL
	7440-22-4	Silver	8.40E-02 J	2.70E-01 J	mg/kg	VWW06-SO132	2 / 6	6.70E-02 - 6.90E-01	2.70E-01	8.40E-02	3.90E+01	nc	NA	NA	NO	BSL
	7440-23-5	Sodium	3.11E+03	1.09E+04 J	mg/kg	VWW06-SD008	6 / 6	4.40E+01 - 2.30E+02	1.09E+04	6.30E+03	NUT	--	NA	NA	NO	NUT
	7440-62-2	Vanadium	9.58E+00 J	1.08E+02	mg/kg	VWW06-SO136	6 / 6	3.70E-02 - 1.42E+00	1.08E+02	6.30E+01	3.90E+01	nc	NA	NA	YES	ASL
	7440-66-6	Zinc	1.10E+01 J	1.27E+02 J	mg/kg	VWW06-SO142	6 / 6	2.00E-01 - 2.94E+00	1.27E+02	3.10E+01	2.30E+03	nc	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	1.70E-03 J	3.56E-02 J	mg/kg	VWW06-SO132	2 / 6	4.30E-04 - 4.40E-02	3.56E-02	NA	2.00E+00	ca	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	2.30E-03 J	8.60E-02	mg/kg	VWW06-SO132	4 / 6	2.30E-04 - 1.60E-02	8.60E-02	NA	1.40E+00	ca	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	7.00E-03 J	3.52E-01	mg/kg	VWW06-SO132	2 / 6	3.20E-04 - 4.40E-02	3.52E-01	NA	1.70E+00	ca	NA	NA	NO	BSL
	11097-69-1	Aroclor-1254	6.13E-02	1.20E-01 J	mg/kg	VWW06-SD011	2 / 6	6.80E-03 - 2.40E-02	1.20E-01	NA	1.10E-01	nc	NA	NA	YES	ASL
	1336-36-3	Polychlorinated biphenyls (PCBs)	6.13E-02	6.13E-02	mg/kg	VWW06-SO142	1 / 4	2.20E-02 - 4.70E-02	6.13E-02	NA	2.20E-01	ca	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	3.06E-02 J	8.20E-02 J	mg/kg	VWW06-SO132	3 / 6	1.40E-03 - 3.90E-02	8.20E-02	NA	1.50E-01	ca	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	2.91E-02 J	1.22E-01	mg/kg	VWW06-SO132	3 / 6	1.80E-03 - 3.80E-02	1.22E-01	NA	1.50E-02	ca	NA	NA	YES	ASL
	205-99-2	Benzo(b)fluoranthene	2.74E-02 J	2.13E-01	mg/kg	VWW06-SO132	5 / 6	1.90E-03 - 3.90E-02	2.13E-01	NA	1.50E-01	ca	NA	NA	YES	ASL
	191-24-2	Benzo(g,h,i)perylene	1.72E-02 J	8.70E-02	mg/kg	VWW06-SO132	3 / 6	3.00E-03 - 3.80E-02	8.70E-02	NA	1.70E+02	nc	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	1.52E-02 J	7.16E-02	mg/kg	VWW06-SO132	3 / 6	2.00E-03 - 3.80E-02	7.16E-02	NA	1.50E+00	ca	NA	NA	NO	BSL
	218-01-9	Chrysene	2.65E-02 J	9.19E-02	mg/kg	VWW06-SO132	3 / 6	1.30E-03 - 3.80E-02	9.19E-02	NA	1.50E+01	ca	NA	NA	NO	BSL
	206-44-0	Fluoranthene	4.36E-02 J	1.01E-01 J	mg/kg	VWW06-SO132	3 / 6	1.30E-03 - 2.40E-01	1.01E-01	NA	2.30E+02	nc	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.68E-02 J	1.26E-01	mg/kg	VWW06-SO132	3 / 6	2.90E-03 - 3.80E-02	1.26E-01	NA	1.50E-01	ca	NA	NA	NO	BSL
	85-01-8	Phenanthrene	1.75E-02 J	1.75E-02 J	mg/kg	VWW06-SD011	1 / 6	1.30E-03 - 2.40E-01	1.75E-02	NA	1.70E+03	nc	NA	NA	NO	BSL
	129-00-0	Pyrene	3.88E-02 J	9.95E-02 J	mg/kg	VWW06-SO132	3 / 6	1.30E-03 - 2.40E-01	9.95E-02	NA	1.70E+02	nc	NA	NA	NO	BSL
	18540-29-9	Chromium (hexavalent)	1.84E+00 J	2.38E+00 J	mg/kg	VWW06-SD011	2 / 2	2.60E-01 - 2.95E-01	2.38E+00	NA	2.90E-01	ca	NA	NA	YES	ASL
	67-64-1	Acetone	4.60E-03 J	4.60E-03 J	mg/kg	VWW06-SD011	1 / 2	1.20E-03 - 1.40E-03	4.60E-03	NA	6.10E+03	nc	NA	NA	NO	BSL
	127-18-4	Tetrachloroethene	2.00E-03 J	2.00E-03 J	mg/kg	VWW06-SD008, VWW06-SD011	2 / 2	8.60E-04 - 9.70E-04	2.00E-03	NA	8.60E+00	nc	NA	NA	NO	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)

(1) Maximum concentration is used for screening.

(2) Background values are the 95 percent upper confidence limit of the 95th percentile (95/95 UTL) for West Vieques soil type Qs.

(3) Regional Screening Levels for Residential Soil (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

The SL for 'Antimony (metallic)' was used as the SL for Antimony.
The SL for 'Cadmium (diet)' was used as the SL for Cadmium.
The SL for 'Chromium III' was used as the SL for Chromium.
The SL for Lead is based on the USEPA lead working group.
The SL for 'Manganese Non-diet' was used as the SL for Manganese.
The SL for 'Methyl Mercury' was used as the SL for Mercury.
The SL for 'Nickel Soluble Salts' was used as the SL for Nickel.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.
The SL for 'Zinc and compounds' was used as the SL for Zinc.
The SL for High Risk Polychlorinated Biphenyls was used as the SL for PCBs.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene
The SL for Anthracene was used as the SL for Phenanthrene.

(4) Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
HQ = Hazard quotient
NA = Not available
J = analyte was detected below the reporting limit in the sample
SL = Screening Level
IEUBK = Integrated Exposure Uptake Biokinetic Model

TABLE 2.1a
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future (Maintenance Worker/Industrial Worker/Construction Worker)
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
North Area Surface Soil (0 - 6 inches)	7429-90-5	Aluminum	2.12E+03	J	1.62E+04		mg/kg	VWW06-SO136	6 / 6	1.10E+00 - 1.69E+01	1.62E+04	1.10E+04	9.90E+04	nc	NA	NA	NO	BSL
	7440-36-0	Antimony	1.20E+00	J	2.10E+00	J	mg/kg	VWW06-SO132	3 / 6	2.26E-01 - 1.70E+01	2.10E+00	1.00E+00	4.10E+01	nc	NA	NA	NO	BSL
	7440-38-2	Arsenic	4.80E-01	J	1.80E+00		mg/kg	VWW06-SO132	6 / 6	2.30E-01 - 1.00E+00	1.80E+00	2.10E+00	1.60E+00	ca	NA	NA	YES	ASL
	7440-39-3	Barium	1.03E+01	J	5.87E+01		mg/kg	VWW06-SO142	6 / 6	5.30E-01 - 1.42E+00	5.87E+01	2.40E+01	1.90E+04	nc	NA	NA	NO	BSL
	7440-41-7	Beryllium	1.30E-01	J	3.20E-01	J	mg/kg	VWW06-SO142	3 / 6	1.10E-01 - 1.42E+00	3.20E-01	4.10E-01	2.00E+02	nc	NA	NA	NO	BSL
	7440-43-9	Cadmium	1.20E-01	J	7.90E-01		mg/kg	VWW06-SO132	5 / 6	5.60E-02 - 4.45E-01	7.90E-01	4.00E-02	8.00E+01	nc	NA	NA	NO	BSL
	7440-70-2	Calcium	4.18E+03		1.24E+05		mg/kg	VWW06-SO137	6 / 6	5.30E+00 - 2.94E+01	1.24E+05	2.10E+05	NUT	--	NA	NA	NO	NUT
	7440-47-3	Chromium	3.30E+00	J	2.46E+01		mg/kg	VWW06-SO136	6 / 6	8.50E-02 - 1.30E-01	2.46E+01	4.80E+01	1.50E+05	nc	NA	NA	NO	BSL
	7440-48-4	Cobalt	9.25E-01	J	1.65E+01		mg/kg	VWW06-SO136	6 / 6	4.40E-02 - 4.45E-01	1.65E+01	1.30E+01	3.00E+01	nc	NA	NA	NO	BSL
	7440-50-8	Copper	5.08E+00	J	7.20E+01	J	mg/kg	VWW06-SD011	6 / 6	1.10E-01 - 1.42E+00	7.20E+01	3.50E+01	4.10E+03	nc	NA	NA	NO	BSL
	7439-89-6	Iron	3.31E+03	J	3.22E+04		mg/kg	VWW06-SO136	6 / 6	1.50E+00 - 5.34E+00	3.22E+04	1.80E+04	7.20E+04	nc	NA	NA	NO	BSL
	7439-92-1	Lead	4.00E+00	J	1.45E+02		mg/kg	VWW06-SO132	6 / 6	2.90E-01 - 3.02E+00	1.45E+02	6.90E+00	8.00E+02	ALM	NA	NA	NO	BSL
	7439-95-4	Magnesium	3.08E+03		1.15E+04		mg/kg	VWW06-SO136	6 / 6	5.30E+00 - 2.58E+01	1.15E+04	1.10E+04	NUT	--	NA	NA	NO	NUT
	7439-96-5	Manganese	7.56E+01		9.61E+02		mg/kg	VWW06-SO142	6 / 6	3.50E-02 - 1.42E+00	9.61E+02	3.60E+02	2.30E+03	nc	NA	NA	NO	BSL
	7439-97-6	Mercury	7.42E-03	J	3.50E-02	J	mg/kg	VWW06-SO132	5 / 6	2.48E-03 - 9.30E-02	3.50E-02	1.60E-02	1.00E+01	nc	NA	NA	NO	BSL
	7440-02-0	Nickel	3.56E+00	J	1.81E+01		mg/kg	VWW06-SO142	5 / 6	1.70E-01 - 1.42E+00	1.81E+01	2.60E+01	2.00E+03	nc	NA	NA	NO	BSL
	7440-09-7	Potassium	6.40E+02		2.80E+03		mg/kg	VWW06-SO142	6 / 6	5.30E+00 - 4.45E+01	2.80E+03	1.70E+03	NUT	--	NA	NA	NO	NUT
	7782-49-2	Selenium	2.40E+00	J	4.40E+00	J	mg/kg	VWW06-SO137	2 / 6	1.30E-01 - 1.10E+01	4.40E+00	6.80E-01	5.10E+02	nc	NA	NA	NO	BSL
	7440-22-4	Silver	8.40E-02	J	2.70E-01	J	mg/kg	VWW06-SO132	2 / 6	6.70E-02 - 6.90E-01	2.70E-01	8.40E-02	5.10E+02	nc	NA	NA	NO	BSL
	7440-23-5	Sodium	3.11E+03		1.09E+04	J	mg/kg	VWW06-SD008	6 / 6	4.40E+01 - 2.30E+02	1.09E+04	6.30E+03	NUT	--	NA	NA	NO	NUT
	7440-62-2	Vanadium	9.58E+00	J	1.08E+02		mg/kg	VWW06-SO136	6 / 6	3.70E-02 - 1.42E+00	1.08E+02	6.30E+01	5.20E+02	nc	NA	NA	NO	BSL
	7440-66-6	Zinc	1.10E+01	J	1.27E+02	J	mg/kg	VWW06-SO142	6 / 6	2.00E-01 - 2.94E+00	1.27E+02	3.10E+01	3.10E+04	nc	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	1.70E-03	J	3.56E-02	J	mg/kg	VWW06-SO132	2 / 6	4.30E-04 - 4.40E-02	3.56E-02	NA	7.20E+00	ca	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	2.30E-03	J	8.60E-02		mg/kg	VWW06-SO132	4 / 6	2.30E-04 - 1.60E-02	8.60E-02	NA	5.10E+00	ca	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	7.00E-03	J	3.52E-01		mg/kg	VWW06-SO132	2 / 6	3.20E-04 - 4.40E-02	3.52E-01	NA	7.00E+00	ca	NA	NA	NO	BSL
	11097-69-1	Aroclor-1254	6.13E-02		1.20E-01	J	mg/kg	VWW06-SD011	2 / 6	6.80E-03 - 2.40E-02	1.20E-01	NA	7.40E-01	ca	NA	NA	NO	BSL
	1336-36-3	Polychlorinated biphenyls (PCBs)	6.13E-02		6.13E-02		mg/kg	VWW06-SO142	1 / 4	2.20E-02 - 4.70E-02	6.13E-02	NA	7.40E-01	ca	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	3.06E-02	J	8.20E-02	J	mg/kg	VWW06-SO132	3 / 6	1.40E-03 - 3.90E-02	8.20E-02	NA	2.10E+00	ca	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	2.91E-02	J	1.22E-01		mg/kg	VWW06-SO132	3 / 6	1.80E-03 - 3.80E-02	1.22E-01	NA	2.10E-01	ca	NA	NA	NO	BSL
	205-99-2	Benzo(b)fluoranthene	2.74E-02	J	2.13E-01		mg/kg	VWW06-SO132	5 / 6	1.90E-03 - 3.90E-02	2.13E-01	NA	2.10E+00	ca	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	1.72E-02	J	8.70E-02		mg/kg	VWW06-SO132	3 / 6	3.00E-03 - 3.80E-02	8.70E-02	NA	1.70E+03	nc	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	1.52E-02	J	7.16E-02		mg/kg	VWW06-SO132	3 / 6	2.00E-03 - 3.80E-02	7.16E-02	NA	2.10E+01	ca	NA	NA	NO	BSL
	218-01-9	Chrysene	2.65E-02	J	9.19E-02		mg/kg	VWW06-SO132	3 / 6	1.30E-03 - 3.80E-02	9.19E-02	NA	2.10E+02	ca	NA	NA	NO	BSL
	206-44-0	Fluoranthene	4.36E-02	J	1.01E-01	J	mg/kg	VWW06-SO132	3 / 6	1.30E-03 - 2.40E-01	1.01E-01	NA	2.20E+03	nc	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.68E-02	J	1.26E-01		mg/kg	VWW06-SO132	3 / 6	2.90E-03 - 3.80E-02	1.26E-01	NA	2.10E+00	ca	NA	NA	NO	BSL
	85-01-8	Phenanthrene	1.75E-02	J	1.75E-02	J	mg/kg	VWW06-SD011	1 / 6	1.30E-03 - 2.40E-01	1.75E-02	NA	1.70E+04	nc	NA	NA	NO	BSL
	129-00-0	Pyrene	3.88E-02	J	9.95E-02	J	mg/kg	VWW06-SO132	3 / 6	1.30E-03 - 2.40E-01	9.95E-02	NA	1.70E+03	nc	NA	NA	NO	BSL
	18540-29-9	Chromium (hexavalent)	1.84E+00	J	2.38E+00	J	mg/kg	VWW06-SD011	2 / 2	2.60E-01 - 2.95E-01	2.38E+00	NA	5.60E+00	ca	NA	NA	NO	BSL
	67-64-1	Acetone	4.60E-03	J	4.60E-03	J	mg/kg	VWW06-SD011	1 / 2	1.20E-03 - 1.40E-03	4.60E-03	NA	6.30E+04	nc	NA	NA	NO	BSL
	127-18-4	Tetrachloroethene	2.00E-03	J	2.00E-03	J	mg/kg	VWW06-SD008, VWW06-SD011	2 / 2	8.60E-04 - 9.70E-04	2.00E-03	NA	4.10E+01	nc	NA	NA	NO	BSL

TABLE 2.1a
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future (Maintenance Worker/Industrial Worker/Construction Worker)
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)

(1) Maximum concentration is used for screening.

(2) Background values are the 95 percent upper confidence limit of the 95th percentile (95/95 UTL) for West Vieques soil type Qs.

(3) Regional Screening Levels for Industrial Soil (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

The SL for 'Antimony (metallic)' was used as the SL for Antimony.
The SL for 'Cadmium (diet)' was used as the SL for Cadmium.
The SL for 'Chromium III' was used as the SL for Chromium.
The SL for Lead is based on the USEPA lead working group.
The SL for 'Manganese Non-diet' was used as the SL for Manganese.
The SL for 'Methyl Mercury' was used as the SL for Mercury.
The SL for 'Nickel Soluble Salts' was used as the SL for Nickel.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.
The SL for 'Zinc and compounds' was used as the SL for Zinc.
The SL for High Risk Polychlorinated Biphenyls was used as the SL for PCBs.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene
The SL for Anthracene was used as the SL for Phenanthrene.

(4) Rationale Codes — Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
HQ = Hazard quotient
NA = Not available
J = analyte was detected below the reporting limit in the sample
SL = Screening Level
ALM = Adult Lead Methodology

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
PCB Removal Area Surface Soil (0 - 6 inches)	11097-69-1	Aroclor-1254	9.80E-02	9.80E-02	mg/kg	VWW06-SS012	1 / 2	6.80E-03 - 7.90E-03	9.80E-02	NA	1.10E-01	nc	NA	NA	NO	BSL

(1) Maximum concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

(3) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)
No Toxicity Information (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
HQ = Hazard quotient
NA = Not available
SL = Screening Level

TABLE 2.2a
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future (Maintenance Worker/Industrial Worker/Construction Worker)
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
PCB Removal Area Surface Soil (0 - 6 inches)	11097-69-1	Aroclor-1254	9.80E-02	9.80E-02	mg/kg	VWW06-SS012	1 / 2	6.80E-03 - 7.90E-03	9.80E-02	NA	7.40E-01	ca	NA	NA	NO	BSL

(1) Maximum concentration is used for screening.

(2) Regional Screening Levels for Industrial Soil (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

(3) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)
No Toxicity Information (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
HQ = Hazard quotient
NA = Not available
SL = Screening Level

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water (Recreational User/Trespasser/Site Visitor)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Surface Water	7440-36-0	Antimony	1.03E+01	J	1.03E+01	J	UG/L	VWW06-SW003	1 / 5	1.00E+01 - 1.00E+02	1.03E+01	3.68E+01	6.0E-01	nc	5.6	WQS	YES	ASL
	7440-39-3	Barium	5.74E+00	J	1.61E+01	J	UG/L	VWW06-SW004	5 / 5	4.40E+00 - 4.40E+00	1.61E+01	3.39E+01	2.9E+02	nc	NA	NA	NO	BSL
	7440-43-9	Cadmium	1.59E+01	J	1.59E+01	J	UG/L	VWW06-SW004	1 / 5	4.20E+00 - 1.44E+01	1.59E+01	1.25E+01	6.9E-01	nc	5	WQS	YES	ASL
	7440-70-2	Calcium	4.19E+05	J	5.23E+05	J	UG/L	VWW06-SW004	5 / 5	7.80E+02 - 7.80E+02	5.23E+05	5.39E+05	NUT	--	NA	NA	NO	NUT
	7439-89-6	Iron	3.92E+02	J	8.13E+02	J	UG/L	VWW06-SW004	3 / 5	1.10E+02 - 1.10E+02	8.13E+02	5.27E+03	1.1E+03	nc	NA	NA	NO	BSL
	7439-95-4	Magnesium	1.18E+06	J	1.36E+06	J	UG/L	VWW06-SW004, VWW06-SW006	5 / 5	1.96E+02 - 1.96E+02	1.36E+06	1.62E+05	NUT	--	NA	NA	NO	NUT
	7439-97-6	Mercury	4.11E-02	J	4.11E-02	J	UG/L	VWW06-SW003	1 / 5	3.70E-02 - 3.70E-02	4.11E-02	5.48E-02	1.6E-01	nc	0.05	WQS	NO	BSL
	7440-09-7	Potassium	4.33E+05		5.44E+05		UG/L	VWW06-SW004	5 / 5	1.43E+03 - 1.43E+03	5.44E+05	5.33E+05	NUT	--	NA	NA	NO	NUT
	7440-23-5	Sodium	1.08E+07		1.59E+07		UG/L	VWW06-SW004	5 / 5	9.00E+03 - 1.80E+04	1.59E+07	1.38E+05	NUT	--	NA	NA	NO	NUT
	7440-28-0	Thallium	1.21E+02	J	1.21E+02	J	UG/L	VWW06-SW003	1 / 5	8.80E+01 - 8.80E+01	1.21E+02	NA	1.6E-02	nc	0.24	WQS	YES	ASL
	86-73-7	Fluorene	4.30E-02	J	5.50E-02	J	UG/L	VWW06-SW007	3 / 5	2.00E-02 - 2.10E-02	5.50E-02	NA	2.2E+01	nc	1100	WQS	NO	BSL
	85-01-8	Phenanthrene	6.40E-02		7.90E-02	J	UG/L	VWW06-SW007	3 / 5	2.00E-02 - 2.10E-02	7.90E-02	NA	1.3E+02	nc	NA	NA	NO	BSL
	18540-29-9	Chromium (hexavalent)	1.20E+01	J	4.10E+01	J	UG/L	VWW06-SW005	5 / 5	3.50E+00 - 3.50E+00	4.10E+01	9.90E+01	3.1E-02	ca	NA	NA	YES	ASL

(1) Maximum concentration is used for screening.

(2) Background values are the 95 percent upper confidence limit of the 95th percentile (95/95 UTL) and were calculated using surface water data collected from three nearby lagoons (Laguna Kiani, Laguna El Pobre, and Laguna Punta Arenas).

(3) Regional Screening Levels for Tapwater (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for 'Methyl Mercury' was used as the SL for Mercury and Dissolved Mercury.
The SL for 'Antimony (metallic)' was used as the SL for Antimony.
The SL for Anthracene was used as the SL for Phenanthrene.

(4) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
HQ = Hazard quotient
NA = Not available
J = analyte was detected below the reporting limit in the sample
SL = Screening Level
AL = Federal Action Level for lead
WQS = Water Quality Standard from the Puerto Rico Water Quality Standards Regulations (March, 2010). The protection for the water body or aquatic life for reasons of human health was provided.

TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment (Recreational User/Trespasser/Site Visitor)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Minimum Concentration Qualifier	Maximum Concentration	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Sediment	7429-90-5	Aluminum	5.46E+03	J	1.44E+04	J	MG/KG	VWW06-SD009	7 / 7	1.62E+01 - 2.97E+01	1.44E+04	3.50E+04	7.70E+03	nc	NA	NA	YES	ASL
	7440-36-0	Antimony	3.96E-01	J	3.88E+00	J	MG/KG	VWW06-SD006	5 / 7	2.76E-01 - 5.90E-01	3.88E+00	NA	3.10E+00	nc	NA	NA	YES	ASL
	7440-38-2	Arsenic	1.20E+00	J	7.80E+00	J	MG/KG	VWW06-SD009	7 / 7	4.20E-01 - 1.00E+00	7.80E+00	2.88E+01	3.90E-01	ca	NA	NA	YES	ASL
	7440-39-3	Barium	7.39E+00	J	3.38E+01	J	MG/KG	VWW06-SD009	7 / 7	1.36E+00 - 2.50E+00	3.38E+01	2.05E+01	1.50E+03	nc	NA	NA	NO	BSL
	7440-43-9	Cadmium	9.03E-01	J	5.69E+00	J	MG/KG	VWW06-SD009	7 / 7	4.27E-01 - 7.83E-01	5.69E+00	NA	7.00E+00	nc	NA	NA	NO	BSL
	7440-70-2	Calcium	7.29E+04	J	1.40E+05	J	MG/KG	VWW06-SD006	7 / 7	2.82E+01 - 5.17E+01	1.40E+05	6.67E+04	NUT	--	NA	NA	NO	NUT
	7440-47-3	Chromium	5.90E+00	J	3.70E+01	J	MG/KG	VWW06-SD009	7 / 7	1.60E-01 - 3.90E-01	3.70E+01	1.51E+01	1.20E+04	nc	NA	NA	NO	BSL
	7440-48-4	Cobalt	1.77E+00	J	9.00E+00	J	MG/KG	VWW06-SD009	7 / 7	4.27E-01 - 7.83E-01	9.00E+00	9.37E+00	2.30E+00	nc	NA	NA	YES	ASL
	7440-50-8	Copper	1.36E+01	J	2.04E+02	J	MG/KG	VWW06-SD009	7 / 7	1.36E+00 - 2.50E+00	2.04E+02	5.41E+01	3.10E+02	nc	NA	NA	NO	BSL
	7439-89-6	Iron	6.75E+03	J	4.59E+04	J	MG/KG	VWW06-SD009	7 / 7	5.12E+00 - 9.39E+00	4.59E+04	4.39E+04	5.50E+03	nc	NA	NA	YES	ASL
	7439-92-1	Lead	1.18E+01	J	6.12E+02	J	MG/KG	VWW06-SD009	7 / 7	2.90E+00 - 5.32E+00	6.12E+02	1.51E+01	4.00E+02	IEUBK	NA	NA	YES	ASL
	7439-95-4	Magnesium	3.58E+03	J	1.19E+04	J	MG/KG	VWW06-SD009	7 / 7	2.48E+01 - 4.54E+01	1.19E+04	1.75E+04	NUT	--	NA	NA	NO	NUT
	7439-96-5	Manganese	6.01E+01	J	3.56E+02	J	MG/KG	VWW06-SD009	7 / 7	1.36E+00 - 2.50E+00	3.56E+02	4.55E+02	1.80E+02	nc	NA	NA	YES	ASL
	7439-97-6	Mercury	2.05E-02	J	1.29E-01	J	MG/KG	VWW06-SD009	7 / 7	3.14E-03 - 6.52E-03	1.29E-01	1.38E-01	7.80E-01	nc	NA	NA	NO	BSL
	7440-02-0	Nickel	6.41E+00	J	1.91E+01	J	MG/KG	VWW06-SD009	6 / 7	1.36E+00 - 2.50E+00	1.91E+01	9.68E+00	1.50E+02	nc	NA	NA	NO	BSL
	7440-09-7	Potassium	1.17E+03	J	3.45E+03	J	MG/KG	VWW06-SD009	7 / 7	4.27E+01 - 7.83E+01	3.45E+03	6.09E+03	NUT	--	NA	NA	NO	NUT
	7440-22-4	Silver	2.46E-01	J	2.95E-01	J	MG/KG	VWW06-SD003	2 / 7	1.84E-01 - 3.94E-01	2.95E-01	NA	3.90E+01	nc	NA	NA	NO	BSL
	7440-23-5	Sodium	8.01E+03	J	2.78E+04	J	MG/KG	VWW06-SD009	7 / 7	8.54E+01 - 1.56E+02	2.78E+04	9.64E+04	NUT	--	NA	NA	NO	NUT
	7440-28-0	Thallium	5.17E+00	J	5.17E+00	J	MG/KG	VWW06-SD005	1 / 7	2.90E+00 - 5.32E+00	5.17E+00	1.69E+00	7.80E-02	nc	NA	NA	YES	ASL
	7440-62-2	Vanadium	1.76E+01	J	6.61E+01	J	MG/KG	VWW06-SD009	7 / 7	1.36E+00 - 2.50E+00	6.61E+01	7.17E+01	3.90E+01	nc	NA	NA	YES	ASL
	7440-66-6	Zinc	2.54E+01	J	8.49E+02	J	MG/KG	VWW06-SD009	7 / 7	2.82E+00 - 5.17E+00	8.49E+02	8.73E+01	2.30E+03	nc	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	2.80E-03	J	5.90E-02	J	MG/KG	VWW06-SD003	6 / 7	1.30E-03 - 2.50E-03	5.90E-02	NA	2.00E+00	ca	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	5.90E-03	J	9.40E-02	J	MG/KG	VWW06-SD003	6 / 7	6.90E-04 - 1.30E-03	9.40E-02	NA	1.40E+00	ca	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	3.20E-03	J	3.20E-03	J	MG/KG	VWW06-SD003	1 / 7	9.80E-04 - 1.90E-03	3.20E-03	NA	1.70E+00	ca	NA	NA	NO	BSL
	11097-69-1	Aroclor-1254	3.00E-02	J	2.60E-01	J	MG/KG	VWW06-SD009	5 / 7	1.20E-02 - 2.30E-02	2.60E-01	NA	1.10E-01	nc	NA	NA	YES	ASL
	83-32-9	Acenaphthene	1.19E-02	J	1.19E-02	J	MG/KG	VWW06-SD004	1 / 7	2.00E-03 - 1.66E-02	1.19E-02	NA	3.40E+02	nc	NA	NA	NO	BSL
	208-96-8	Acenaphthylene	2.00E-02	J	2.00E-02	J	MG/KG	VWW06-SD006	1 / 7	2.00E-03 - 1.66E-02	2.00E-02	NA	3.40E+02	nc	NA	NA	NO	BSL
	120-12-7	Anthracene	1.88E-02	J	2.82E-02		MG/KG	VWW06-SD004	2 / 7	2.00E-03 - 1.66E-02	2.82E-02	NA	1.70E+03	nc	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	4.70E-03	J	1.02E-01	J	MG/KG	VWW06-SD006	7 / 7	2.10E-03 - 1.74E-02	1.02E-01	NA	1.50E-01	ca	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	6.70E-03	J	1.10E-01	J	MG/KG	VWW06-SD006	7 / 7	2.80E-03 - 2.24E-02	1.10E-01	NA	1.50E-02	ca	NA	NA	YES	ASL
	205-99-2	Benzo(b)fluoranthene	1.07E-02	J	1.60E-01	J	MG/KG	VWW06-SD006	7 / 7	2.90E-03 - 2.37E-02	1.60E-01	NA	1.50E-01	ca	NA	NA	YES	ASL
	191-24-2	Benzo(g,h,i)perylene	3.88E-02		6.22E-02	J	MG/KG	VWW06-SD006	4 / 7	4.70E-03 - 3.86E-02	6.22E-02	NA	1.70E+02	nc	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	4.20E-03	J	6.34E-02	J	MG/KG	VWW06-SD006	7 / 7	3.20E-03 - 2.62E-02	6.34E-02	NA	1.50E+00	ca	NA	NA	NO	BSL
	218-01-9	Chrysene	6.80E-03	J	9.24E-02	J	MG/KG	VWW06-SD006	7 / 7	2.00E-03 - 1.62E-02	9.24E-02	NA	1.50E+01	ca	NA	NA	NO	BSL
	206-44-0	Fluoranthene	8.50E-03	J	1.22E-01	J	MG/KG	VWW06-SD006	7 / 7	2.00E-03 - 1.66E-02	1.22E-01	NA	2.30E+02	nc	NA	NA	NO	BSL
	86-73-7	Fluorene	1.16E-02	J	1.16E-02	J	MG/KG	VWW06-SD004	1 / 7	2.00E-03 - 1.66E-02	1.16E-02	NA	2.30E+02	nc	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	3.49E-02		6.14E-02	J	MG/KG	VWW06-SD006	4 / 7	4.60E-03 - 3.74E-02	6.14E-02	NA	1.50E-01	ca	NA	NA	NO	BSL
	85-01-8	Phenanthrene	8.70E-03	J	1.11E-01		MG/KG	VWW06-SD004	6 / 7	2.00E-03 - 1.66E-02	1.11E-01	NA	1.70E+03	nc	NA	NA	NO	BSL
	129-00-0	Pyrene	7.30E-03	J	1.25E-01		MG/KG	VWW06-SD004	7 / 7	2.00E-03 - 1.66E-02	1.25E-01	NA	1.70E+02	nc	NA	NA	NO	BSL
	78-93-3	2-Butanone	5.60E-03	J	4.73E-02	J	MG/KG	VWW06-SD009	6 / 7	2.00E-03 - 4.90E-03	4.73E-02	NA	2.80E+03	nc	NA	NA	NO	BSL
	67-64-1	Acetone	2.96E-02	J	1.58E-01	J	MG/KG	VWW06-SD009	7 / 7	1.80E-03 - 4.60E-03	1.58E-01	NA	6.10E+03	nc	NA	NA	NO	BSL
	75-15-0	Carbon disulfide	3.40E-03	J	1.30E-02	J	MG/KG	VWW06-SD009	3 / 7	2.10E-03 - 5.20E-03	1.30E-02	NA	8.20E+01	nc	NA	NA	NO	BSL
	127-18-4	Tetrachloroethene	1.60E-03	J	2.80E-03	J	MG/KG	VWW06-SD003	5 / 7	1.30E-03 - 3.20E-03	2.80E-03	NA	8.60E+00	nc	NA	NA	NO	BSL
	18540-29-9	Chromium (hexavalent)	1.92E+00	J	1.20E+01	J	MG/KG	VWW06-SD009	5 / 7	3.87E-01 - 7.93E-01	1.20E+01	2.19E+02	2.90E-01	ca	NA	NA	YES	ASL

TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment (Recreational User/Trespasser/Site Visitor)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)

(1) Maximum concentration is used for screening.

(2) Background values are the 95 percent upper confidence limit of the 95th percentile (95/95 UTL) and were calculated using .

(3) Regional Screening Levels for Residential Soil (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

The SL for 'Antimony (metallic)' was used as the SL for Antimony.
The SL for 'Cadmium (diet)' was used as the SL for Cadmium.
The SL for 'Chromium III' was used as the SL for Chromium.
The SL for Lead is based on the USEPA lead working group.
The SL for 'Manganese Non-diet' was used as the SL for Manganese.
The SL for 'Methyl Mercury' was used as the SL for Mercury.
The SL for 'Nickel Soluble Salts' was used as the SL for Nickel.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.
The SL for 'Zinc and compounds' was used as the SL for Zinc.
The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene
The SL for Anthracene was used as the SL for Phenanthrene.

(4) Rationale Codes — Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
HQ = Hazard quotient
NA = Not available
J = analyte was detected below the reporting limit in the sample
SL = Screening Level
IEUBK = Integrated Exposure Uptake Biokinetic Model

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Fish/Blue Crab (Fish Consumer/Crab Consumer)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)	Bioaccumulative (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (5), (6)
Lagoon	7440-36-0	Antimony	1.03E+01 J	1.03E+01 J	UG/L	VWW06-SW003	1 / 5	1.00E+01 - 1.00E+02	1.03E+01	3.68E+01	6.4E+02	No	5.6	WQS	No	BSL
	7440-39-3	Barium	5.74E+00 J	1.61E+01 J	UG/L	VWW06-SW004	5 / 5	4.40E+00 - 4.40E+00	1.61E+01	3.39E+01	1.0E+03	No	NA	NA	No	BSL
	7440-43-9	Cadmium	1.59E+01 J	1.59E+01 J	UG/L	VWW06-SW004	1 / 5	4.20E+00 - 1.44E+01	1.59E+01	1.25E+01	5.0E+00	Yes	5	WQS	Yes	ASL (7)
	7440-70-2	Calcium	4.19E+05 J	5.23E+05 J	UG/L	VWW06-SW004	5 / 5	7.80E+02 - 7.80E+02	5.23E+05	5.39E+05	NUT	No	NA	NA	No	NUT
	7439-89-6	Iron	3.92E+02 J	8.13E+02 J	UG/L	VWW06-SW004	3 / 5	1.10E+02 - 1.10E+02	8.13E+02	5.27E+03	3.0E+02	No	NA	NA	No	BKG
	7439-95-4	Magnesium	1.18E+06 J	1.36E+06 J	UG/L	VWW06-SW004, VWW06-SW006	5 / 5	1.96E+02 - 1.96E+02	1.36E+06	1.62E+05	NUT	No	NA	NA	No	NUT
	7439-97-6	Mercury	4.11E-02 J	4.11E-02 J	UG/L	VWW06-SW003	1 / 5	3.70E-02 - 3.70E-02	4.11E-02	5.48E-02	NA	Yes	0.05	WQS	No	BKG
	7440-09-7	Potassium	4.33E+05	5.44E+05	UG/L	VWW06-SW004	5 / 5	1.43E+03 - 1.43E+03	5.44E+05	5.33E+05	NUT	No	NA	NA	No	NUT
	7440-23-5	Sodium	1.08E+07	1.59E+07	UG/L	VWW06-SW004	5 / 5	9.00E+03 - 1.80E+04	1.59E+07	1.38E+05	NUT	No	NA	NA	No	NUT
	7440-28-0	Thallium	1.21E+02 J	1.21E+02 J	UG/L	VWW06-SW003	1 / 5	8.80E+01 - 8.80E+01	1.21E+02	NA	4.7E-01	No	0.24	WQS	Yes	ASL
	86-73-7	Fluorene	4.30E-02 J	5.50E-02 J	UG/L	VWW06-SW007	3 / 5	2.00E-02 - 2.10E-02	5.50E-02	NA	5.3E+03	No	1100	WQS	No	BSL
	85-01-8	Phenanthrene	6.40E-02	7.90E-02 J	UG/L	VWW06-SW007	3 / 5	2.00E-02 - 2.10E-02	7.90E-02	NA	NA	No	NA	NA	No	NBAC
	18540-29-9	Chromium (hexavalent)	1.20E+01 J	4.10E+01 J	UG/L	VWW06-SW005	5 / 5	3.50E+00 - 3.50E+00	4.10E+01	9.90E+01	1.0E+02	Yes	NA	NA	No	BSL

(1) Maximum concentration is used for screening.

(2) Background values are the 95 percent upper confidence limit of the 95 th percentile (95/95 UTL) and were calculated using surface water data collected from three nearby lagoons (Laguna Kiani, Laguna El Pobre, and Laguna Punta Arenas).

(3) National Recommended Water Quality Criteria (EPA, 2009). Values are for the consumption of an organism. If a value for the consumption of an organism was not available, the value for consumption of an organism and water was used.

(4) Organic chemicals considered bioaccumulative if Kow exceeded 3 and inorganic chemicals considered bioaccumulative according to EPA's Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs (EPA, 2000). According to the Toxicological Profile for Polycyclic Aromatic Hydrocarbons (ATSDR, 1995), PAHs are readily metabolized by fish and are not expected to bioaccumulate in fish tissue.

(5) Bioaccumulative chemicals with concentrations less than the NRWQC or background were not selected as COPCs.

Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)
Not Bioaccumulative (NBAC)
Below Background (BKG)

(6) Kow values (Oak Ridge National Laboratory, 2012). Available online: http://rais.ornl.gov/cgi-bin/tools/TOX_search

Fluorene	4.2E+00
Phenanthrene	4.5E+00

(7) Cadmium was identified as a COPC in both surface water and sediment for the fish and blue crab consumption exposure pathways; therefore, potential exposures and risks will only be quantified using sediment data, consistent with the Vieques Master HHRA protocol.

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
ATSDR = Agency for Toxic Substances and Disease Registry
ca = Carcinogenic
COPC = Chemical of Potential Concern
HHRA = Human Health Risk Assessment
J = analyte was detected below the reporting limit in the sample
NA = Not available
nc = Noncarcinogenic
NRWQC = National Recommended Water Quality Criteria
PAH = Polycyclic Aromatic Hydrocarbons
SL = Screening Level
WQS = Water Quality Standard from the Puerto Rico Water Quality Standards Regulations (March, 2010). The protection for the water body or aquatic life for reasons of human health

TABLE 2.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Fish/Blue Crab (Fish Consumer/Crab Consumer)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Minimum Concentration Qualifier	Maximum Concentration	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Background Value (1)	Screening Toxicity Value (2)	Bioaccumulative (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Lagoon	7429-90-5	Aluminum	5.46E+03	J	1.44E+04	J	MG/KG	VWW06-SD009	7 / 7	1.62E+01 - 2.97E+01	3.50E+04	NA	No	NA	NA	No	NBAC
	7440-36-0	Antimony	3.96E-01	J	3.88E+00	J	MG/KG	VWW06-SD006	5 / 7	2.76E-01 - 5.90E-01	NA	NA	No	NA	NA	No	NBAC
	7440-38-2	Arsenic	1.20E+00	J	7.80E+00	J	MG/KG	VWW06-SD009	7 / 7	4.20E-01 - 1.00E+00	2.88E+01	NA	Yes	NA	NA	No	BKG
	7440-39-3	Barium	7.39E+00	J	3.38E+01	J	MG/KG	VWW06-SD009	7 / 7	1.36E+00 - 2.50E+00	2.05E+01	NA	No	NA	NA	No	NBAC
	7440-43-9	Cadmium	9.03E-01	J	5.69E+00	J	MG/KG	VWW06-SD009	7 / 7	4.27E-01 - 7.83E-01	NA	NA	Yes	NA	NA	Yes	BAC
	7440-70-2	Calcium	7.29E+04	J	1.40E+05	J	MG/KG	VWW06-SD006	7 / 7	2.82E+01 - 5.17E+01	6.67E+04	NA	No	NA	NA	No	NUT
	7440-47-3	Chromium	5.90E+00	J	3.70E+01	J	MG/KG	VWW06-SD009	7 / 7	1.60E-01 - 3.90E-01	1.51E+01	NA	Yes	NA	NA	Yes	BAC
	7440-48-4	Cobalt	1.77E+00	J	9.00E+00	J	MG/KG	VWW06-SD009	7 / 7	4.27E-01 - 7.83E-01	9.37E+00	NA	No	NA	NA	No	NBAC
	7440-50-8	Copper	1.36E+01	J	2.04E+02	J	MG/KG	VWW06-SD009	7 / 7	1.36E+00 - 2.50E+00	5.41E+01	NA	Yes	NA	NA	Yes	BAC
	7439-89-6	Iron	6.75E+03	J	4.59E+04	J	MG/KG	VWW06-SD009	7 / 7	5.12E+00 - 9.39E+00	4.39E+04	NA	No	NA	NA	No	NBAC
	7439-92-1	Lead	1.18E+01	J	6.12E+02	J	MG/KG	VWW06-SD009	7 / 7	2.90E+00 - 5.32E+00	1.51E+01	NA	Yes	NA	NA	Yes	BAC
	7439-95-4	Magnesium	3.58E+03	J	1.19E+04	J	MG/KG	VWW06-SD009	7 / 7	2.48E+01 - 4.54E+01	1.75E+04	NA	No	NA	NA	No	NUT
	7439-96-5	Manganese	6.01E+01	J	3.56E+02	J	MG/KG	VWW06-SD009	7 / 7	1.36E+00 - 2.50E+00	4.55E+02	NA	No	NA	NA	No	NBAC
	7439-97-6	Mercury	2.05E-02	J	1.29E-01	J	MG/KG	VWW06-SD009	7 / 7	3.14E-03 - 6.52E-03	1.38E-01	NA	Yes	NA	NA	No	BKG
	7440-02-0	Nickel	6.41E+00	J	1.91E+01	J	MG/KG	VWW06-SD009	6 / 7	1.36E+00 - 2.50E+00	9.68E+00	NA	Yes	NA	NA	Yes	BAC
	7440-09-7	Potassium	1.17E+03	J	3.45E+03	J	MG/KG	VWW06-SD009	7 / 7	4.27E+01 - 7.83E+01	6.09E+03	NA	No	NA	NA	No	NUT
	7440-22-4	Silver	2.46E-01	J	2.95E-01	J	MG/KG	VWW06-SD003	2 / 7	1.84E-01 - 3.94E-01	NA	NA	Yes	NA	NA	Yes	BAC
	7440-23-5	Sodium	8.01E+03	J	2.78E+04	J	MG/KG	VWW06-SD009	7 / 7	8.54E+01 - 1.56E+02	9.64E+04	NA	No	NA	NA	No	NUT
	7440-28-0	Thallium	5.17E+00	J	5.17E+00	J	MG/KG	VWW06-SD005	1 / 7	2.90E+00 - 5.32E+00	1.69E+00	NA	No	NA	NA	No	NBAC
	7440-62-2	Vanadium	1.76E+01	J	6.61E+01	J	MG/KG	VWW06-SD009	7 / 7	1.36E+00 - 2.50E+00	7.17E+01	NA	No	NA	NA	No	NBAC
	7440-66-6	Zinc	2.54E+01	J	8.49E+02	J	MG/KG	VWW06-SD009	7 / 7	2.82E+00 - 5.17E+00	8.73E+01	NA	Yes	NA	NA	Yes	BAC
	72-54-8	4,4'-DDD	2.80E-03	J	5.90E-02	J	MG/KG	VWW06-SD003	6 / 7	1.30E-03 - 2.50E-03	NA	6.02E+00	Yes	NA	NA	Yes	BAC
	72-55-9	4,4'-DDE	5.90E-03	J	9.40E-02	J	MG/KG	VWW06-SD003	6 / 7	6.90E-04 - 1.30E-03	NA	6.51E+00	Yes	NA	NA	Yes	BAC
	50-29-3	4,4'-DDT	3.20E-03	J	3.20E-03	J	MG/KG	VWW06-SD003	1 / 7	9.80E-04 - 1.90E-03	NA	6.91E+00	Yes	NA	NA	Yes	BAC
	11097-69-1	Aroclor-1254	3.00E-02	J	2.60E-01	J	MG/KG	VWW06-SD009	5 / 7	1.20E-02 - 2.30E-02	NA	6.79E+00	Yes	NA	NA	Yes	BAC
	83-32-9	Acenaphthene	1.19E-02	J	1.19E-02	J	MG/KG	VWW06-SD004	1 / 7	2.00E-03 - 1.66E-02	NA	3.92E+00	No	NA	NA	No	NBAC
	208-96-8	Acenaphthylene	2.00E-02	J	2.00E-02	J	MG/KG	VWW06-SD006	1 / 7	2.00E-03 - 1.66E-02	NA	3.94E+00	No	NA	NA	No	NBAC
	120-12-7	Anthracene	1.88E-02	J	2.82E-02		MG/KG	VWW06-SD004	2 / 7	2.00E-03 - 1.66E-02	NA	4.45E+00	No	NA	NA	No	NBAC
	56-55-3	Benzo(a)anthracene	4.70E-03	J	1.02E-01	J	MG/KG	VWW06-SD006	7 / 7	2.10E-03 - 1.74E-02	NA	5.76E+00	No	NA	NA	No	NBAC
	50-32-8	Benzo(a)pyrene	6.70E-03	J	1.10E-01	J	MG/KG	VWW06-SD006	7 / 7	2.80E-03 - 2.24E-02	NA	6.13E+00	No	NA	NA	No	NBAC
	205-99-2	Benzo(b)fluoranthene	1.07E-02	J	1.60E-01	J	MG/KG	VWW06-SD006	7 / 7	2.90E-03 - 2.37E-02	NA	5.78E+00	No	NA	NA	No	NBAC
	191-24-2	Benzo(g,h,i)perylene	3.88E-02		6.22E-02	J	MG/KG	VWW06-SD006	4 / 7	4.70E-03 - 3.86E-02	NA	6.63E+00	No	NA	NA	No	NBAC
	207-08-9	Benzo(k)fluoranthene	4.20E-03	J	6.34E-02	J	MG/KG	VWW06-SD006	7 / 7	3.20E-03 - 2.62E-02	NA	6.11E+00	No	NA	NA	No	NBAC
	218-01-9	Chrysene	6.80E-03	J	9.24E-02	J	MG/KG	VWW06-SD006	7 / 7	2.00E-03 - 1.62E-02	NA	5.81E+00	No	NA	NA	No	NBAC
	206-44-0	Fluoranthene	8.50E-03	J	1.22E-01	J	MG/KG	VWW06-SD006	7 / 7	2.00E-03 - 1.66E-02	NA	5.16E+00	No	NA	NA	No	NBAC
	86-73-7	Fluorene	1.16E-02	J	1.16E-02	J	MG/KG	VWW06-SD004	1 / 7	2.00E-03 - 1.66E-02	NA	4.18E+00	No	NA	NA	No	NBAC
	193-39-5	Indeno(1,2,3-cd)pyrene	3.49E-02		6.14E-02	J	MG/KG	VWW06-SD006	4 / 7	4.60E-03 - 3.74E-02	NA	6.70E+00	No	NA	NA	No	NBAC
	85-01-8	Phenanthrene	8.70E-03	J	1.11E-01		MG/KG	VWW06-SD004	6 / 7	2.00E-03 - 1.66E-02	NA	4.46E+00	No	NA	NA	No	NBAC
	129-00-0	Pyrene	7.30E-03	J	1.25E-01		MG/KG	VWW06-SD004	7 / 7	2.00E-03 - 1.66E-02	NA	4.88E+00	No	NA	NA	No	NBAC
	78-93-3	2-Butanone	5.60E-03	J	4.73E-02	J	MG/KG	VWW06-SD009	6 / 7	2.00E-03 - 4.90E-03	NA	2.90E-01	No	NA	NA	No	NBAC
	67-64-1	Acetone	2.96E-02	J	1.58E-01	J	MG/KG	VWW06-SD009	7 / 7	1.80E-03 - 4.60E-03	NA	-2.40E-01	No	NA	NA	No	NBAC
	75-15-0	Carbon disulfide	3.40E-03	J	1.30E-02	J	MG/KG	VWW06-SD009	3 / 7	2.10E-03 - 5.20E-03	NA	1.94E+00	No	NA	NA	No	NBAC
	127-18-4	Tetrachloroethene	1.60E-03	J	2.80E-03	J	MG/KG	VWW06-SD003	5 / 7	1.30E-03 - 3.20E-03	NA	3.40E+00	Yes	NA	NA	Yes	BAC
	18540-29-9	Chromium (hexavalent)	1.92E+00	J	1.20E+01	J	MG/KG	VWW06-SD009	5 / 7	3.87E-01 - 7.93E-01	2.19E+02	NA	Yes	NA	NA	No	BKG

TABLE 2.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Fish/Blue Crab (Fish Consumer/Crab Consumer)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Background Value (1)	Screening Toxicity Value (2)	Bioaccumulative (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)

(1) Background values are the 95 percent upper confidence limit of the 95th percentile (95/95 UTL) and were calculated using .

(2) Kow values (Oak Ridge National Laboratory, 2012). Available online: http://rais.ornl.gov/cgi-bin/tools/TOX_search

(3) Organic chemicals (except PAHs) considered bioaccumulative if Kow exceeded 3 and inorganic chemicals considered bioaccumulative according to EPA's Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs (EPA, 2000). According to the Toxicological Profile for Polycyclic Aromatic Hydrocarbons (ATSDR, 1995), PAHs are readily metabolized by fish and are not expected to bioaccumulate in fish tissue.

(4) Rationale Codes

Selection Reason: Bioaccumulative (BAC)
Deletion Reason: Not Bioaccumulative (NBAC)
Essential Nutrient (NUT)
Below Background (BKG)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
NA = Not available or not applicable
J = analyte was detected below the reporting limit in the sample
ATSDR = Agency for Toxic Substances and Disease Registry
PAH = Polycyclic Aromatic Hydrocarbons

TABLE 2.7
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water/Sediment
Exposure Medium: Fish (Fish Consumer)

Exposure Point	CAS Number	Chemical (1)	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Fish	7439-92-1	Lead	5.50E-02	1.65E+00 J	mg/kg	VWW06-FS03-0212	4 / 4	0.004 - 0.004	NA	2.00E-02	NA --	NA	NA	YES	--
	7440-66-6	Zinc	1.08E+01	1.69E+01 J	mg/kg	VWW06-FS01-0112	4 / 4	0.26 - 0.28	NA	1.64E+01	NA --	NA	NA	YES	--
	--	Dioxin-Like PCBs (upper bound)	6.94E-01	1.97E+01	pg/g	VWW06-FS03-0212	4 / 4	--	NA	1.32E-01	NA --	NA	NA	YES	--
	--	Dioxin-Like PCBs (lower bound)	6.65E-01	1.75E+01	pg/g	VWW06-FS03-0212	4 / 4	--	NA	2.94E-03	NA --	NA	NA	YES	--
	--	Non Dioxin-Like PCBs	3.36E+04	6.64E+05	pg/g	VWW06-FS03-0212	4 / 4	--	NA	1.17E+03	NA --	NA	NA	YES	--

(1) Dioxin-Like PCBs (upper bound) estimate used reported non-detected values in the dioxin toxicity equivalent (TEQ) calculations.
Dioxin-Like PCBs (lower bound) estimate substituted zero for non-detected values in the dioxin TEQ calculations.
Concentrations for non-dioxin-like PCBs were calculated as follows:
Non-dioxin-like PCBs = Sum of all PCB congener concentrations - Sum of dioxin-like PCB congener concentrations.

(2) Background values are the maximum detected concentrations.

(3) Due to the lack of appropriate screening values, chemicals were identified as chemical of potential concern (COPCs) if detected.

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

NA = Not available
J = analyte was detected below the reporting limit in the sample

TABLE 2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water/Sediment
Exposure Medium: Blue Crab (Crab Consumer)

Exposure Point	CAS Number	Chemical (1)	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Blue Crab	7439-92-1	Lead	2.07E+00	5.14E+00	mg/kg	VWW06-CRB01-0112	4 / 4	0.004 - 0.004	NA	6.60E-02	NA	--	NA	NA	YES	--
	7440-66-6	Zinc	1.93E+01	2.66E+01	mg/kg	VWW06-CRB04-0112	4 / 4	0.26 - 0.29	NA	2.07E+01	NA	--	NA	NA	YES	--
	--	Dioxin-Like PCBs (upper bound)	7.42E-01	2.02E+00	pg/g	VWW06-CRB03-0112	4 / 4	--	NA	2.94E-01	NA	--	NA	NA	YES	--
	--	Dioxin-Like PCBs (lower bound)	7.13E-01	1.99E+00	pg/g	VWW06-CRB03-0112	4 / 4	--	NA	2.65E-01	NA	--	NA	NA	YES	--
	--	Non Dioxin-Like PCBs	1.56E+04	6.24E+04	pg/g	VWW06-CRB01P-0112	4 / 4	--	NA	1.17E+04	NA	--	NA	NA	YES	--

(1) Dioxin-Like PCBs (upper bound) estimate used reported non-detected values in the dioxin toxicity equivalent (TEQ) calculations.
Dioxin-Like PCBs (lower bound) estimate substituted zero for non-detected values in the dioxin TEQ calculations.
Concentrations for non-dioxin-like PCBs were calculated as follows:
Non-dioxin-like PCBs = Sum of all PCB congener concentrations - Sum of dioxin-like PCB congener concentrations.

(2) Background values are the maximum detected concentrations.

(3) Due to the lack of appropriate screening values, chemicals were identified as chemical of potential concern (COPCs) if detected.

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

NA = Not available
J = analyte was detected below the reporting limit in the sample

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
North Area Surface Soil (0 - 6 inches)	Aluminum	mg/kg	NA	NA	1.6E+04		1.6E+04	mg/kg	Maximum Detected Concentration	(1)
	Arsenic	mg/kg	NA	NA	1.8E+00		1.8E+00	mg/kg	Maximum Detected Concentration	(1)
	Cobalt	mg/kg	NA	NA	1.7E+01		1.7E+01	mg/kg	Maximum Detected Concentration	(1)
	Iron	mg/kg	NA	NA	3.2E+04		3.2E+04	mg/kg	Maximum Detected Concentration	(1)
	Manganese	mg/kg	NA	NA	9.6E+02		9.6E+02	mg/kg	Maximum Detected Concentration	(1)
	Vanadium	mg/kg	NA	NA	1.1E+02		1.1E+02	mg/kg	Maximum Detected Concentration	(1)
	Aroclor-1254	mg/kg	NA	NA	1.2E-01	J	1.2E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(a)pyrene	mg/kg	NA	NA	1.2E-01		1.2E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(b)fluoranthene	mg/kg	NA	NA	2.1E-01		2.1E-01	mg/kg	Maximum Detected Concentration	(1)
	Chromium (hexavalent)	mg/kg	NA	NA	2.4E+00	J	2.4E+00	mg/kg	Maximum Detected Concentration	(1)

(1) The maximum detected concentration was used for this chemical because there were less than 8 total samples.

mg/kg= milligrams/kilograms
J = analyte was detected below the reporting limit in the sample
NA = Not applicable

TABLE 3.1.RME Supplement A
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)
Medium: Soil
Exposure Medium: Ambient Air

Exposure Point	Chemical of Potential Concern	Exposure Point Concentration in Soil		Exposure Point Concentration in Ambient Air	
		Value (1)	Units	Value (2)	Units
North Area Emissions from Surface Soil	Aluminum	1.6E+04	mg/kg	1.71E-05	mg/m^3
	Arsenic	1.8E+00	mg/kg	1.90E-09	mg/m^3
	Cobalt	1.7E+01	mg/kg	1.74E-08	mg/m^3
	Iron	3.2E+04	mg/kg	3.39E-05	mg/m^3
	Manganese	9.6E+02	mg/kg	1.01E-06	mg/m^3
	Vanadium	1.1E+02	mg/kg	1.14E-07	mg/m^3
	Aroclor-1254	1.2E-01	mg/kg	1.26E-10	mg/m^3
	Benzo(a)pyrene	1.2E-01	mg/kg	1.29E-10	mg/m^3
	Benzo(b)fluoranthene	2.1E-01	mg/kg	2.24E-10	mg/m^3
	Chromium (hexavalent)	2.4E+00	mg/kg	2.51E-09	mg/m^3

(1) Selection of exposure point concentrations presented on Table 3.1.RME.

(2) Ambient air exposure point concentration calculated using a Particulate Emission Factor (PEF) of 9.49×10^8 m^3/kg as shown below; derivation of PEF is presented on Table 4 Supplement C-1.

Concentration in ambient air (mg/m^3) = Concentration in soil (mg/kg) x [1/PEF (m^3/kg)]

mg/kg= milligrams/kilogram
mg/m^3 = milligram per cubic meter

TABLE 3.1a.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future (Maintenance Worker/Industrial Worker/Construction Worker)
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
North Area Surface Soil (0 - 6 inches)	Arsenic	mg/kg	NA	NA	1.8E+00	1.8E+00	mg/kg	Maximum Detected Concentration	(1)

(1) The maximum detected concentration was used for this chemical because there were less than 8 total samples.

mg/kg= milligrams/kilograms
J = analyte was detected below the reporting limit in the sample
NA = Not applicable

TABLE 3.1a.RME Supplement A
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future (Maintenance Worker/Industrial Worker/Construction Worker)
Medium: Soil
Exposure Medium: Ambient Air

Exposure Point	Chemical of Potential Concern	Exposure Point Concentration in Soil		Exposure Point Concentration in Ambient Air		
		Value (1)	Units	Value (2)	Value (3)	Units
North Area Emissions from Surface Soil	Arsenic	1.8E+00	mg/kg	1.90E-09	1.62E-07	mg/m^3

(1) Selection of exposure point concentrations presented on Table 3.1.RME.

(2) For industrial workers and maintenance workers, ambient air exposure point concentration calculated using a Particulate Emission Factor (PEF) of 9.49×10^8 m^3/kg as shown below. Derivation of PEF is presented on Table 4 Supplement C-1.

(3) For construction workers, ambient air exposure point concentration calculated using a Particulate Emission Factor (PEF) of 1.11×10^7 m^3/kg as shown below. Derivation of PEF is presented on Table 4 Supplement C-2.

Concentration in ambient air (mg/m^3) = Concentration in soil (mg/kg) x [1/PEF (m^3/kg)]

mg/kg= milligrams/kilogram
mg/m^3 = milligram per cubic meter

TABLE 3.2.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water (Recreational User/Trespasser/Site Visitor)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	Antimony	ug/L	NA	NA	1.0E+01	J	1.0E+01	ug/L	Maximum Detected Concentration	(1)
	Cadmium	ug/L	NA	NA	1.6E+01	J	1.6E+01	ug/L	Maximum Detected Concentration	(1)
	Thallium	ug/L	NA	NA	1.2E+02	J	1.2E+02	ug/L	Maximum Detected Concentration	(1)
	Chromium (hexavalent)	ug/L	NA	NA	4.1E+01	J	4.1E+01	ug/L	Maximum Detected Concentration	(1)

(1) The maximum detected concentration was used for this chemical because there were less than 8 total samples.

ug/L= micrograms/liter
J = analyte was detected below the reporting limit in the sample
NA = Not applicable

TABLE 3.3.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment (Recreational User/Trespasser/Site Visitor)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (N/T/G)	Maximum Concentration (Qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Sediment	Aluminum	mg/kg	NA	NA	1.4E+04	J	1.4E+04	mg/kg	Maximum Detected Concentration	(1)
	Antimony	mg/kg	NA	NA	3.9E+00	J	3.9E+00	mg/kg	Maximum Detected Concentration	(1)
	Arsenic	mg/kg	NA	NA	7.8E+00	J	7.8E+00	mg/kg	Maximum Detected Concentration	(1)
	Cobalt	mg/kg	NA	NA	9.0E+00	J	9.0E+00	mg/kg	Maximum Detected Concentration	(1)
	Iron	mg/kg	NA	NA	4.6E+04	J	4.6E+04	mg/kg	Maximum Detected Concentration	(1)
	Lead	mg/kg	2.3E+02	NA	6.1E+02	J	2.3E+02	mg/kg	Mean Detected Concentration	(2)
	Manganese	mg/kg	NA	NA	3.6E+02	J	3.6E+02	mg/kg	Maximum Detected Concentration	(1)
	Thallium	mg/kg	NA	NA	5.2E+00	J	5.2E+00	mg/kg	Maximum Detected Concentration	(1)
	Vanadium	mg/kg	NA	NA	6.6E+01	J	6.6E+01	mg/kg	Maximum Detected Concentration	(1)
	Aroclor-1254	mg/kg	NA	NA	2.6E-01	J	2.6E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(a)pyrene	mg/kg	NA	NA	1.1E-01	J	1.1E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(b)fluoranthene	mg/kg	NA	NA	1.6E-01	J	1.6E-01	mg/kg	Maximum Detected Concentration	(1)
	Chromium (hexavalent)	mg/kg	NA	NA	1.2E+01	J	1.2E+01	mg/kg	Maximum Detected Concentration	(1)

(1) The maximum detected concentration was used for this chemical because there were less than 8 total samples.
(2) The mean detected concentration is used for lead.

mg/kg= milligrams/kilograms
J = analyte was detected below the reporting limit in the sample
NA = Not applicable

TABLE 3.4.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Fish/Blue Crab (Fish Consumer/Crab Consumer)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Lagoon	Thallium	ug/L	NA	NA	1.2E+02 J	1.2E+02	ug/L	Maximum Detected Concentration	(1)

(1) The maximum detected concentration was used for this chemical because there were less than 8 total samples.

ug/L= micrograms/liter
J = analyte was detected below the reporting limit in the sample
NA = Not applicable

TABLE 3.4.RME Supplement A
BIOACCUMULATION AND BIOCONCENTRATION FACTORS FOR COPCS IN SURFACE WATER
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

CAS Number	COPC	BCF Value (L-sw/kg-biota)	BCF Source	Surface Water EPC (mg/L-sw) (1)	Fish/Crab EPC (mg/kg-biota)
7440-28-0	Thallium	1.2E+02	EPA, 2002	1.2E-01	1.4E+01

Notes:

(1) Surface water EPCs are presented in Table 3.4.

BCF - bioconcentration factor
COPC - chemical of potential concern
EPC - exposure point concentration
NA - not available / not applicable

Sources:

EPA, 2002: National Recommended Water Quality Criteria: 2002 Human Health Criteria Calculation Matrix. November 2002.

TABLE 3.5.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Fish/Blue Crab (Fish Consumer/Crab Consumer)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Lagoon	Cadmium	mg/kg	NA	NA	5.7E+00	J	5.7E+00	mg/kg	Maximum Detected Concentration	(1)
	Chromium	mg/kg	NA	NA	3.7E+01	J	3.7E+01	mg/kg	Maximum Detected Concentration	(1)
	Copper	mg/kg	NA	NA	2.0E+02	J	2.0E+02	mg/kg	Maximum Detected Concentration	(1)
	Lead	mg/kg	2.34E+02	NA	6.1E+02	J	2.3E+02	mg/kg	Mean Detected Concentration	(2)
	Nickel	mg/kg	NA	NA	1.9E+01	J	1.9E+01	mg/kg	Maximum Detected Concentration	(1)
	Silver	mg/kg	NA	NA	3.0E-01	J	3.0E-01	mg/kg	Maximum Detected Concentration	(1)
	Zinc	mg/kg	NA	NA	8.5E+02	J	8.5E+02	mg/kg	Maximum Detected Concentration	(1)
	4,4'-DDD	mg/kg	NA	NA	5.9E-02	J	5.9E-02	mg/kg	Maximum Detected Concentration	(1)
	4,4'-DDE	mg/kg	NA	NA	9.4E-02	J	9.4E-02	mg/kg	Maximum Detected Concentration	(1)
	4,4'-DDT	mg/kg	NA	NA	3.2E-03	J	3.2E-03	mg/kg	Maximum Detected Concentration	(1)
	Aroclor-1254	mg/kg	NA	NA	2.6E-01	J	2.6E-01	mg/kg	Maximum Detected Concentration	(1)
	Tetrachloroethene	mg/kg	NA	NA	2.8E-03	J	2.8E-03	mg/kg	Maximum Detected Concentration	(1)

(1) The maximum detected concentration was used for this chemical because there were less than 8 total samples.
(2) The mean detected concentration is used for lead.

mg/kg= milligrams/kilograms
J = analyte was detected below the reporting limit in the sample
NA = Not applicable

TABLE 3.5.RME Supplement A
BIOTA-TO-SEDIMENT ACCUMULATION FACTORS FOR COPCS IN SEDIMENT
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

					Fish					Crab				
CAS Number	**COPC (1)**	**Log Kow**	**Log Kow Reference**	**Sediment EPC (2) (mg/kg-sediment)**	**BSAF (3) Value Unitless**	**Organism Used for Deriving BSAF**	**Tissue Used for Deriving BSAF**	**BSAF Reference**	**Fish EPC (6) (mg/kg-biota)**	**BSAF (3) Value Unitless**	**Organism Used for Deriving BSAF**	**Tissue Used for Deriving BSAF**	**BSAF Reference**	**Crab EPC (6) (mg/kg-biota)**
7440-43-9	**Cadmium**	**NA**	**NA**	**5.7E+00**	**1.8E-01**	**Carnivorous, Omnivorous, and Herbivorous Fish**	**Whole body**	**WDE, 1995**	**2.6E-01**	**1.8E-01**	**Carnivorous, Omnivorous, and Herbivorous Fish**	**Whole body**	**WDE, 1995**	**2.6E-01**
7440-47-3	**Chromium**	**NA**	**NA**	**3.7E+01**	**4.3E-02**	**Fish (Perca flavescens)**	**Whole body**	**WDE, 1995**	**4.0E-01**	**4.3E-02**	**Fish (Perca flavescens)**	**Whole body**	**WDE, 1995**	**4.0E-01**
7440-50-8	**Copper**	**NA**	**NA**	**2.0E+02**	**1.4E-01**	**Crustacean (Cancer magister)**	**Whole body**	**WDE, 1995**	**7.1E+00**	**1.4E-01**	**Crustacean (Cancer magister)**	**Whole body**	**WDE, 1995**	**7.1E+00**
7439-92-1	**Lead**	**NA**	**NA**	**2.3E+02**	**1.6E-01**	**Carnivorous, Omnivorous, and Herbivorous Fish**	**Whole body**	**WDE, 1995**	**9.3E+00**	**1.6E-01**	**Carnivorous, Omnivorous, and Herbivorous Fish**	**Whole body**	**WDE, 1995**	**9.3E+00**
7440-02-0	Nickel	NA	NA	1.9E+01	1.0E+00	--	--	(4)	4.8E+00	1.0E+00	--	--	(4)	4.8E+00
7440-22-4	Silver	NA	NA	3.0E-01	1.0E+00	--	--	(4)	7.4E-02	1.0E+00	--	--	(4)	7.4E-02
7440-66-6	Zinc	NA	NA	8.5E+02	1.3E+00	Carnivorous, Omnivorous, and Herbivorous Fish	Whole body	WDE, 1995	2.8E+02	1.3E+00	Carnivorous, Omnivorous, and Herbivorous Fish	Whole body	WDE, 1995	2.8E+02
72-54-8	4,4'-DDD	6.0E+00	ORNL, 2012	5.9E-02	2.5E-01	Cunner (Tautogolabrus adspersus)	Whole body	EPA, 2008	8.9E-03	3.0E+00	Burrowing Crab (Chasmagnathus granulata)	Whole body	USACE, 2009	8.0E-02
72-55-9	4,4'-DDE	6.5E+00	ORNL, 2012	9.4E-02	1.4E+01	Average of consumed salt water species	Whole body	EPA, 2008	8.1E-01	3.2E+01	Burrowing Crab (Chasmagnathus granulata)	Whole body	USACE, 2009	1.4E+00
50-29-3	4,4'-DDT	6.9E+00	ORNL, 2012	3.2E-03	2.3E-01	Cunner (Tautogolabrus adspersus)	Whole body	EPA, 2008	4.4E-04	2.2E+00	Burrowing Crab (Chasmagnathus granulata)	Whole body	USACE, 2009	3.2E-03
11097-69-1	Aroclor-1254	6.8E+00	ORNL, 2012	2.6E-01	4.6E+00	Average of consumed salt water species	Whole body	EPA, 2008	7.1E-01	4.6E+00	Blue crab (Callinectes sapidus)	Whole body	EPA, 2008 (5)	5.4E-01
127-18-4	Tetrachloroethene	3.4E+00	ORNL, 2012	2.8E-03	1.0E+00	--	--	(4)	1.7E-03	1.0E+00	--	--	(4)	1.3E-03

Notes:
(1) COPCs identified for sediment are presented in Table 2.4.
(2) Sediment EPCs are presented in Table 3.5.
(3) BSAFs for metals are presented in kg-sed[dw]/kg-biota [dw]; BSAFs for organics are presented in kg-OC[dw]/kg-lipid[dw].
(4) A default value of 1 was assumed if no BSAF was available.
(5) Total PCBs were used to represent Aroclor-1254.
(6) Fish/Crab EPCs were calculated using the following equations:

Metals: Fish/Crab EPC (mg/kg-biota [ww]) = Sed EPC (mg/kg-sed [dw]) x BSAF (kg-sed [dw]/kg-biota [dw]) x 0.25 (kg-biota [dw]/kg-biota [ww]).
Organics: Fish/Crab EPC (mg/kg-biota [ww]) = Sed EPC (mg/kg-sed [dw]) x lipid normalized BSAF (kg-OC [dw]/kg-lipid [dw]) x (%lipid / %OC) x 0.25 (kg-biota [dw]/kg-biota [ww]).
Fish/Crab EPCs were calculated assuming 2.1% organic carbon (site-specific) in sediment and 5% lipid for fish (EPA, 2000), 3.8% lipid for crab (USACE, 2009), and 75% moisture in fish/crab (EPA, 1993).

COPC - chemical of potential concern
EPC - exposure point concentration
BSAF - biota-sediment accumulation factor
OC - organic carbon
Kow - octanol/water partition coefficient

ORNL - Oak Ridge National Laboratory
USACE - United States Army Corps of Engineers
WDE - Washington Department of Ecology
NA - not available / not applicable

dw - dry weight basis
ww -wet weight basis

Sources:

EPA, 1993. Wildlife exposure factors handbook. Volume I of II. EPA/600/R-93/187a

EPA, 2000. Bioaccumulation testing and interpretation for the purpose of sediment quality assessment - status and needs. EPA/823/R-00/001.

EPA, 2008. Biota-Sediment Accumulation Factor Data Set, Version 1.0. Prepared for the U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Mid-Continent Ecology Division (MED), Duluth, Minnesota. Prepared Computer Sciences Corporation Duluth, Minnesota Contract 68 W-02 032, Task 5003 and 5004. January 2008.
http://www.epa.gov/med/Prods_Pubs/bsaf.htm
Oak Ridge National Laboratory (ORNL), 2012. Risk Assessment Information System. URL: http://rais.ornl.gov/cgi-bin/tools/TOX_search
United States Army Corps of Engineers (USACE), 2009. BSAF Database. Available online: http://el.erdc.usace.army.mil/bsafnew/bsaf.html
Washington Department of Ecology (WDE), 1995. Bioaccumulation Factor Approach Analysis for Metals and Polar Organic Compounds.

TABLE 3.6.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water/Sediment
Exposure Medium: Fish (Fish Consumer)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Lagoon	Lead	mg/kg	NA	NA	1.7E+00	J	5.2E-01	mg/kg	Mean Detected Concentration	(1)
	Zinc	mg/kg	NA	NA	1.7E+01	J	1.7E+01	mg/kg	Maximum Detected Concentration	(2)
	Dioxin-Like PCBs (upper bound)	pg/g	NA	NA	2.0E+01		2.0E+01	pg/g	Maximum Detected Concentration	(2)
	Dioxin-Like PCBs (lower bound)	pg/g	NA	NA	1.8E+01		1.8E+01	pg/g	Maximum Detected Concentration	(2)
	Non Dioxin-Like PCBs	pg/g	NA	NA	6.6E+05		6.6E+05	pg/g	Maximum Detected Concentration	(2)

(1) The mean detected concentration is used for lead.
(2) The maximum detected concentration was used for this chemical because there were less than 8 total samples.

J = analyte was detected below the reporting limit in the sample
NA = Not applicable

TABLE 3.7.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water/Sediment
Exposure Medium: Blue Crab (Crab Consumer)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Lagoon	Lead	mg/kg	NA	NA	5.1E+00	3.2E+00	mg/kg	Mean Detected Concentration	(1)
	Zinc	mg/kg	NA	NA	2.7E+01	2.7E+01	mg/kg	Maximum Detected Concentration	(2)
	Dioxin-Like PCBs (upper bound)	pg/g	NA	NA	2.0E+00	2.0E+00	pg/g	Maximum Detected Concentration	(2)
	Dioxin-Like PCBs (lower bound)	pg/g	NA	NA	2.0E+00	2.0E+00	pg/g	Maximum Detected Concentration	(2)
	Non Dioxin-Like PCBs	pg/g	NA	NA	6.2E+04	6.2E+04	pg/g	Maximum Detected Concentration	(2)

(1) The mean detected concentration is used for lead.
(2) The maximum detected concentration was used for this chemical because there were less than 8 total samples.

NA = Not applicable

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User/ Trespasser/ Site Visitor	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
		Youth	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	39	kg	EPA 2004 (2)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
		Child	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
Dermal	Recreational User/ Trespasser/ Site Visitor	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2004 (5)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Recreational User/ Trespasser/ Site Visitor (cont.)	Youth	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,100	cm^2	EPA, 2004 (5)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	EPA, 1991	
				BW	Body Weight	39	kg	EPA 2004 (2)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
		Child	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2004 (6)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	

Notes:

(1) Based on best professional judgment.

(2) Youths from 6 to 16 years of age. Body weight is average of the mean values for boys and girls for the ages 6 through 16.

(3) Calculated as the product of ED (years) x 365 days/year.

(4) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

(5) SA includes head, hands, forearms, and lower legs.

(6) SA includes head, hands, forearms, lower legs, and feet.

Sources:

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

cm^2 = Square centimeter

kg = Kilogram

kg/mg = Kilogram per milligram

mg/kg = Milligram per kilogram

mg/kg-day = Milligram per kilogram per day

mg/cm^2-day = Milligram per square centimeter per day

mg/day = Milligram per day

TABLE 4.1.RME Supplement A
VALUES USED FOR DAILY INTAKE CALCULATIONS (MUTAGENIC MODE OF ACTION)
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Route	Receptor Population	Exposure Point	Receptor Age		Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User/ Trespasser/ Site Visitor	North Area Surface Soil (0-6 inches)	Child	Child (0-<2 yrs)	CS IR-Sed-Adj (0-2) EF CF AT-C	Chemical Concentration in Soil Age Adjusted Ingestion Rate of Soil (0-<2 yrs) Exposure Frequency Conversion Factor Averaging Time (Cancer)	See Table 3s.RME 39.7 104 0.000001 25,550	mg/kg mg-yr/day-kg days/year kg/mg days	See Table 3s.RME calculated (1) - - (2)	Chronic Daily Intake (CDI) (mg/kg-day) = CS x IR-S-Adj (0-2) x EF x CF x 1/AT [for child aged 0-<2 years]
				Child (2-6 yrs)	CS IR-Sed-Adj (2-6) EF CF AT-C	Chemical Concentration in Soil Age Adjusted Ingestion Rate of Soil (2-<6 yrs) Exposure Frequency Conversion Factor Averaging Time (Cancer)	See Table 3s.RME 49.8 104 0.000001 25,550	mg/kg mg-yr/day-kg days/year kg/mg days	See Table 3s.RME calculated (1) - - (2)	CDI (mg/kg-day) = CS x IR-S-Adj (2-6) x EF x CF x 1/AT [for child aged 2-6 years]
Dermal	Recreational User/ Trespasser/ Site Visitor	North Area Surface Soil (0-6 inches)	Child	Child (0-<2 yrs)	CS SSAF-Adj (0-2) DABS CF EF AT-C	Chemical Concentration in Soil Age Adjusted Sediment to Skin Adherence Factor (0-<2 yrs) Dermal Absorption Factor Solids Conversion Factor Exposure Frequency Averaging Time (Cancer)	See Table 3s.RME 103 chemical-Specific 0.000001 104 25,550	mg/kg mg-yr/day-kg -- kg/mg days/year days	See Table 3s.RME calculated EPA, 2004 - - (1) (2)	CDI (mg/kg-day) = CS x SSAF-Adj (0-2) x DABS x CF x EF x 1/AT [for child aged 0-<2 years]
				Child (2-6 yrs)	CS SSAF-Adj (2-6) DABS CF EF AT-C	Chemical Concentration in Soil Age Adjusted Sediment to Skin Adherence Factor (2-<6 yrs) Dermal Absorption Factor Solids Conversion Factor Exposure Frequency Averaging Time (Cancer)	See Table 3s.RME 144 chemical-Specific 0.000001 104 25,550	mg/kg mg-yr/day-kg -- kg/mg days/year days	See Table 3s.RME calculated EPA, 2004 - - (1) (2)	CDI (mg/kg-day) = CS x SSAF-Adj (2-6) x DABS x CF x EF x 1/AT [for child aged 2-6 years]

Notes:
(1) Based on best professional judgment.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

Sources:
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

cm^2 = Square centimeter
kg = Kilogram
kg/mg = Kilogram per milligram
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
mg/cm^2-day = Milligram per square centimeter per day
mg/day = Milligram per day

TABLE 4.2.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Ambient Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User/ Trespasser/ Site Visitor	Adult	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	
				ET	Exposure Time	4	hr/day	(1)	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
				CF	Conversion Factor	1/24	day/hr	- -	
		Youth	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	
				ET	Exposure Time	4	hr/day	(1)	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
				CF	Conversion Factor	1/24	day/hr	- -	
		Child	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	
				ET	Exposure Time	4	hr/day	(1)	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
				CF	Conversion Factor	1/24	day/hr	- -	

Notes:
(1) Based on best professional judgment.
(2) Calculated as the product of ED (years) x 365 days/year.
(3) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

Sources:
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

mg/kg = Milligram per kilogram
mg/m^3 = Milligram per cubic meter
m^3/kg = Cubic meter per kilogram

TABLE 4.2.RME Supplement A

VALUES USED FOR DAILY INTAKE CALCULATIONS (MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Ambient Air

Exposure Route	Receptor Population	Exposure Point	Receptor Age		Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User/ Trespasser/ Site Visitor	North Area Emissions from Surface Soil	Child	Child (0-<2 yrs)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Exposure Concentration (EC)(mg/m^3)=
					CA	Chemical Concentration in Air	calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
					ET	Exposure Time	4	hours/day	(1)	[for child aged 0-<2 years]
					ED	Exposure Duration	2	years	EPA, 2002	
					PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	CA (mg/m^3) = CS (1/PEF)
					EF	Exposure Frequency	104	days/year	(1)	
					AT-C	Averaging Time (Cancer)	25,550	days	(2)	
					CF	Conversion Factor	1/24	day/hours	--	
				Child (2-6 yrs)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3)=
					CA	Chemical Concentration in Air	calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
					ET	Exposure Time	4	hours/day	(1)	[for child aged 2-6 years]
					ED	Exposure Duration	4	Years	EPA, 2002	
					PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	CA (mg/m^3) = CS (1/PEF)
					EF	Exposure Frequency	104	days/year	(1)	
					AT-C	Averaging Time (Cancer)	25,550	days	(2)	
					CF	Conversion Factor	1/24	day/hours	--	

Notes:

(1) Based on best professional judgment.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 1989a) x 365 days/year.

Sources:

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

kg = Kilogram

mg/kg = Milligram per kilogram

mg/kg-day = Milligram per kilogram per day

mg/m^3 = Milligram per cubic meter

m^3/day = Cubic meter per day

m^3/kg = Cubic meter per kilogram

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User/ Trespasser/ Site Visitor	Adult	Surface Water	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-SW	Ingestion Rate of Surface Water	0.01	liters/hr	EPA, 1989 (1)	C-SW x IR-SW x ET x EF x ED x CF x
				ET	Exposure Time	4	hr/day	EPA, 1989	1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.001	mg/µg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
		Youth	Surface Water	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	CDI (mg/kg-day) =
				IR-SW	Ingestion Rate of Surface Water	0.01	liters/hr	EPA, 1989 (1)	C-SW x IR-SW x ET x EF x ED x CF x
				ET	Exposure Time	4	hr/day	EPA, 1989	1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(2)	
				ED	Exposure Duration	10	years	EPA, 1991	
				CF	Conversion Factor	0.001	mg/µg	- -	
				BW	Body Weight	39	kg	EPA 2004 (5)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
		Child	Surface Water	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	CDI (mg/kg-day) =
				IR-SW	Ingestion Rate of Surface Water	0.01	l/hour	EPA, 1989 (1)	C-SW x IR-SW x ET x EF x ED x CF x
				ET	Exposure Time	4	hr/day	EPA, 1989	1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(2)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF	Conversion Factor	0.001	mg/µg	- -	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational User/ Trespasser/ Site Visitor	Adult	Surface Water	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	Chemical specific	cm/hr	EPA, 2004	Inorganics: DAevent (mg/cm2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2004	Kp x C-SW x tevent x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2004	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2004	Organics :
				t_{event}	Event Time	4	hr/event		t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	18,000	cm^2	EPA, 2004	2 x FA x Kp x C-SW x (sqrt((6 x t x tevent)/p)) x CF1 x CF2
				EV	Event Frequency	1	events/day	EPA, 2004	
				EF	Exposure Frequency	104	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 2002	FA x Kp x C-SW x (tevent/(1+B) + 2 x t x
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	$((1 + 3B + 3B^2)/(1+B)^2)$) x CF1 x CF2
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	
		Youth	Surface Water	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	Chemical specific	cm/hr	EPA, 2004	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2004	Kp x C-SW x tevent x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2004	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2004	Organics :
				t_{event}	Event Time	4	hr/event		t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	12,346	cm^2	EPA, 1997, (6)	2 x FA x Kp x C-SW x (sqrt((6 x t x tevent)/p)) x CF1 x CF2
				EV	Event Frequency	1	events/day	EPA, 2004	
				EF	Exposure Frequency	104	days/year	(2)	
				ED	Exposure Duration	10	years	EPA, 1991	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	39	kg	EPA 2004 (5)	FA x Kp x C-SW x (tevent/(1+B) + 2 x t x
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	$((1 + 3B + 3B^2)/(1+B)^2)$) x CF1 x CF2
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Recreational User/ Trespasser/ Site Visitor (cont.)	Child	Surface Water	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	Chemical specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	Chemical specific	cm/hr	EPA, 2004	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	Chemical specific	hr/event	EPA, 2004	Kp x C-SW x tevent x CF1 x CF2
				t*	Time to Reach Steady-state	Chemical specific	hours	EPA, 2004	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical specific	dimensionless	EPA, 2004	Organics :
				t_{event}	Event Time	4	hr/day		t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,686	cm^2	EPA, 1997, (7)	2 x FA x Kp x C-SW x (sqrt((6 x t x tevent)/p)) x CF1 x CF2
				EV	Event Frequency	1	events/day	EPA, 2004	
				EF	Exposure Frequency	104	days/year	(2)	
				ED	Exposure Duration	6	years	EPA, 1991	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 2002	FA x Kp x C-SW x (tevent/(1+B) + 2 x t x
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	$((1 + 3B + 3B^2)/(1+B)^2)$) x CF1 x CF2
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) Based on wading. Water is not of sufficient depth for swimming.

(2) Based on best professional judgment.

(3) Calculated as the product of ED (years) x 365 days/year.

(4) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

(5) Youths from 6 to 16 years of age. Body weight is average of the mean values for boys and girls for the ages 6 through 16.

(6) Average total body surface area for males and females 6 to <16 years of age.

(7) Average total body surface area for males and females 1 to 6 years of age.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

TABLE 4.3.RME Supplement A

VALUES USED FOR DAILY INTAKE CALCULATIONS (MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Exposure Point	Receptor Age		Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User/ Trespasser/ Site Visitor	Surface Water	Child	Child (0-<2 yrs)	CSW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	CDI (mg/kg-day) =
					IR-SW-Adj	Age Adjusted Ingestion Rate of Surface Water (0-<2 yrs)	0.00198	l-yr/hour-kg	EPA, 1989 (1)	CSW x IR-SW-Adj (0-2) x ET x EF x CF1 x 1/AT
					ET	Exposure Time	4	hr/day	EPA, 1989	[for child aged 0-<2 years]
					EF	Exposure Frequency	104	days/year	(2)	
					CF1	Conversion Factor 1	0.001	mg/µg	- -	
					AT-C	Averaging Time (Cancer)	25,550	days	(3)	
				Child (2-6 yrs)	CSW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	CDI (mg/kg-day) =
					IR-SW-Adj	Age Adjusted Ingestion Rate of Surface Water (2-<6 yrs)	0.0025	l-yr/hour-kg	EPA, 1989 (1)	CSW x IR-SW-Adj (2-6) x ET x EF x CF1 x 1/AT
					ET	Exposure Time	4	hr/day	EPA, 1989	[for child aged 2-6 years]
					EF	Exposure Frequency	104	days/year	(2)	
					CF1	Conversion Factor 1	0.001	mg/µg	- -	
					AT-C	Averaging Time (Cancer)	25,550	days	(3)	
Dermal	Recreational User/ Trespasser/ Site Visitor	Surface Water	Child	Child (0-<2 yrs)	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	CDI (mg/kg-day) =
					DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA-Adj x EV x EF x 1/AT
					t_{event}	Event Time	4	hr/day	EPA, 1989	
					SA-Adj	Age Adjusted Skin Surface Area (0-<2 yrs)	1,172	cm^2-yr/kg	calculated	Inorganics: DAevent (mg/cm^2-event) =
					EV	Event Frequency	1	events/day	EPA, 2004	Kp x C-SW x tevent x CF1 x CF2
					EF	Exposure Frequency	104	days/year	(2)	
					AT-C	Averaging Time (Cancer)	25,550	days	(3)	Organics :
				Child (2-6 yrs)	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	µg/l	See Table 3s.RME	t_{event}<t*: DAevent (mg/cm^2-event) =
					DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	2 x FA x Kp x C-SW x (sqrt((6 x t x tevent)/p)) x CF1 x CF2
					t_{event}	Event Time	4	hr/day	EPA, 1989	
					SA-Adj	Age Adjusted Skin Surface Area (2-<6 yrs)	1,685	cm^2-yr/kg	calculated	t_{event}>t*: DAevent (mg/cm^2-event) =
					EV	Event Frequency	1	events/day	EPA, 2004	FA x Kp x C-SW x (tevent/(1+B) + 2 x t x
					EF	Exposure Frequency	104	days/year	(2)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
					AT-C	Averaging Time (Cancer)	25,550	days	(3)	
					FA	Fraction absorbed water	chemical-Specific	dimensionless	EPA, 2004	
					Kp	Permeability Coefficient	chemical-Specific	cm/hr	EPA, 2004	
					τ	Lag Time	chemical-Specific	hr/event	EPA, 2004	
					t*	Time to Reach Steady-state	chemical-Specific	hours	EPA, 2004	
					B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-Specific	dimensionless	EPA, 2004	
					CF1	Conversion Factor 1	0.001	mg/µg	- -	
					CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) Based on wading. Water is not of sufficient depth for swimming.

(2) Based on best professional judgment.

(3) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

TABLE 4.4.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User/ Trespasser/ Site Visitor	Adult	Sediment	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	EPA 2002	C-SED x IR-Sed x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
		Youth	Sediment	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	EPA 2002	C-SED x IR-Sed x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	39	kg	EPA 2004 (4)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
		Child	Sediment	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	EPA 2002	C-SED x IR-Sed x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	

TABLE 4.4.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational User/ Trespasser/ Site Visitor	Adult	Sediment	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2004 (5)	C-SED x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.36	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
		Youth	Sediment	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,100	cm^2	EPA, 2004 (5)	C-SED x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.36	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	EPA, 1991	
				BW	Body Weight	39	kg	EPA 2004 (4)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
		Child	Sediment	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2004 (6)	C-SED x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.36	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chemical specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	

(1) Based on best professional judgment.

(2) Calculated as the product of ED (years) x 365 days/year.

(3) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

(4) Youths from 6 to 16 years of age. Body weight is average of the mean values for boys and girls for the ages 6 through 16

(5) SA includes head, hands, forearms, and lower legs.

(6) SA includes head, hands, forearms, lower legs, and feet.

Sources:

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

EPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment (Final). EPA/540/R/99/005. July 2004.

TABLE 4.4.RME Supplement A
VALUES USED FOR DAILY INTAKE CALCULATIONS (MUTAGENIC MODE OF ACTION)
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Exposure Point	Receptor Age		Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User/ Trespasser/ Site Visitor	Sediment	Child	Child (0-<2 yrs)	C-SED IR-Sed-Adj (0-2) EF CF AT-C	Chemical Concentration in Sediment Age Adjusted Ingestion Rate of Sediment (0-<2 yrs) Exposure Frequency Conversion Factor Averaging Time (Cancer)	See Table 3s.RME 9.9 104 0.000001 25,550	mg/kg mg-yr/day-kg days/year kg/mg days	See Table 3s.RME calculated (1) - - (2)	Chronic Daily Intake (CDI) (mg/kg-day) = C-SED x IR-Sed-Adj (0-2) x EF x CF x 1/AT [for child aged 0-<2 years]
				Child (2-6 yrs)	C-SED IR-Sed-Adj (2-6) EF CF AT-C	Chemical Concentration in Sediment Age Adjusted Ingestion Rate of Sediment (2-<6 yrs) Exposure Frequency Conversion Factor Averaging Time (Cancer)	See Table 3s.RME 12.4 104 0.000001 25,550	mg/kg mg-yr/day-kg days/year kg/mg days	See Table 3s.RME calculated (1) - - (2)	CDI (mg/kg-day) = C-SED x IR-Sed-Adj (2-6) x EF x CF x 1/AT [for child aged 2-6 years]
Dermal	Recreational User/ Trespasser/ Site Visitor	Sediment	Child	Child (0-<2 yrs)	C-SED SSAF-Adj (0-2) DABS CF EF AT-C	Chemical Concentration in Sediment Age Adjusted Sediment to Skin Adherence Factor (0-<2 yrs) Dermal Absorption Factor Solids Conversion Factor Exposure Frequency Averaging Time (Cancer)	See Table 3s.RME 186 chemical-Specific 0.000001 104 25,550	mg/kg mg-yr/day-kg -- kg/mg days/year days	See Table 3s.RME calculated EPA, 2004 - - (1) (2)	CDI (mg/kg-day) = C-SED x SSAF-Adj (0-2) x DABS x CF x EF x 1/AT [for child aged 0-<2 years]
				Child (2-6 yrs)	C-SED SSAF-Adj (2-6) DABS CF EF AT-C	Chemical Concentration in Sediment Age Adjusted Sediment to Skin Adherence Factor(2-<6 yrs) Dermal Absorption Factor Solids Conversion Factor Exposure Frequency Averaging Time (Cancer)	See Table 3s.RME 259 chemical-Specific 0.000001 104 25,550	mg/kg mg-yr/day-kg -- kg/mg days/year days	See Table 3s.RME calculated EPA, 2004 - - (1) (2)	CDI (mg/kg-day) = C-SED x SSAF-Adj (2-6) x DABS x CF x EF x 1/AT [for child aged 2-6 years]

Notes:
(1) Based on best professional judgment.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

Sources:
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

cm^2 = Square centimeter
kg = Kilogram
kg/mg = Kilogram per milligram
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
mg/cm^2-day = Milligram per square centimeter per day
mg/day = Milligram per day

TABLE 4.5.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Fish/Blue Crab

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Fish/Blue Crab Consumer	Adult	Lagoon	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	mg/L-sw	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab Tissue	calculated	mg/kg-tissue	calculated (6)	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BCF	Bioconcentration Factor	chemical specific	L-sw/kg-tissue	chemical specific	
				BAF	Bioaccumulation Factor	chemical specific	L-sw/kg-tissue	chemical specific	Metals:
				IR-FC	Fish/Crab Ingestion Rate	0.227	kg-tissue/meal	EPA, 2000 (1)	C-CF = C-SW x BCF
				EF	Exposure Frequency	2	meals/week	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	Organic Chemicals:
				BW	Body Weight	70	kg	EPA, 1991	C-CF = C-SW x BAF
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor 1	52	weeks/year	- -	
		Youth	Lagoon	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	mg/L-sw	See Table 3s.RME	CDI (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab Tissue	calculated	mg/kg-tissue	calculated (6)	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BCF	Bioconcentration Factor	chemical specific	L-sw/kg-tissue	chemical specific	
				BAF	Bioaccumulation Factor	chemical specific	L-sw/kg-tissue	chemical specific	Metals:
				IR-FC	Fish/Crab Ingestion Rate	0.227	kg-tissue/meal	EPA, 2000 (1)	C-CF = C-SW x BCF
				EF	Exposure Frequency	2	meals/week	(2)	
				ED	Exposure Duration	10	years	EPA, 1991	Organic Chemicals:
				BW	Body Weight	39	kg	EPA, 1991	C-CF = C-SW x BAF
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor 1	52	weeks/year	- -	
		Child	Lagoon	C-SW	Chemical Concentration in Surface Water	See Table 3s.RME	mg/L-sw	See Table 3s.RME (1)	CDI (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab Tissue	calculated	mg/kg-tissue	calculated (6)	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BCF	Bioconcentration Factor	chemical specific	L-sw/kg-tissue	chemical specific	
				BAF	Bioaccumulation Factor	chemical specific	L-sw/kg-tissue	chemical specific	Metals:
				IR-FC	Fish/Crab Ingestion Rate	0.114	kg-tissue/meal	(5)	C-CF = C-SW x BCF
				EF	Exposure Frequency	2	meals/week	(2)	
				ED	Exposure Duration	6	years	EPA, 1991	Organic Chemicals:
				BW	Body Weight	15	kg	EPA, 1991	C-CF = C-SW x BAF
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor 1	52	weeks/year	- -	

TABLE 4.5.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Fish/Blue Crab

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:
(1) EPA's default fish/shellfish meal size of 8 oz for the general adult population.
(2) Site-specific value based on the location of the site within a National Wildlife Refuge, the relatively small size and shallowness of the SWMU 6 lagoon, and the availability of other, more appealing fishing spots proximal to populated areas.
(3) Calculated as the product of ED (years) x 365 days/year.
(4) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.
(5) One half the adult fish/blue crab meal size of 8 oz.
(6) For those chemicals whose measured concentrations are available in biological tissue samples, measured concentrations rather than modeled concentrations are used as EPCs.

Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2000. Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. Volume 2 Risk Assessment and Fish Consumption Limits Third Edition. Office of Water.

kg = Kilogram
sw = Surface water
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
L = Liter

TABLE 4.6.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Fish/Blue Crab

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Fish/Blue Crab Consumer	Adult	Lagoon	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg-sed	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab	calculated	mg/kg-tissue	calculated (6)	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BSAF-M	Biota-to-sediment accumulation factor for metals	chemical specific	kg-sed (dw)/kg-tissue (dw)	chemical specific	
				BSAF-O	Biota-to-sediment accumulation factor for organic chemicals	chemical specific	kg-OC (dw)/kg-lipid (dw)	chemical specific	
				OC	Percent Organic Carbon in Sediment	2.1	percent	site-specific	Metals:
				LI	Percent Lipid in Fish/Crab	5 / 3.8	percent	EPA, 2002	C-CF = C-SED x BSAF-M x MC
				MC	Moisture Content	0.75	kg-tissue (dw)/kg-tissue (ww)	EPA, 1993	
				IR-FC	Fish/Crab Ingestion Rate	0.227	kg-tissue/meal	EPA, 2000 (1)	Organic Chemicals:
				EF	Exposure Frequency	2	meals/week	(2)	C-CF = C-SED x BSAF-O x MC x (LI / OC)
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor	52	weeks/year	- -	
		Youth	Lagoon	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg-sed	See Table 3s.RME	CDI (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab	calculated	mg/kg-tissue	calculated (6)	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BSAF-M	Biota-to-sediment accumulation factor for metals	chemical specific	kg-sed (dw)/kg-tissue (dw)	chemical specific	
				BSAF-O	Biota-to-sediment accumulation factor for organic chemicals	chemical specific	kg-OC (dw)/kg-lipid (dw)	chemical specific	
				OC	Percent Organic Carbon in Sediment	2.1	percent	site-specific	Metals:
				LI	Percent Lipid in Fish/Crab	5 / 3.8	percent	EPA, 2002	C-CF = C-SED x BSAF-M x MC
				MC	Moisture Content	0.75	kg-tissue (dw)/kg-tissue (ww)	EPA, 1993	
				IR-FC	Fish/Crab Ingestion Rate	0.227	kg-tissue/meal	EPA, 2000 (1)	Organic Chemicals:
				EF	Exposure Frequency	2	meals/week	(2)	C-CF = C-SED x BSAF-O x MC x (LI / OC)
				ED	Exposure Duration	10	years	EPA, 1991	
				BW	Body Weight	39	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor	52	weeks/year	- -	
		Child	Lagoon	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg-sed	See Table 3s.RME	CDI (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab	calculated	mg/kg-tissue	calculated (6)	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BSAF-M	Biota-to-sediment accumulation factor for metals	chemical specific	kg-sed (dw)/kg-tissue (dw)	chemical specific	
				BSAF-O	Biota-to-sediment accumulation factor for organic chemicals	chemical specific	kg-OC (dw)/kg-lipid (dw)	chemical specific	
				OC	Percent Organic Carbon in Sediment	2.1	percent	site-specific	Metals:
				LI	Percent Lipid in Fish/Crab	5 / 3.8	percent	EPA, 2002	C-CF = C-SED x BSAF-M x MC
				MC	Moisture Content	0.75	kg-tissue (dw)/kg-tissue (ww)	EPA, 1993	
				IR-FC	Fish/Crab Ingestion Rate	0.114	kg-tissue/meal	(5)	Organic Chemicals:
				EF	Exposure Frequency	2	meals/week	(2)	C-CF = C-SED x BSAF-O x MC x (LI / OC)
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor	52	weeks/year	- -	

TABLE 4.6.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Fish/Blue Crab

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:
(1) EPA's default fish/shellfish meal size of 8 oz for the general adult population.
(2) Site-specific value based on the location of the site within a National Wildlife Refuge, the relatively small size and shallowness of the SWMU 6 lagoon, and the availability of other, more appealing fishing spots proximal to populated areas.
(3) Calculated as the product of ED (years) x 365 days/year.
(4) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.
(5) One half the adult fish/blue crab meal size of 8 oz.
(6) For those chemicals whose measured concentrations are available in biological tissue samples, measured concentrations rather than modeled concentrations are used as EPCs.

Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA. 1993. Wildlife exposure factors handbook. Volume I of II. EPA/600/R-93/187a
EPA, 2000: Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. Volume 2 Risk Assessment and Fish Consumption Limits Third Edition. Office of Water.

kg = Kilogram
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
ww = wet weight
dw = dry weight

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residential	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	24	years	EPA, 2002	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(1)	
		Child	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	6	years	EPA, 2002	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
		Child/Adult Aggregate	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S-Adj	Ingestion Rate of Soil, Age-adjusted	114.29	mg-year/kg-day	Calculated	CS x IR-S-Adj x EF x CF x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2002	IR-S-Adj (mg-year/kg-day) =
				CF	Conversion Factor	0.000001	kg/mg	- -	(ED-C x IR-S-C / BW-C) + (ED-A x IR-S-A / BW-A)
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
	Maintenance Worker	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(3)	
				ED	Exposure Duration	25	years	EPA, 2002	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
	Industrial Worker	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 2002	
				ED	Exposure Duration	25	years	EPA, 2002	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion (cont.)	Construction Worker	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Subchronic Daily Intake (SDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	330	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 2002	
				ED	Exposure Duration	1	years	EPA, 2002	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	365	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
Dermal	Residential	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2004 (4)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	24	years	EPA, 2002	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(1)	
		Child	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2004 (5)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	6	years	EPA, 2002	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
		Child/Adult Aggregate	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				DA-Adj	Dermal Absorption, Age-adjusted	361	mg-year/kg-day	Calculated	CS x DA-Adj x DABS x CF x EF x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2002	DA-Adj (mg-year/kg-day) =
				CF	Conversion Factor	0.000001	kg/mg	- -	(ED-C x SA-C x SSAF-C / BW-C) + (ED-A x SA-A x SSAF-A / BW-A)
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Maintenance Worker	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2004 (6)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem-specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(3)	
				ED	Exposure Duration	25	years	EPA, 2002	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
	Industrial Worker	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2004 (6)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem-specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	250	days/year	EPA, 2002	
				ED	Exposure Duration	25	years	EPA, 2002	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
	Construction Worker	Adult	North Area Surface Soil (0 - 6 inches)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	SDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2004 (6)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem-specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	250	days/year	EPA, 2002	
				ED	Exposure Duration	1	years	EPA, 2002	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	365	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.
(3) Based on best professional judgment.
(4) SA includes head, hands, forearms, and lower legs.
(5) SA includes head, hands, forearms, lower legs, and feet.
(6) SA includes head, hands, and forearms.

Sources:
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

cm^2 = Square centimeter
kg = Kilogram
kg/mg = Kilogram per milligram
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
mg/cm^2-day = Milligram per square centimeter per day
mg/day = Milligram per day

TABLE 4.7.RME Supplement A
VALUES USED FOR DAILY INTAKE CALCULATIONS (MUTAGENIC MODE OF ACTION)
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Route	Receptor Population	Exposure Point	Receptor Age		Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residential	North Area Surface Soil (0-6 inches)	Child/Adult Aggregate	Child (0-<2 yrs)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
					IR-S-Adj (0-2)	Age Adjusted Ingestion Rate of Soil (0-<2 yrs)	39.7	mg-yr/day-kg	calculated	CS x IR-S-Adj (0-2) x EF x CF1 x 1/AT
					EF	Exposure Frequency	350	days/year	EPA, 2002	[for child aged 0-<2 years]
					CF1	Conversion Factor 1	0.000001	kg/mg	- -	
					AT-C	Averaging Time (Cancer)	25,550	days	(1)	
				Child/Adolescent Aggregate (2-<16 yrs)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
					IR-S-Adj (2-16)	Age Adjusted Ingestion Rate of Soil (2-<16 yrs)	77.8	mg-yr/day-kg	calculated	CS x IR-S-Adj (2-16) x EF x CF1 x 1/AT
					EF	Exposure Frequency	350	days/year	EPA, 2002	[for child/adolescent aged 2-<16 years]
					CF1	Conversion Factor 1	0.000001	kg/mg	- -	
					AT-C	Averaging Time (Cancer)	25,550	days	(1)	
				Adolescent/Adult Aggregate (16-30 yrs)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
					IR-S-Adj (16-30)	Age Adjusted Ingestion Rate of Soil (16-<30 yrs)	20.7	mg-yr/day-kg	calculated	CS x IR-S-Adj (16-30) x EF x CF1 x 1/AT
					EF	Exposure Frequency	350	days/year	EPA, 2002	[for adolescent/adult aged 16-30 years]
					CF1	Conversion Factor 1	0.000001	kg/mg	- -	
					AT-C	Averaging Time (Cancer)	25,550	days	(1)	

TABLE 4.7.RME Supplement A
VALUES USED FOR DAILY INTAKE CALCULATIONS (MUTAGENIC MODE OF ACTION)
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil (0-6 inches)

Exposure Route	Receptor Population	Exposure Point	Receptor Age		Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Residential	North Area Surface Soil (0-6 inches)	Child/Adult Aggregate	Child (0-<2 yrs)	CS SSAF-Adj (0-2) DABS CF1 EF AT-C	Chemical Concentration in Soil Age Adjusted Soil to Skin Adherence Factor (0-<2 yrs) Dermal Absorption Factor Solids Conversion Factor 1 Exposure Frequency Averaging Time (Cancer)	See Table 3s.RME 103 chemical-Specific 0.000001 350 25,550	mg/kg mg-yr/day-kg -- kg/mg days/year days	See Table 3s.RME calculated EPA, 2004 - - EPA, 2002 (1)	CDI (mg/kg-day) = CS x SSAF-Adj (0-2) x DABS x CF1 x EF x 1/AT [for child aged 0-<2 years]
				Child/Adolescent Aggregate (2-<16 yrs)	CS SSAF-Adj (2-16) DABS CF1 EF AT-C	Chemical Concentration in Soil Age Adjusted Soil to Skin Adherence Factor(2-<16 yrs) Dermal Absorption Factor Solids Conversion Factor 1 Exposure Frequency Averaging Time (Cancer)	See Table 3s.RME 324 chemical-Specific 0.000001 350 25,550	mg/kg mg-yr/day-kg -- kg/mg days/year days	See Table 3s.RME calculated EPA, 2004 - - EPA, 2002 (1)	CDI (mg/kg-day) = CS x SSAF-Adj (2-16) x DABS x CF1 x EF x 1/AT [for child/adolescent aged 2-<16 years]
				Adolescent/Adult Aggregate (16-30 yrs)	CS SSAF-Adj (16-30) DABS CF1 EF AT-C	Chemical Concentration in Soil Age Adjusted Soil to Skin Adherence Factor(16-<30 yrs) Dermal Absorption Factor Solids Conversion Factor 1 Exposure Frequency Averaging Time (Cancer)	See Table 3s.RME 82.2 chemical-Specific 0.000001 350 25,550	mg/kg mg-yr/day-kg -- kg/mg days/year days	See Table 3s.RME calculated EPA, 2004 - - EPA, 2002 (1)	CDI (mg/kg-day) = CS x SSAF-Adj (16-30) x DABS x CF1 x EF x 1/AT [for adolescent/adult aged 16-30 years]

Notes:
(1) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

Sources:
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

cm^2 = Square centimeter
kg = Kilogram
kg/mg = Kilogram per milligram
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
mg/cm^2-day = Milligram per square centimeter per day
mg/day = Milligram per day

TABLE 4.8.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Ambient Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residential	Adult	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	
				ET	Exposure Time	24	hr/day	EPA, 2011	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	24	years	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(1)	
				CF	Conversion Factor	1/24	day/hr	- -	
		Child	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	
				ET	Exposure Time	24	hr/day	EPA, 2011	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	6	years	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF	Conversion Factor	1/24	day/hr	- -	
		Child/Adult Aggregate	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	Calculated	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	
				ET	Exposure Time	24	hr/day	EPA, 2011	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	30	years	EPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF	Conversion Factor	1/24	day/hr	- -	

TABLE 4.8.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Ambient Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation (cont.)	Maintenance Worker	Adult	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Supp C-1	
				ET	Exposure Time	8	hr/day	(3)	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	52	days/year	(3)	
				ED	Exposure Duration	25	years	EPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF	Conversion Factor	1/24	day/hr	- -	
	Industrial Worker	Adult	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	9.49E+08	m^3/kg	see Table 4 Suppl C-1	
				ET	Exposure Time	8	hr/day	EPA, 2011	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	250	days/year	EPA, 2002	
				ED	Exposure Duration	25	years	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF	Conversion Factor 1	1/24	day/hr	- -	
	Construction Worker	Adult	North Area Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	1.11E+07	m^3/kg	See Table 4 Suppl C-2	
				ET	Exposure Time	8	hr/day	EPA, 2011	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	250	days/year	EPA, 2002	
				ED	Exposure Duration	1	years	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	365	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF	Conversion Factor 1	1/24	day/hr	- -	

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.
(3) Based on best professional judgment.

Sources:
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2011: Regional Screening Levels for Chemical Contaminants at Superfund Sites. November.

mg/kg = Milligram per kilogram
mg/m^3 = Milligram per cubic meter
m^3/kg = Cubic meter per kilogram

TABLE 4.8.RME Supplement A
VALUES USED FOR DAILY INTAKE CALCULATIONS (MUTAGENIC MODE OF ACTION)
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Ambient Air

Exposure Route	Receptor Population	Exposure Point	Receptor Age		Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residential	North Area Emissions from Surface Soil	Child/Adult Aggregate	Child (0-<2 yrs)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Exposure Concentration (EC) (mg/m^3) =
					CA	Chemical Concentration in Air	calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
					PEF	Particulate Emission Factor	4.86E+08	m^3/kg	see Table 4 Supp C-1	[for child aged 0-<2 years]
					ET	Exposure Time	24	hr/day	EPA, 2011	
					EF	Exposure Frequency	350	days/year	EPA, 2002	CA (mg/m^3) = CS (1/PEF)
					ED	Exposure Duration	2	years	--	
					AT-C	Averaging Time (Cancer)	25,550	days	(1)	
					CF	Conversion Factor 1	1/24	day/hr	- -	
				Child/Adolescent Aggregate (2-<16 yrs)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
					CA	Chemical Concentration in Air	calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
					PEF	Particulate Emission Factor	4.86E+08	m^3/kg	see Table 4 Supp C-1	[for child/adolescent aged 2-<16 years]
					ET	Exposure Time	24	hr/day	EPA, 2011	
					EF	Exposure Frequency	350	days/year	EPA, 2002	CA (mg/m^3) = CS (1/PEF)
					ED	Exposure Duration	14	years	--	
					AT-C	Averaging Time (Cancer)	25,550	days	(1)	
					CF	Conversion Factor 1	1/24	day/hr	- -	
				Adolescent/Adult Aggregate (16-30 yrs)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
					CA	Chemical Concentration in Air	calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
					PEF	Particulate Emission Factor	4.86E+08	m^3/kg	see Table 4 Supp C-1	[for adolescent/adult aged 16-30 years]
					ET	Exposure Time	24	hr/day	EPA, 2011	
					EF	Exposure Frequency	350	days/year	EPA, 2002	CA (mg/m^3) = CS (1/PEF)
					ED	Exposure Duration	14	years	--	
					AT-C	Averaging Time (Cancer)	25,550	days	(1)	
					CF	Conversion Factor 1	1/24	day/hr	- -	

Notes:
(1) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

Sources:
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2011: Regional Screening Levels for Chemical Contaminants at Superfund Sites. November.

kg = Kilogram
mg/kg = Milligram per kilogram
mg/m^3 = Milligram per cubic meter
m^3/kg = Cubic meter per kilogram

TABLE 4 Supplement B
AGE-ADJUSTED EXPOSURE FACTORS
SWMU 6
Former NASD, Vieques, Puerto Rico

			Intake Rate			Dermal				Age-Adjusted Exposure Factors						
AGE (year)	ED (years)	BW [1] (kg)	SOIL IR-SO [2] (mg/day)	SEDIMENT IR-Sed (mg/day)	SURFACE WATER IR-SW (L/hour)	SOIL SAF [3] (mg/cm^2-event)	SED SAF (mg/cm^2-event)	EXPOSED SA [4] (cm^2)	TOTAL SA [5] (cm^2)	AGE GROUP	IR-SO-Adj (mg-yr/day-kg)	IR-SED-Adj (mg-yr/day-kg)	IR-SW-Adj (liter-yr/hour-kg)	SOIL SAF-Adj (mg-yr/day-kg)	SED SAF-Adj (mg-yr/day-kg)	TOTAL SA (cm^2-yr/kg)
0	1	9.1	200	50	0.01	0.2	0.36	2,625	5,910	0-<2 yrs	39.7	9.9	0.0020	103	186	1,172
1	1	11.3	200	50	0.01	0.2	0.36	2,571	5,910							
2	1	13.3	200	50	0.01	0.2	0.36	2,434	5,910	2-<6 yrs	49.8	12.4	0.0025	144	259	1,685
3	**1**	**15.3**	**200**	**50**	**0.01**	**0.2**	**0.36**	**2,893**	**6,565**							
4	**1**	**17.4**	**200**	**50**	**0.01**	**0.2**	**0.36**	**3,175**	**7,185**							
5	**1**	**19.7**	**200**	**50**	**0.01**	**0.2**	**0.36**	**3,255**	**7,860**							
6	**1**	**22.6**	**100**			**0.2**		**2,949**	**8,545**	**6-<16 yrs**	**28.1**			**180**		**3,234**
7	1	24.9	100			0.2		3,182	9,265							
8	1	28.1	100			0.2		3,434	10,000							
9	1	31.5	100			0.2		3,657	10,650							
10	1	36.3	100			0.2		3,819	11,750							
11	1	41.1	100			0.2		4,111	12,650							
12	1	45.3	100			0.2		4,453	13,700							
13	1	50.4	100			0.07		4,916	14,750							
14	1	56	100			0.07		5,205	15,800							
15	1	58.1	100			0.07		5,386	16,350							
										2-<16 yrs	77.8			323.8		4,920
16	1	62.6	100			0.07		5,534	16,800	16-<30 yrs	20.7			82.2		3,687
17	1	63.2	100			0.07		5,641	17,150							
18	1	65.1	100			0.07		5,700	18,000							
19	1	66	100			0.07		5,700	18,000							
20	1	67.2	100			0.07		5,700	18,000							
21	1	67.2	100			0.07		5,700	18,000							
22	1	67.2	100			0.07		5,700	18,000							
23	1	67.2	100			0.07		5,700	18,000							
24	1	67.2	100			0.07		5,700	18,000							
25	1	71.5	100			0.07		5,700	18,000							
26	1	71.5	100			0.07		5,700	18,000							
27	1	71.5	100			0.07		5,700	18,000							
28	1	71.5	100			0.07		5,700	18,000							
29	1	71.5	100			0.07		5,700	18,000							

Equations and Definitions:

IR-SO-Adj/IR-SED-Adj (mg-yr/day-kg) $\sum$ (ED * IR) / BW
IR-SW-Adj (liter-yr/day-kg)
SAF-Adj (mg-yr/day-kg)
TOTAL-SA (cm^2-yr/kg) $\sum$ (ED * SAF * SA $_{Exposed}$) / BW
$\sum$ (ED * SA $_{Total}$) / BW

ED - Exposure duration
BW - Body weight
IR - Ingestion rate
SAF - Skin adherence factor
SA - Skin surface area

SO - Soil
SED - Sediment
SW - Surface Water

References:

[1] EPA 1997. Exposure Factors Handbook. Tables 7-2 (adults) and 7-3 (children), mean. Values are mean of male and female. Source: National Center of Health Statistics (NCHS) 1987.

[2] EPA 1991. Standard Default Exposure Factors. Default for resident child and adult.

[3] EPA 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment).
Recommended default adherence factor for a child resident (0.2) and adult resident (0.07). For older children, the geometric mean weighted adherence factor for children playing in wet soil was used for children 6 - 12, as an estimate of a high-end soil contact activity (see Exhibit 3-3).

[4] EPA 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)
Calculated from Exhibit C-1 - Body Part-Specific Surface Area Calculations (Children). Data from Exposure Factors Handbook, Tables 6-6, 6-7 and 6-8.
Surface area of head, forearms, hands, lower legs and feet (for child <6 years); feet excluded from surface area calculation for >6 years.
Surface area for >18 is recommended default for adult resident (EPA 2004).

[5] EPA 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)
Exhibit C-1 - Body Part-Specific Surface Area Calculations (Children). Data from Exposure Factors Handbook, Tables 6-6 and 6-7.

Total Body Surface Area (50th percentile).

Adolescent Trespasser Exposure Factors (Age 6-16)

TABLE 4 Supplement C-1
Particulate Emission Factor - Recreational User/Trespasser/Site Visitor, Resident, Industrial Worker, and Maintenance Worker
SWMU 6
Former NASD, Vieques, Puerto Rico

PEF Equations:

$$Q/C_{wind} = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$ **Exhibit D-2 (EPA, 2002)**

$$PEF = Q/C_{wind} \times \frac{3{,}600 \text{sec/hr}}{0.036 \times (1-V) \times \left(U_m/U_t\right)^3 \times F(x)}$$ **ion 4-5 (EPA, 2002)**

PEF and Box Model Input Parameters

Parameter	Definition	Value	Units	Source
Q/C_{wind}	inverse ratio of the geometric mean air concentration to the emission flux at the center of a square source	**89**	m	calculated
A	Constant for Zone 9 (Miami, FL)	12.196	unitless	Exhibit D-2 (EPA, 2002)
B	Constant for Zone 9 (Miami, FL)	19.065	unitless	Exhibit D-2 (EPA, 2002)
C	Constant for Zone 9 (Miami, FL)	215.392	unitless	Exhibit D-2 (EPA, 2002)
A_{site}	Areal extent of site contamination	0.2	acres	site-specific
PEF	particulate emission factor	**9.49E+08**	m^3/kg	calculated
V	fraction of vegetative cover	0.5	unitless	Default (Eqn. 4-5)
Um	mean annual windspeed	5.19	m/s	Note 1 (Dept. of Navy, 1979)
Ut	equivalent threshold value of windspeed at 7 m	11.32	m/s	Default (Eqn. 4-5)
F(x)	function dependent on Um/Ut derived using Cowherd et al. (1985)	0.194	unitless	Default (Eqn. 4-5)

Source:

Note 1 - The daily average windspeed from measurements at Observation Post 5 on Vieques (10.1 knots = 5.19 m/s) was used.
Sources:

Department of the Navy. 1979. Draft Environmental Impact Statement: Volume I – Continued Use of the Atlantic Fleet Weapons Training Facility Inner Range (Vieques). December.

EPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, EPA Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.

TABLE 4 Supplement C-2
Particulate Emission Factor - Construction Worker
SWMU 6
Former NASD, Vieques, Puerto Rico

PEF Equations:

$$Q/C_{Sr} = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$

Equation 5-6 (EPA, 2002)

$$PEF_{SC} = Q/C_{Sr} \times \frac{1}{F_D} \frac{T \times A_R}{556 \times (W/3)^{0.4} \times \left(\frac{365\ d/yr - p}{365\ d/yr}\right) \times \sum VKT}$$

Equation 5-5 (EPA, 2002)

$$F_D = 0.1852 + \frac{5.3537}{t_c} + \frac{-9.6318}{t_c^2}$$

Equation E-16 (EPA, 2002)

PEF and Box Model Input Parameters

Parameter	Definition	Value	Units	Source
Q/C_{Sr}	inverse ratio of the geometric mean air concentration to the emission flux at the center of a square source	**27.4**	m	calculated
A	Constant	12.9351	unitless	default (Eqn. 5-6)
B	Constant	5.7383	unitless	default (Eqn. 5-6)
C	Constant	71.7711	unitless	default (Eqn. 5-6)
A_{site}	Areal extent of site contamination	0.2	acres	site-specific
PEF_{SC}	subchronic road particulate emission factor	**1.11E+07**	m^3/kg	calculated
F_D	Dispersion correction factor	0.188	unitless	calculated
t_c	duration of construction (250 days for 8 hr/day)	2,000	hr	assumed
T	total time over which construction occurs (t_c x 3600 s/hr)	7,200,000	s	assumed
A_R	surface area of contaminated road segment (square root of site surface contamination configured as a square x default width of road segment of 20 ft)	173	m^2	calculated
W	mean weight of vehicle [(1 car @ 2 tons/car) + (2 trucks @ 20 tons/truck)] / 3 vehicles)	14	tons	assumed
p	number of days with at least 0.01 inches of precipitation (based on measured 2005 data)	92	days/yr	site-specific
VKT	sum of fleet vehicle kilometers traveled during the exposure duration (assumed 3 vehicles x 0.3 km/day x 250 days)	21.3	km	assumed

Source:

EPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, EPA Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.

TABLE 4 Supplement D
DERMAL ABSORPTION FRACTION FROM SOIL
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical Group	CAS Number	Chemical	Dermal Absorption Fraction	Note
Metals	**7429-90-5**	**Aluminum**	**NA**	**(1)**
Metals	**7440-36-0**	**Antimony**	**NA**	**(1)**
Metals	**7440-38-2**	**Arsenic**	**0.03**	**EPA, 2004**
Metals	7440-47-3	Chromium (hexavalent)	NA	(1)
Metals	7440-48-4	Cobalt	NA	(1)
Metals	7439-89-6	Iron	NA	(1)
Metals	7439-92-1	Lead	NA	(1)
Metals	7439-96-5	Manganese	NA	(1)
Metals	7440-28-0	Thallium	NA	(1)
Metals	7440-62-2	Vanadium	NA	(1)
PCB	11097-69-1	Aroclor-1254	0.14	EPA, 2004
PAH	50-32-8	Benzo(a)pyrene	0.13	EPA, 2004
PAH	205-99-2	Benzo(b)fluoranthene	0.13	EPA, 2004

Notes:
Dermal Absorption Fractions were obtained from EPA RAGS Part E Exhibit 3-4 (EPA, 2004) and RSL Table (EPA, 2011).

(1) Default dermal absorption values are not currently available for inorganics due to the lack of absorption data.
Therefore, consistent with EPA RAGS Part E (EPA, 2004a) and the RSL Table (EPA, 2011), dermal exposure is not assessed for these constituents.

Sources:
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual.
Part E, Supplemental Guidance for Dermal Risk Assessment (Final). EPA/540/R/99/005. July 2004.
EPA, 2011: Regional Screening Levels for Chemical Contaminants at Superfund Sites. November.

PAH - Polycyclic Aromatic Hydrocarbon
PCB - Polychlorinated Biphenyl
NA - Not Available/Not Applicable

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units	(1)	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	Chronic	1.0E+00	mg/kg-day	100%	1.0E+00	mg/kg-day	Neurotoxicity	100	PPRTV (3)	5/2012
Aluminum	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	Chronic	4.0E-04	mg/kg-day	15%	6.0E-05	mg/kg-day	Longevity, Blood	1000 / 1	IRIS	1/19/2012
Antimony	Subchronic	4.0E-04	mg/kg-day	15%	6.0E-05	mg/kg-day	Mortality, Blood	1000	HEAST	7/31/1997
Arsenic	Chronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Skin, Vascular	3 / 1	IRIS	1/19/2012
Arsenic	Subchronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Skin	3	HEAST	7/31/1997
Cadmium (diet)	Chronic	1.0E-03	mg/kg-day	2.5%	2.5E-05	mg/kg-day	Kidney	10/1	IRIS	1/19/2012
Cadmium (diet)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (water)	Chronic	5.0E-04	mg/kg-day	5%	2.5E-05	mg/kg-day	Kidney	10/1	IRIS	1/19/2012
Cadmium (water)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (trivalent)	Chronic	1.5E+00	mg/kg-day	1.3%	2.0E-02	mg/kg-day	NOE	100 / 10	IRIS	1/19/2012
Chromium (trivalent)	Subchronic	1.0E+00	mg/kg-day	1.3%	1.3E-02	mg/kg-day	NOE	1000	HEAST	7/31/1997
Cobalt	Chronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Thyroid	3000	PPRTV (3)	5/2012
Cobalt	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	Chronic	4.0E-02	mg/kg-day	100%	4.0E-02	mg/kg-day	GI System	NA	HEAST (3)	5/2012
Copper	Subchronic	4.0E-02	mg/kg-day	100%	4.0E-02	mg/kg-day	GI System	NA	HEAST (3)	5/2012
Iron	Chronic	7.0E-01	mg/kg-day	100%	7.0E-01	mg/kg-day	GI System	1.5	PPRTV (3)	5/2012
Iron	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	Chronic / Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (diet)	Chronic	1.4E-01	mg/kg-day	4%	5.6E-03	mg/kg-day	CNS	1/1	IRIS	1/19/2012
Manganese (diet)	Subchronic	1.4E-01	mg/kg-day	4%	5.6E-03	mg/kg-day	CNS	1	HEAST	7/31/1997
Manganese (non-diet)	Chronic	2.4E-02	mg/kg-day	4%	9.6E-04	mg/kg-day	CNS	1/3	IRIS (3, 4)	5/2012
Manganese (non-diet)	Subchronic	2.4E-02	mg/kg-day	4%	9.6E-04	mg/kg-day	CNS	1/3	HEAST (4)	7/31/1997
Methyl Mercury	Chronic	1.0E-04	mg/kg-day	95%	1.0E-04	mg/kg-day	Developmental	10 / 1	IRIS	1/19/2012
Methyl Mercury	Subchronic	1.0E-04	mg/kg-day	95%	1.0E-04	mg/kg-day	Developmental neurological	10	HEAST	7/31/1997
Nickel	Chronic	2.0E-02	mg/kg-day	4%	8.0E-04	mg/kg-day	Body Weight, Organ Weight	300 / 1	IRIS	1/19/2012
Nickel	Subchronic	2.0E-02	mg/kg-day	4%	8.0E-04	mg/kg-day	Body Weight, Organ Weight	300	HEAST	7/31/1997
Silver	Chronic	5.0E-03	mg/kg-day	4%	2.0E-04	mg/kg-day	Skin	3 / 1	IRIS	1/19/2012
Silver	Subchronic	5.0E-03	mg/kg-day	4%	2.0E-04	mg/kg-day	Skin	3	HEAST	7/31/1997
Thallium	Chronic	1.0E-05	mg/kg-day	100%	1.0E-05	mg/kg-day	Hair	3000	PPRTV (3)	5/2012
Thallium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	Chronic	5.0E-03	mg/kg-day	2.6%	1.3E-04	mg/kg-day	Hair	100 / 1	IRIS	1/19/2012
Vanadium	Subchronic	7.0E-03	mg/kg-day	2.6%	1.8E-04	mg/kg-day	Whole body	100	HEAST	7/31/1997
Zinc	Chronic	3.0E-01	mg/kg-day	100%	3.0E-01	mg/kg-day	Blood	3 / 1	IRIS	1/19/2012
Zinc	Subchronic	3.0E-01	mg/kg-day	100%	3.0E-01	mg/kg-day	Blood	3	HEAST	7/31/1997
4,4'-DDD	Chronic / Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	Chronic / Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	Chronic	5.0E-04	mg/kg-day	70-90%	5.0E-04	mg/kg-day	Liver	100 / 1	IRIS	1/19/2012
4,4'-DDT	Subchronic	5.0E-04	mg/kg-day	70-90%	5.0E-04	mg/kg-day	Liver	100	HEAST	7/31/1997
Aroclor-1254	Chronic	2.0E-05	mg/kg-day	80-96%	2.0E-05	mg/kg-day	Finger nails, Eyes	300 / 1	IRIS	1/19/2012
Aroclor-1254	Subchronic	5.0E-05	mg/kg-day	80-96%	5.0E-05	mg/kg-day	Immune system	100	HEAST	7/31/1997
PCBs (Dioxin-Like) (5)	Chronic	7.0E-10	mg/kg-day	>50%	7.0E-10	mg/kg-day	Reproduction	30	IRIS	5/17/2012
PCBs (Dioxin-Like) (5)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (Non-Dioxin-Like) (6)	Chronic	2.0E-05	mg/kg-day	80-96%	2.0E-05	mg/kg-day	Finger nails, Eyes	300 / 1	IRIS	1/19/2012

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units	(1)	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
PCBs (Non-Dioxin-Like) (6)	Subchronic	5.0E-05	mg/kg-day	80-96%	5.0E-05	mg/kg-day	Immune system	100	HEAST	7/31/1997
Benzo(a)pyrene	Chronic / Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic / Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Chronic	6.0E-03	mg/kg-day	>50%	6.0E-03	mg/kg-day	Neurological	1000 / 1	IRIS	2/10/2012
Tetrachloroethene	Subchronic	1.0E-01	mg/kg-day	>50%	1.0E-01	mg/kg-day	Liver	100	HEAST	7/31/1997
Chromium (hexavalent)	Chronic	3.0E-03	mg/kg-day	2.5%	7.5E-05	mg/kg-day	NOE	300 / 3	IRIS	1/19/2012
Chromium (hexavalent)	Subchronic	2.0E-02	mg/kg-day	2.5%	5.0E-04	mg/kg-day	NOE	100	HEAST	7/31/1997

Note:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) As cited in Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (USEPA, May 2012).

(4) The RfD (0.14 mg/kg-day) presented in IRIS and HEAST includes manganese from all sources, including diet. This RfD was adjusted by subtracting the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) and applying a modifying factor of 3 to address uncertainties associated with non-food manganese exposure sources.

(5) Toxicity information for 2,3,7,8-Tetrachlorodibenzo-p-dioxin used for dioxin-like PCBs.

(6) Toxicity information for Aroclor-1254 used as a surrogate for non-dioxin-like PCBs.

Definitions:

CNS = Central Nervous System
GI System = Gastrointestinal System
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NA = Not Available
NOE = No Observed Effects
PPRTV = Provisional Peer-Reviewed Toxicity Value

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	Chronic	5.0E-03	mg/m^3	Nervous System	300	PPRTV (2)	5/2012
Aluminum	Subchronic	NA	NA	NA	NA	NA	NA
Antimony (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	1.5E-05	mg/m^3	Cardiovascular, Nervous System, Development	NA	Cal/EPA (2)	5/2012
Arsenic	Subchronic	NA	NA	NA	NA	NA	NA
Cadmium (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Chromium (trivalent) (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Cobalt	Chronic	6.0E-06	mg/m^3	Respiratory	300	PPRTV (2)	5/2012
Cobalt	Subchronic	NA	NA	NA	NA	NA	NA
Copper (1)	Chronic/Subchronic	NA	NA	NA	NA	NA	NA
Iron	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Lead (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m^3	Nervous System	1000 / 1	IRIS	1/19/2012
Manganese	Subchronic	NA	NA	NA	NA	NA	NA
Methyl Mercury (1)	Chronic/Subchronic	NA	NA	NA	NA	NA	NA
Nickel (1)	Chronic/Subchronic	NA	NA	NA	NA	NA	NA
Silver (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Thallium (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Vanadium	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Zinc (1)	Chronic/Subchronic	NA	NA	NA	NA	NA	NA
4,4'-DDD (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
4,4'-DDE (1)	Chronic/Subchronic	NA	NA	NA	NA	NA	NA
4,4'-DDT (1)	Chronic/Subchronic	NA	NA	NA	NA	NA	NA
Aroclor-1254	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
PCBs (Dioxin-Like) (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
PCBs (Non-Dioxin-Like) (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Tetrachloroethene (1)	Chronic / Subchronic	NA	NA	NA	NA	NA	NA
Chromium (hexavalent)	Chronic	1.0E-04	mg/m^3	Respiratory	300 / 1	IRIS	1/19/2012
Chromium (hexavalent)	Subchronic	NA	NA	NA	NA	NA	NA

Note:

(1) This chemical was not identified as a COPC in surface soil (0-6 inches). Therefore, inhalation exposures and risks will not be quantified for this chemical and inhalation toxicity criteria, if applicable, are not presented on this table.

(2) As cited in Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (USEPA, May 2012).

Definitions:

Cal/EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
NA = Not Available
PPRTV = Provisional Peer-Reviewed Toxicity Value

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	$(mg/kg\text{-}day)^{-1}$	95%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	1/19/2012
Cadmium	NA	NA	NA	NA	NA	B1	NA	NA
Chromium (trivalent)	NA	NA	NA	NA	NA	D	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	D	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	D	NA	NA
Methyl Mercury	NA	NA	NA	NA	NA	C	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	D	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	D	NA	NA
4,4'-DDD	2.4E-01	$(mg/kg\text{-}day)^{-1}$	>50%	2.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/19/2012
4,4'-DDE	3.4E-01	$(mg/kg\text{-}day)^{-1}$	>50%	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/19/2012
4,4'-DDT	3.4E-01	$(mg/kg\text{-}day)^{-1}$	70-90%	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/19/2012
Aroclor-1254	2.0E+00	$(mg/kg\text{-}day)^{-1}$	80-96%	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/19/2012
PCBs (Dioxin-Like) (5)	1.3E+05	$(mg/kg\text{-}day)^{-1}$	>50%	1.3E+05	$(mg/kg\text{-}day)^{-1}$	B2	Cal/EPA (4)	5/2012
PCBs (Non-Dioxin-Like) (6)	2.0E+00	$(mg/kg\text{-}day)^{-1}$	80-96%	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/19/2012
Benzo(a)pyrene (3)	7.3E+00	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/19/2012
Benzo(b)fluoranthene (3)	7.3E-01	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	ECAO (4)	5/2012
Tetrachloroethene	2.1E-03	$(mg/kg\text{-}day)^{-1}$	>50%	2.1E-03	$(mg/kg\text{-}day)^{-1}$	NA	IRIS	5/10/2012
Chromium (hexavalent) (3)	5.0E-01	$(mg/kg\text{-}day)^{-1}$	2.5%	2.0E+01	$(mg/kg\text{-}day)^{-1}$	D	NJ (4)	5/2012

Note:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral slope factor should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

Definitions:

Cal/EPA = California Environemental Protection Agency
ECAO = Environmental Criteria and Assessment Office
IRIS = Integrated Risk Information System
NA = Not Available
NJ = New Jersey

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)

(3) This chemical operates with a mutagenic mode of action (USEPA, 2005).
Chemical-specific data are not available; therefore, USEPA (2005) default age-dependant adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<30	1

(4) As cited in Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (USEPA, May 2012).

(5) Toxicity information for 2,3,7,8-Tetrachlorodibenzo-p-dioxin used for dioxin-like PCBs.

(6) Toxicity information for PCBs (high risk) used as a surrogate for non-dioxin-like PCBs.

Weight of Evidence definitions:
Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.
Group B1 chemicals (probable human carcinogens) are agents for which there is limited evidence of possible carcinogenicity in humans.
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.
Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.
Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.
Group E chemicals (evidence of noncarcinogenicity in humans) are agents for which there is no evidence of carcinogenicity from human or animal studies, or both.

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	NA	NA	NA	NA	NA
Antimony (1)	NA	NA	NA	NA	NA
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	A	IRIS	1/19/2012
Cadmium (1)	NA	NA	NA	NA	NA
Chromium (trivalent) (1)	NA	NA	NA	NA	NA
Cobalt	9.0E-03	$(ug/m^3)^{-1}$	NA	PPRTV (3)	5/2012
Copper (1)	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA
Lead (1)	NA	NA	NA	NA	NA
Manganese	NA	NA	D	NA	NA
Methyl Mercury (1)	NA	NA	NA	NA	NA
Nickel (1)	NA	NA	NA	NA	NA
Silver (1)	NA	NA	NA	NA	NA
Thallium (1)	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA
Zinc (1)	NA	NA	NA	NA	NA
4,4'-DDD (1)	NA	NA	NA	NA	NA
4,4'-DDE (1)	NA	NA	NA	NA	NA
4,4'-DDT (1)	NA	NA	NA	NA	NA
Aroclor-1254	5.7E-04	$(ug/m^3)^{-1}$	B2	IRIS (3)	5/2012
PCBs (Dioxin-Like) (1)	NA	NA	NA	NA	NA
PCBs (Non-Dioxin-Like) (1)	NA	NA	NA	NA	NA
Benzo(a)pyrene (2)	1.1E-03	$(ug/m^3)^{-1}$	B2	Cal/EPA (3)	5/2012
Benzo(b)fluoranthene (2)	1.1E-04	$(ug/m^3)^{-1}$	B2	Cal/EPA (3)	5/2012
Tetrachloroethene (1)	NA	NA	NA	NA	NA
Chromium (hexavalent) (2)	8.4E-02	$(ug/m^3)^{-1}$	A	IRIS (3)	1/19/2012

Note:

(1) This chemical was not identified as a COPC in surface soil (0-6 inches). Therefore, inhalation exposures and risks will not be quantified for this chemical and inhalation toxicity criteria, if applicable, are not presented on this table.

(2) This chemical operates with a mutagenic mode of action (USEPA, 2005). Chemical-specific data are not available; therefore, USEPA (2005) default age-dependant adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<30	1

(3) As cited in Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (USEPA, May 2012).

Definitions:

NA = Not Available
IRIS = Integrated Risk Information System
CalEPA = California EPA
PPRTV = Provisional Peer-Reviewed Toxicity Value

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)

Weight of Evidence definitions:
Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.
Group B1 chemicals (probable human carcinogens) are agents for which there is limited evidence of possible carcinogenicity in humans.
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.
Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.
Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.
Group E chemicals (evidence of noncarcinogenicity in humans) are agents for which there is no evidence of carcinogenicity from human or animal studies, or both.

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Aluminum	1.6E+04	mg/kg	2.3E-03	mg/kg/day	NA	NA	NA	6.6E-03	mg/kg/day	1.0E+00	mg/kg/day	0.007
				Arsenic	1.8E+00	mg/kg	2.5E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	3.8E-07	7.3E-07	mg/kg/day	3.0E-04	mg/kg/day	0.002
				Cobalt	1.7E+01	mg/kg	2.3E-06	mg/kg/day	NA	NA	NA	6.7E-06	mg/kg/day	3.0E-04	mg/kg/day	0.02
				Iron	3.2E+04	mg/kg	4.5E-03	mg/kg/day	NA	NA	NA	1.3E-02	mg/kg/day	7.0E-01	mg/kg/day	0.02
				Manganese	9.6E+02	mg/kg	1.3E-04	mg/kg/day	NA	NA	NA	3.9E-04	mg/kg/day	2.4E-02	mg/kg/day	0.02
				Vanadium	1.1E+02	mg/kg	1.5E-05	mg/kg/day	NA	NA	NA	4.4E-05	mg/kg/day	5.0E-03	mg/kg/day	0.009
				Aroclor-1254	1.2E-01	mg/kg	1.7E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	3.3E-08	4.9E-08	mg/kg/day	2.0E-05	mg/kg/day	0.002
				Benzo(a)pyrene	1.2E-01	mg/kg	1.7E-08	mg/kg/day	7.3E+00	1/(mg/kg/day)	1.2E-07	5.0E-08	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	3.0E-08	mg/kg/day	7.3E-01	1/(mg/kg/day)	2.2E-08	8.7E-08	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	3.3E-07	mg/kg/day	5.0E-01	1/(mg/kg/day)	1.7E-07	9.7E-07	mg/kg/day	3.0E-03	mg/kg/day	3.2E-04
			Exp. Route Total								7.2E-07					0.08
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Dermal	Aluminum	1.6E+04	mg/kg	--	--	NA	NA	NA	--	--	1.0E+00	mg/kg/day	NA
				Arsenic	1.8E+00	mg/kg	8.6E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.3E-07	2.5E-07	mg/kg/day	3.0E-04	mg/kg/day	8.4E-04
				Cobalt	1.7E+01	mg/kg	--	--	NA	NA	NA	--	--	3.0E-04	mg/kg/day	NA
				Iron	3.2E+04	mg/kg	--	--	NA	NA	NA	--	--	7.0E-01	mg/kg/day	NA
				Manganese	9.6E+02	mg/kg	--	--	NA	NA	NA	--	--	9.6E-04	mg/kg/day	NA
				Vanadium	1.1E+02	mg/kg	--	--	NA	NA	NA	--	--	1.3E-04	mg/kg/day	NA
				Aroclor-1254	1.2E-01	mg/kg	2.7E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	5.3E-08	7.8E-08	mg/kg/day	2.0E-05	mg/kg/day	0.004
				Benzo(a)pyrene	1.2E-01	mg/kg	2.5E-08	mg/kg/day	7.3E+00	1/(mg/kg/day)	1.8E-07	7.4E-08	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	4.4E-08	mg/kg/day	7.3E-01	1/(mg/kg/day)	3.2E-08	1.3E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	--	--	2.0E+01	1/(mg/kg/day)	NA	--	--	7.5E-05	mg/kg/day	NA
			Exp. Route Total								4.0E-07					0.005
		Exposure Point Total									1.1E-06					0.08
	Exposure Medium Total										1.1E-06					0.08

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Aluminum	1.7E-05	mg/m^3	2.8E-07	mg/m^3	NA	NA	NA	8.1E-07	mg/m^3	5.0E-03	mg/m3	1.6E-04
				Arsenic	1.9E-09	mg/m^3	3.1E-11	mg/m^3	4.3E-03	1/(ug/m3)	1.3E-10	9.0E-11	mg/m^3	1.5E-05	mg/m3	6.0E-06
				Cobalt	1.7E-08	mg/m^3	2.8E-10	mg/m^3	9.0E-03	1/(ug/m3)	2.5E-09	8.3E-10	mg/m^3	6.0E-06	mg/m3	1.4E-04
				Iron	3.4E-05	mg/m^3	5.5E-07	mg/m^3	NA	NA	NA	1.6E-06	mg/m^3	NA	NA	NA
				Manganese	1.0E-06	mg/m^3	1.6E-08	mg/m^3	NA	NA	NA	4.8E-08	mg/m^3	5.0E-05	mg/m3	9.6E-04
				Vanadium	1.1E-07	mg/m^3	1.9E-09	mg/m^3	NA	NA	NA	5.4E-09	mg/m^3	NA	NA	NA
				Aroclor-1254	1.3E-10	mg/m^3	2.1E-12	mg/m^3	5.7E-04	1/(ug/m3)	1.2E-12	6.0E-12	mg/m^3	NA	NA	NA
				Benzo(a)pyrene	1.3E-10	mg/m^3	2.1E-12	mg/m^3	1.1E-03	1/(ug/m3)	2.3E-12	6.1E-12	mg/m^3	NA	NA	NA
				Benzo(b)fluoranthene	2.2E-10	mg/m^3	3.7E-12	mg/m^3	1.1E-04	1/(ug/m3)	4.0E-13	1.1E-11	mg/m^3	NA	NA	NA
				Chromium (hexavalent)	2.5E-09	mg/m^3	4.1E-11	mg/m^3	8.4E-02	1/(ug/m3)	3.4E-09	1.2E-10	mg/m^3	1.0E-04	mg/m3	1.2E-06
			Exp. Route Total								6.1E-09					0.001
		Exposure Point Total									6.1E-09					0.001
	Exposure Medium Total										6.1E-09					0.001
Soil Total											1.1E-06					0.08
Surface Water	Surface Water	Surface Water	Ingestion	Antimony	1.0E+01	ug/L	5.7E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-06	mg/kg/day	4.0E-04	mg/kg/day	0.004
				Cadmium	1.6E+01	ug/L	8.9E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	2.6E-06	mg/kg/day	5.0E-04	mg/kg/day	0.005
				Thallium	1.2E+02	ug/L	6.8E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	2.0E-05	mg/kg/day	1.0E-05	mg/kg/day	2
				Chromium (hexavalent)	4.1E+01	ug/L	2.3E-06	mg/kg/day	5.0E-01	1/(mg/kg-day)	1.1E-06	6.7E-06	mg/kg/day	3.0E-03	mg/kg/day	0.002
			Exp. Route Total								1.1E-06					2
Surface Water	Surface Water	Surface Water	Dermal	Antimony	1.0E+01	ug/L	1.0E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	3.0E-06	mg/kg/day	4.0E-04	mg/kg/day	0.008
				Cadmium	1.6E+01	ug/L	1.6E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	4.7E-06	mg/kg/day	2.5E-05	mg/kg/day	0.2
				Thallium	1.2E+02	ug/L	1.2E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	3.5E-05	mg/kg/day	1.0E-05	mg/kg/day	4
				Chromium (hexavalent)	4.1E+01	ug/L	8.2E-06	mg/kg/day	2.0E+01	1/(mg/kg-day)	1.6E-04	2.4E-05	mg/kg/day	7.5E-05	mg/kg/day	0.3
			Exp. Route Total								1.6E-04					4
		Exposure Point Total									1.7E-04					6
	Exposure Medium Total										1.7E-04					6
Surface Water Total											1.7E-04					6

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Ingestion	Aluminum	1.4E+04	mg/kg	1.0E-03	mg/kg/day	NA	NA	NA	2.9E-03	mg/kg/day	1.0E+00	mg/kg/day	0.003
				Antimony	3.9E+00	mg/kg	2.7E-07	mg/kg/day	NA	NA	NA	7.9E-07	mg/kg/day	4.0E-04	mg/kg/day	0.002
				Arsenic	7.8E+00	mg/kg	5.4E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	8.2E-07	1.6E-06	mg/kg/day	3.0E-04	mg/kg/day	0.005
				Cobalt	9.0E+00	mg/kg	6.3E-07	mg/kg/day	NA	NA	NA	1.8E-06	mg/kg/day	3.0E-04	mg/kg/day	0.006
				Iron	4.6E+04	mg/kg	3.2E-03	mg/kg/day	NA	NA	NA	9.3E-03	mg/kg/day	7.0E-01	mg/kg/day	0.01
				Lead	2.3E+02	mg/kg	1.6E-05	mg/kg/day	NA	NA	NA	4.8E-05	mg/kg/day	NA	NA	NA
				Manganese	3.6E+02	mg/kg	2.5E-05	mg/kg/day	NA	NA	NA	7.2E-05	mg/kg/day	2.4E-02	mg/kg/day	0.003
				Thallium	5.2E+00	mg/kg	3.6E-07	mg/kg/day	NA	NA	NA	1.1E-06	mg/kg/day	1.0E-05	mg/kg/day	0.1
				Vanadium	6.6E+01	mg/kg	4.6E-06	mg/kg/day	NA	NA	NA	1.3E-05	mg/kg/day	5.0E-03	mg/kg/day	0.003
				Aroclor-1254	2.6E-01	mg/kg	1.8E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	3.6E-08	5.3E-08	mg/kg/day	2.0E-05	mg/kg/day	0.003
				Benzo(a)pyrene	1.1E-01	mg/kg	7.7E-09	mg/kg/day	7.3E+00	1/(mg/kg/day)	5.6E-08	2.2E-08	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	1.6E-01	mg/kg	1.1E-08	mg/kg/day	7.3E-01	1/(mg/kg/day)	8.2E-09	3.3E-08	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	1.2E+01	mg/kg	8.4E-07	mg/kg/day	5.0E-01	1/(mg/kg/day)	4.2E-07	2.4E-06	mg/kg/day	3.0E-03	mg/kg/day	8.1E-04
			Exp. Route Total								1.3E-06					0.1
Sediment	Sediment	Sediment	Dermal	Aluminum	1.4E+04	mg/kg	--	--	NA	NA	NA	--	--	1.0E+00	mg/kg/day	NA
				Antimony	3.9E+00	mg/kg	--	--	NA	NA	NA	--	--	4.0E-04	mg/kg/day	NA
				Arsenic	7.8E+00	mg/kg	6.7E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.0E-06	2.0E-06	mg/kg/day	3.0E-04	mg/kg/day	0.007
				Cobalt	9.0E+00	mg/kg	--	--	NA	NA	NA	--	--	3.0E-04	mg/kg/day	NA
				Iron	4.6E+04	mg/kg	--	--	NA	NA	NA	--	--	7.0E-01	mg/kg/day	NA
				Lead	2.3E+02	mg/kg	--	--	NA	NA	NA	--	--	NA	NA	NA
				Manganese	3.6E+02	mg/kg	--	--	NA	NA	NA	--	--	9.6E-04	mg/kg/day	NA
				Thallium	5.2E+00	mg/kg	--	--	NA	NA	NA	--	--	1.0E-05	mg/kg/day	NA
				Vanadium	6.6E+01	mg/kg	--	--	NA	NA	NA	--	--	1.3E-04	mg/kg/day	NA
				Aroclor-1254	2.6E-01	mg/kg	1.0E-07	mg/kg/day	2.0E+00	1/(mg/kg/day)	2.1E-07	3.0E-07	mg/kg/day	2.0E-05	mg/kg/day	0.02
				Benzo(a)pyrene	1.1E-01	mg/kg	4.1E-08	mg/kg/day	7.3E+00	1/(mg/kg/day)	3.0E-07	1.2E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	1.6E-01	mg/kg	6.0E-08	mg/kg/day	7.3E-01	1/(mg/kg/day)	4.3E-08	1.7E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	1.2E+01	mg/kg	--	--	2.0E+01	1/(mg/kg/day)	NA	--	--	7.5E-05	mg/kg/day	NA
			Exp. Route Total								1.6E-06					0.02
		Exposure Point Total									2.9E-06					0.2
	Exposure Medium Total										2.9E-06					0.2
Sediment Total											2.9E-06					0.2
Receptor Total											1.7E-04					6

Notes:
NA = Not applicable.

TABLE 7.1.RME SUPPLEMENT A
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Water Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Antimony	1.0E+01	1.0E-03	NA	NA	NA	NA	4.0	4.1E-08	1
Cadmium	1.6E+01	1.0E-03	NA	NA	NA	NA	4.0	6.4E-08	1
Thallium	1.2E+02	1.0E-03	NA	NA	NA	NA	4.0	4.8E-07	1
Chromium (hexavalent)	4.1E+01	2.0E-03	NA	NA	NA	NA	4.0	3.3E-07	1

Inorganics: DAevent (mg/cm^2-event) =

$$DA_{event} = Kp \times CW \times tevent \times 0.001\ mg/ug \times 0.001\ l/cm^3 \quad \text{(Eq 1)}$$

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005
NA - Not applicable.
t* - Time to reach steady-state
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Aluminum	1.6E+04	mg/kg	1.7E-03	mg/kg/day	NA	NA	NA	1.2E-02	mg/kg/day	1.0E+00	mg/kg/day	0.01
				Arsenic	1.8E+00	mg/kg	1.9E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.8E-07	1.3E-06	mg/kg/day	3.0E-04	mg/kg/day	0.004
				Cobalt	1.7E+01	mg/kg	1.7E-06	mg/kg/day	NA	NA	NA	1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	0.04
				Iron	3.2E+04	mg/kg	3.4E-03	mg/kg/day	NA	NA	NA	2.4E-02	mg/kg/day	7.0E-01	mg/kg/day	0.03
				Manganese	9.6E+02	mg/kg	1.0E-04	mg/kg/day	NA	NA	NA	7.0E-04	mg/kg/day	2.4E-02	mg/kg/day	0.03
				Vanadium	1.1E+02	mg/kg	1.1E-05	mg/kg/day	NA	NA	NA	7.9E-05	mg/kg/day	5.0E-03	mg/kg/day	0.02
				Aroclor-1254	1.2E-01	mg/kg	1.3E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	2.5E-08	8.8E-08	mg/kg/day	2.0E-05	mg/kg/day	0.004
				Benzo(a)pyrene	1.2E-01	mg/kg	1.3E-08	mg/kg/day	2.2E+01	1/(mg/kg/day)	2.8E-07	8.9E-08	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	2.2E-08	mg/kg/day	2.2E+00	1/(mg/kg/day)	4.9E-08	1.6E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	2.5E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	3.7E-07	1.7E-06	mg/kg/day	3.0E-03	mg/kg/day	5.8E-04
			Exp. Route Total								1.0E-06					0.1
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Dermal	Aluminum	1.6E+04	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	1.0E+00	mg/kg/day	NA
				Arsenic	1.8E+00	mg/kg	4.6E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	6.9E-08	3.2E-07	mg/kg/day	3.0E-04	mg/kg/day	0.001
				Cobalt	1.7E+01	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	3.0E-04	mg/kg/day	NA
				Iron	3.2E+04	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	7.0E-01	mg/kg/day	NA
				Manganese	9.6E+02	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	9.6E-04	mg/kg/day	NA
				Vanadium	1.1E+02	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	1.3E-04	mg/kg/day	NA
				Aroclor-1254	1.2E-01	mg/kg	1.4E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	2.9E-08	1.0E-07	mg/kg/day	2.0E-05	mg/kg/day	0.005
				Benzo(a)pyrene	1.2E-01	mg/kg	1.4E-08	mg/kg/day	2.2E+01	1/(mg/kg/day)	3.0E-07	9.5E-08	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	2.4E-08	mg/kg/day	2.2E+00	1/(mg/kg/day)	5.2E-08	1.7E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	--	--	6.0E+01	1/(mg/kg/day)	NA	--	mg/kg/day	7.5E-05	mg/kg/day	NA
			Exp. Route Total								4.5E-07					0.006
		Exposure Point Total									1.5E-06					0.1
	Exposure Medium Total										1.5E-06					0.1

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Aluminum	1.7E-05	mg/m^3	1.2E-07	mg/m^3	NA	NA	NA	8.1E-07	mg/m^3	5.0E-03	mg/m3	1.6E-04
				Arsenic	1.9E-09	mg/m^3	1.3E-11	mg/m^3	4.3E-03	1/(ug/m3)	5.5E-11	9.0E-11	mg/m^3	1.5E-05	mg/m3	6.0E-06
				Cobalt	1.7E-08	mg/m^3	1.2E-10	mg/m^3	9.0E-03	1/(ug/m3)	1.1E-09	8.3E-10	mg/m^3	6.0E-06	mg/m3	1.4E-04
				Iron	3.4E-05	mg/m^3	2.3E-07	mg/m^3	NA	NA	NA	1.6E-06	mg/m^3	NA	NA	NA
				Manganese	1.0E-06	mg/m^3	6.9E-09	mg/m^3	NA	NA	NA	4.8E-08	mg/m^3	5.0E-05	mg/m3	9.6E-04
				Vanadium	1.1E-07	mg/m^3	7.7E-10	mg/m^3	NA	NA	NA	5.4E-09	mg/m^3	NA	NA	NA
				Aroclor-1254	1.3E-10	mg/m^3	8.6E-13	mg/m^3	5.7E-04	1/(ug/m3)	4.9E-13	6.0E-12	mg/m^3	NA	NA	NA
				Benzo(a)pyrene	1.3E-10	mg/m^3	8.7E-13	mg/m^3	3.3E-03	1/(ug/m3)	2.9E-12	6.1E-12	mg/m^3	NA	NA	NA
				Benzo(b)fluoranthene	2.2E-10	mg/m^3	1.5E-12	mg/m^3	3.3E-04	1/(ug/m3)	5.0E-13	1.1E-11	mg/m^3	NA	NA	NA
				Chromium (hexavalent)	2.5E-09	mg/m^3	1.7E-11	mg/m^3	2.5E-01	1/(ug/m3)	4.3E-09	1.2E-10	mg/m^3	1.0E-04	mg/m3	1.2E-06
			Exp. Route Total								5.4E-09					0.001
		Exposure Point Total									5.4E-09					0.001
	Exposure Medium Total										5.4E-09					0.001
Soil Total											1.5E-06					0.1
Surface Water	Surface Water	Surface Water	Ingestion	Antimony	1.0E+01	ug/L	4.3E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	3.0E-06	mg/kg/day	4.0E-04	mg/kg/day	0.008
				Cadmium	1.6E+01	ug/L	6.6E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	4.6E-06	mg/kg/day	5.0E-04	mg/kg/day	0.009
				Thallium	1.2E+02	ug/L	5.1E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	3.5E-05	mg/kg/day	1.0E-05	mg/kg/day	4
				Chromium (hexavalent)	4.1E+01	ug/L	1.7E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.6E-06	1.2E-05	mg/kg/day	3.0E-03	mg/kg/day	0.004
			Exp. Route Total								2.6E-06					4
Surface Water	Surface Water	Surface Water	Dermal	Antimony	1.0E+01	ug/L	5.3E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	3.7E-06	mg/kg/day	4.0E-04	mg/kg/day	0.009
				Cadmium	1.6E+01	ug/L	8.2E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	5.7E-06	mg/kg/day	2.5E-05	mg/kg/day	0.2
				Thallium	1.2E+02	ug/L	6.2E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	4.4E-05	mg/kg/day	1.0E-05	mg/kg/day	4
				Chromium (hexavalent)	4.1E+01	ug/L	4.2E-06	mg/kg/day	6.0E+01	1/(mg/kg-day)	2.5E-04	3.0E-05	mg/kg/day	7.5E-05	mg/kg/day	0.4
			Exp. Route Total								2.5E-04					5
		Exposure Point Total									2.6E-04					9
	Exposure Medium Total										2.6E-04					9
Surface Water Total											2.6E-04					9

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Ingestion	Aluminum	1.4E+04	mg/kg	7.5E-04	mg/kg/day	NA	NA	NA	5.3E-03	mg/kg/day	1.0E+00	mg/kg/day	0.005
				Antimony	3.9E+00	mg/kg	2.0E-07	mg/kg/day	NA	NA	NA	1.4E-06	mg/kg/day	4.0E-04	mg/kg/day	0.004
				Arsenic	7.8E+00	mg/kg	4.1E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	6.1E-07	2.8E-06	mg/kg/day	3.0E-04	mg/kg/day	0.009
				Cobalt	9.0E+00	mg/kg	4.7E-07	mg/kg/day	NA	NA	NA	3.3E-06	mg/kg/day	3.0E-04	mg/kg/day	0.01
				Iron	4.6E+04	mg/kg	2.4E-03	mg/kg/day	NA	NA	NA	1.7E-02	mg/kg/day	7.0E-01	mg/kg/day	0.02
				Lead	2.3E+02	mg/kg	1.2E-05	mg/kg/day	NA	NA	NA	8.5E-05	mg/kg/day	NA	NA	NA
				Manganese	3.6E+02	mg/kg	1.9E-05	mg/kg/day	NA	NA	NA	1.3E-04	mg/kg/day	2.4E-02	mg/kg/day	0.005
				Thallium	5.2E+00	mg/kg	2.7E-07	mg/kg/day	NA	NA	NA	1.9E-06	mg/kg/day	1.0E-05	mg/kg/day	0.2
				Vanadium	6.6E+01	mg/kg	3.4E-06	mg/kg/day	NA	NA	NA	2.4E-05	mg/kg/day	5.0E-03	mg/kg/day	0.005
				Aroclor-1254	2.6E-01	mg/kg	1.4E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	2.7E-08	9.5E-08	mg/kg/day	2.0E-05	mg/kg/day	0.005
				Benzo(a)pyrene	1.1E-01	mg/kg	5.7E-09	mg/kg/day	2.2E+01	1/(mg/kg/day)	1.3E-07	4.0E-08	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	1.6E-01	mg/kg	8.3E-09	mg/kg/day	2.2E+00	1/(mg/kg/day)	1.8E-08	5.8E-08	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	1.2E+01	mg/kg	6.3E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	9.4E-07	4.4E-06	mg/kg/day	3.0E-03	mg/kg/day	0.001
			Exp. Route Total								1.7E-06					0.3
Sediment	Sediment	Sediment	Dermal	Aluminum	1.4E+04	mg/kg	--	--	NA	NA	NA	--	--	1.0E+00	mg/kg/day	NA
				Antimony	3.9E+00	mg/kg	--	--	NA	NA	NA	--	--	4.0E-04	mg/kg/day	NA
				Arsenic	7.8E+00	mg/kg	3.6E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	5.4E-07	2.5E-06	mg/kg/day	3.0E-04	mg/kg/day	0.008
				Cobalt	9.0E+00	mg/kg	--	--	NA	NA	NA	--	--	3.0E-04	mg/kg/day	NA
				Iron	4.6E+04	mg/kg	--	--	NA	NA	NA	--	--	7.0E-01	mg/kg/day	NA
				Lead	2.3E+02	mg/kg	--	--	NA	NA	NA	--	--	NA	NA	NA
				Manganese	3.6E+02	mg/kg	--	--	NA	NA	NA	--	--	9.6E-04	mg/kg/day	NA
				Thallium	5.2E+00	mg/kg	--	--	NA	NA	NA	--	--	1.0E-05	mg/kg/day	NA
				Vanadium	6.6E+01	mg/kg	--	--	NA	NA	NA	--	--	1.3E-04	mg/kg/day	NA
				Aroclor-1254	2.6E-01	mg/kg	5.6E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	1.1E-07	3.9E-07	mg/kg/day	2.0E-05	mg/kg/day	0.02
				Benzo(a)pyrene	1.1E-01	mg/kg	2.2E-08	mg/kg/day	2.2E+01	1/(mg/kg/day)	4.8E-07	1.5E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	1.6E-01	mg/kg	3.2E-08	mg/kg/day	2.2E+00	1/(mg/kg/day)	7.0E-08	2.2E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	1.2E+01	mg/kg	--	--	6.0E+01	1/(mg/kg/day)	NA	--	--	7.5E-05	mg/kg/day	NA
			Exp. Route Total								1.2E-06					0.03
		Exposure Point Total									2.9E-06					0.3
	Exposure Medium Total										2.9E-06					0.3
Sediment Total											2.9E-06					0.3
Receptor Total											2.6E-04					9

Notes:
NA = Not applicable.

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Aluminum	1.6E+04	mg/kg	5.3E-03	mg/kg/day	NA	NA	NA	6.2E-02	mg/kg/day	1.0E+00	mg/kg/day	0.06
				Arsenic	1.8E+00	mg/kg	5.9E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	8.8E-07	6.8E-06	mg/kg/day	3.0E-04	mg/kg/day	0.02
				Cobalt	1.7E+01	mg/kg	5.4E-06	mg/kg/day	NA	NA	NA	6.3E-05	mg/kg/day	3.0E-04	mg/kg/day	0.2
				Iron	3.2E+04	mg/kg	1.0E-02	mg/kg/day	NA	NA	NA	1.2E-01	mg/kg/day	7.0E-01	mg/kg/day	0.2
				Manganese	9.6E+02	mg/kg	3.1E-04	mg/kg/day	NA	NA	NA	3.7E-03	mg/kg/day	2.4E-02	mg/kg/day	0.2
				Vanadium	1.1E+02	mg/kg	3.5E-05	mg/kg/day	NA	NA	NA	4.1E-04	mg/kg/day	5.0E-03	mg/kg/day	0.08
				Aroclor-1254	1.2E-01	mg/kg	3.9E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	7.8E-08	4.6E-07	mg/kg/day	2.0E-05	mg/kg/day	0.02
				Benzo(a)pyrene	1.2E-01	mg/kg	4.0E-08	mg/kg/day	7.3E+00	1/(mg/kg/day)	2.0E-06	4.6E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	6.9E-08	mg/kg/day	7.3E-01	1/(mg/kg/day)	3.5E-07	8.1E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	7.8E-07	mg/kg/day	5.0E-01	1/(mg/kg/day)	2.6E-06	9.0E-06	mg/kg/day	3.0E-03	mg/kg/day	0.003
			Exp. Route Total								5.9E-06					0.7
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Dermal	Aluminum	1.6E+04	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	1.0E+00	mg/kg/day	NA
				Arsenic	1.8E+00	mg/kg	4.9E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	7.4E-08	5.7E-07	mg/kg/day	3.0E-04	mg/kg/day	0.002
				Cobalt	1.7E+01	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	3.0E-04	mg/kg/day	NA
				Iron	3.2E+04	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	7.0E-01	mg/kg/day	NA
				Manganese	9.6E+02	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	9.6E-04	mg/kg/day	NA
				Vanadium	1.1E+02	mg/kg	--	--	NA	NA	NA	--	mg/kg/day	1.3E-04	mg/kg/day	NA
				Aroclor-1254	1.2E-01	mg/kg	1.5E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	3.1E-08	1.8E-07	mg/kg/day	2.0E-05	mg/kg/day	0.009
				Benzo(a)pyrene	1.2E-01	mg/kg	1.4E-08	mg/kg/day	7.3E+00	1/(mg/kg/day)	6.9E-07	1.7E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	2.5E-08	mg/kg/day	7.3E-01	1/(mg/kg/day)	1.2E-07	2.9E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	--	--	2.0E+01	1/(mg/kg/day)	NA	--	mg/kg/day	7.5E-05	mg/kg/day	NA
			Exp. Route Total								9.1E-07					0.01
		Exposure Point Total									6.8E-06					0.7
	Exposure Medium Total										6.8E-06					0.7

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Aluminum	1.7E-05	mg/m^3	6.9E-08	mg/m^3	NA	NA	NA	8.1E-07	mg/m^3	5.0E-03	mg/m3	1.6E-04
				Arsenic	1.9E-09	mg/m^3	7.7E-12	mg/m^3	4.3E-03	1/(ug/m3)	3.3E-11	9.0E-11	mg/m^3	1.5E-05	mg/m3	6.0E-06
				Cobalt	1.7E-08	mg/m^3	7.1E-11	mg/m^3	9.0E-03	1/(ug/m3)	6.4E-10	8.3E-10	mg/m^3	6.0E-06	mg/m3	1.4E-04
				Iron	3.4E-05	mg/m^3	1.4E-07	mg/m^3	NA	NA	NA	1.6E-06	mg/m^3	NA	NA	NA
				Manganese	1.0E-06	mg/m^3	4.1E-09	mg/m^3	NA	NA	NA	4.8E-08	mg/m^3	5.0E-05	mg/m3	9.6E-04
				Vanadium	1.1E-07	mg/m^3	4.6E-10	mg/m^3	NA	NA	NA	5.4E-09	mg/m^3	NA	NA	NA
				Aroclor-1254	1.3E-10	mg/m^3	5.1E-13	mg/m^3	5.7E-04	1/(ug/m3)	2.9E-13	6.0E-12	mg/m^3	NA	NA	NA
				Benzo(a)pyrene	1.3E-10	mg/m^3	5.2E-13	mg/m^3	1.1E-03	1/(ug/m3)	3.1E-12	6.1E-12	mg/m^3	NA	NA	NA
				Benzo(b)fluoranthene	2.2E-10	mg/m^3	9.1E-13	mg/m^3	1.1E-04	1/(ug/m3)	5.4E-13	1.1E-11	mg/m^3	NA	NA	NA
				Chromium (hexavalent)	2.5E-09	mg/m^3	1.0E-11	mg/m^3	8.4E-02	1/(ug/m3)	4.6E-09	1.2E-10	mg/m^3	1.0E-04	mg/m3	1.2E-06
			Exp. Route Total								5.2E-09					0.001
		Exposure Point Total									5.2E-09					0.001
	Exposure Medium Total										5.2E-09					0.001
Soil Total											6.8E-06					0.7
Surface Water	Surface Water	Surface Water	Ingestion	Antimony	1.0E+01	ug/L	6.7E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	7.8E-06	mg/kg/day	4.0E-04	mg/kg/day	0.02
				Cadmium	1.6E+01	ug/L	1.0E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-05	mg/kg/day	5.0E-04	mg/kg/day	0.02
				Thallium	1.2E+02	ug/L	7.9E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	9.2E-05	mg/kg/day	1.0E-05	mg/kg/day	9
				Chromium (hexavalent)	4.1E+01	ug/L	2.7E-06	mg/kg/day	5.0E-01	1/(mg/kg-day)	9.1E-06	3.1E-05	mg/kg/day	3.0E-03	mg/kg/day	0.01
			Exp. Route Total								9.1E-06					9
Surface Water	Surface Water	Surface Water	Dermal	Antimony	1.0E+01	ug/L	4.5E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	5.2E-06	mg/kg/day	4.0E-04	mg/kg/day	0.01
				Cadmium	1.6E+01	ug/L	6.9E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	8.1E-06	mg/kg/day	2.5E-05	mg/kg/day	0.3
				Thallium	1.2E+02	ug/L	5.3E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	6.1E-05	mg/kg/day	1.0E-05	mg/kg/day	6
				Chromium (hexavalent)	4.1E+01	ug/L	3.6E-06	mg/kg/day	2.0E+01	1/(mg/kg-day)	4.5E-04	4.2E-05	mg/kg/day	7.5E-05	mg/kg/day	0.6
			Exp. Route Total								4.5E-04					7
		Exposure Point Total									4.6E-04					16
	Exposure Medium Total										4.6E-04					16
Surface Water Total											4.6E-04					16

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Ingestion	Aluminum	1.4E+04	mg/kg	1.2E-03	mg/kg/day	NA	NA	NA	1.4E-02	mg/kg/day	1.0E+00	mg/kg/day	0.01
				Antimony	3.9E+00	mg/kg	3.2E-07	mg/kg/day	NA	NA	NA	3.7E-06	mg/kg/day	4.0E-04	mg/kg/day	0.009
				Arsenic	7.8E+00	mg/kg	6.3E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	9.5E-07	7.4E-06	mg/kg/day	3.0E-04	mg/kg/day	0.02
				Cobalt	9.0E+00	mg/kg	7.3E-07	mg/kg/day	NA	NA	NA	8.5E-06	mg/kg/day	3.0E-04	mg/kg/day	0.03
				Iron	4.6E+04	mg/kg	3.7E-03	mg/kg/day	NA	NA	NA	4.4E-02	mg/kg/day	7.0E-01	mg/kg/day	0.06
				Lead	2.3E+02	mg/kg	1.9E-05	mg/kg/day	NA	NA	NA	2.2E-04	mg/kg/day	NA	NA	NA
				Manganese	3.6E+02	mg/kg	2.9E-05	mg/kg/day	NA	NA	NA	3.4E-04	mg/kg/day	2.4E-02	mg/kg/day	0.01
				Thallium	5.2E+00	mg/kg	4.2E-07	mg/kg/day	NA	NA	NA	4.9E-06	mg/kg/day	1.0E-05	mg/kg/day	0.5
				Vanadium	6.6E+01	mg/kg	5.4E-06	mg/kg/day	NA	NA	NA	6.3E-05	mg/kg/day	5.0E-03	mg/kg/day	0.01
				Aroclor-1254	2.6E-01	mg/kg	2.1E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	4.2E-08	2.5E-07	mg/kg/day	2.0E-05	mg/kg/day	0.01
				Benzo(a)pyrene	1.1E-01	mg/kg	9.0E-09	mg/kg/day	7.3E+00	1/(mg/kg/day)	4.5E-07	1.0E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	1.6E-01	mg/kg	1.3E-08	mg/kg/day	7.3E-01	1/(mg/kg/day)	6.5E-08	1.5E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	1.2E+01	mg/kg	9.8E-07	mg/kg/day	5.0E-01	1/(mg/kg/day)	3.3E-06	1.1E-05	mg/kg/day	3.0E-03	mg/kg/day	0.004
			Exp. Route Total								4.8E-06					0.7
Sediment	Sediment	Sediment	Dermal	Aluminum	1.4E+04	mg/kg	--	--	NA	NA	NA	--	--	1.0E+00	mg/kg/day	NA
				Antimony	3.9E+00	mg/kg	--	--	NA	NA	NA	--	--	4.0E-04	mg/kg/day	NA
				Arsenic	7.8E+00	mg/kg	3.8E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	5.8E-07	4.5E-06	mg/kg/day	3.0E-04	mg/kg/day	0.01
				Cobalt	9.0E+00	mg/kg	--	--	NA	NA	NA	--	--	3.0E-04	mg/kg/day	NA
				Iron	4.6E+04	mg/kg	--	--	NA	NA	NA	--	--	7.0E-01	mg/kg/day	NA
				Lead	2.3E+02	mg/kg	--	--	NA	NA	NA	--	--	NA	NA	NA
				Manganese	3.6E+02	mg/kg	--	--	NA	NA	NA	--	--	9.6E-04	mg/kg/day	NA
				Thallium	5.2E+00	mg/kg	--	--	NA	NA	NA	--	--	1.0E-05	mg/kg/day	NA
				Vanadium	6.6E+01	mg/kg	--	--	NA	NA	NA	--	--	1.3E-04	mg/kg/day	NA
				Aroclor-1254	2.6E-01	mg/kg	6.0E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	1.2E-07	7.0E-07	mg/kg/day	2.0E-05	mg/kg/day	0.03
				Benzo(a)pyrene	1.1E-01	mg/kg	2.3E-08	mg/kg/day	7.3E+00	1/(mg/kg/day)	1.1E-06	2.7E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	1.6E-01	mg/kg	3.4E-08	mg/kg/day	7.3E-01	1/(mg/kg/day)	1.6E-07	4.0E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	1.2E+01	mg/kg	--	--	2.0E+01	1/(mg/kg/day)	NA	--	--	7.5E-05	mg/kg/day	NA
			Exp. Route Total								2.0E-06					0.05
		Exposure Point Total									6.8E-06					0.7
	Exposure Medium Total										6.8E-06					0.7
Sediment Total											6.8E-06					0.7
Receptor Total											4.7E-04					18

Notes:
NA = Not applicable.

TABLE 7.3.RME Supplement A

CALCULATION OF CHEMICAL CANCER RISKS FOR COPC WITH MUTAGENIC MODE OF ACTION

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations						
							Intake/Exposure Concentration			CSF/Unit Risk			
							Value		Units	Value		Units	Cancer Risk
					Value	Units	0-2 yrs	2-6 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)		
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Benzo(a)pyrene	1.2E-01	mg/kg	2.0E-08	2.5E-08	mg/kg/day	7.3E+01	2.2E+01	1/(mg/kg-day)	2.0E-06
				Benzo(b)fluoranthene	2.1E-01	mg/kg	3.4E-08	4.3E-08	mg/kg/day	7.3E+00	2.2E+00	1/(mg/kg-day)	3.5E-07
				Chromium (hexavalent)	2.4E+00	mg/kg	3.8E-07	4.8E-07	mg/kg/day	5.0E+00	1.5E+00	1/(mg/kg-day)	2.6E-06
			Dermal	Benzo(a)pyrene	1.2E-01	mg/kg	6.7E-09	9.3E-09	mg/kg/day	7.3E+01	2.2E+01	1/(mg/kg-day)	6.9E-07
				Benzo(b)fluoranthene	2.1E-01	mg/kg	1.2E-08	1.6E-08	mg/kg/day	7.3E+00	2.2E+00	1/(mg/kg-day)	1.2E-07
				Chromium (hexavalent)	2.4E+00	mg/kg	--	--	mg/kg/day	2.0E+02	6.0E+01	1/(mg/kg-day)	--
	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Benzo(a)pyrene	1.3E-10	mg/m^3	1.7E-13	3.5E-13	mg/m^3	1.1E-02	3.3E-03	$1/(ug/m^3)$	3.1E-12
				Benzo(b)fluoranthene	2.2E-10	mg/m^3	3.0E-13	6.1E-13	mg/m^3	1.1E-03	3.3E-04	$1/(ug/m^3)$	5.4E-13
				Chromium (hexavalent)	2.5E-09	mg/m^3	3.4E-12	6.8E-12	mg/m^3	8.4E-01	2.5E-01	$1/(ug/m^3)$	4.6E-09
Surface Water	Surface Water	Surface Water	Ingestion	Chromium (hexavalent)	4.1E+01	ug/L	1.3E-06	1.7E-06	mg/kg/day	5.0E+00	1.5E+00	1/(mg/kg-day)	9.1E-06
			Dermal	Chromium (hexavalent)	4.1E+01	ug/L	1.6E-06	2.3E-06	mg/kg/day	2.0E+02	6.0E+01	1/(mg/kg-day)	4.5E-04
Sediment	Sediment	Sediment	Ingestion	Benzo(a)pyrene	1.1E-01	mg/kg	4.4E-09	5.6E-09	mg/kg/day	7.3E+01	2.2E+01	1/(mg/kg-day)	4.5E-07
				Benzo(b)fluoranthene	1.6E-01	mg/kg	6.5E-09	8.1E-09	mg/kg/day	7.3E+00	2.2E+00	1/(mg/kg-day)	6.5E-08
				Chromium (hexavalent)	1.2E+01	mg/kg	4.8E-07	6.1E-07	mg/kg/day	5.0E+00	1.5E+00	1/(mg/kg-day)	3.3E-06
			Dermal	Benzo(a)pyrene	1.1E-01	mg/kg	1.1E-08	1.5E-08	mg/kg/day	7.3E+01	2.2E+01	1/(mg/kg-day)	1.1E-06
				Benzo(b)fluoranthene	1.6E-01	mg/kg	1.6E-08	2.2E-08	mg/kg/day	7.3E+00	2.2E+00	1/(mg/kg-day)	1.6E-07
				Chromium (hexavalent)	1.2E+01	mg/kg	--	--	mg/kg/day	2.0E+02	6.0E+01	1/(mg/kg-day)	--

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Aluminum	1.6E+04	mg/kg	NA	NA	NA	NA	NA	2.2E-02	mg/kg/day	1.0E+00	mg/kg/day	0.02
				Arsenic	1.8E+00	mg/kg	NA	NA	NA	NA	NA	2.5E-06	mg/kg/day	3.0E-04	mg/kg/day	0.008
				Cobalt	1.7E+01	mg/kg	NA	NA	NA	NA	NA	2.3E-05	mg/kg/day	3.0E-04	mg/kg/day	0.08
				Iron	3.2E+04	mg/kg	NA	NA	NA	NA	NA	4.4E-02	mg/kg/day	7.0E-01	mg/kg/day	0.06
				Manganese	9.6E+02	mg/kg	NA	NA	NA	NA	NA	1.3E-03	mg/kg/day	2.4E-02	mg/kg/day	0.05
				Vanadium	1.1E+02	mg/kg	NA	NA	NA	NA	NA	1.5E-04	mg/kg/day	5.0E-03	mg/kg/day	0.03
				Aroclor-1254	1.2E-01	mg/kg	NA	NA	NA	NA	NA	1.6E-07	mg/kg/day	2.0E-05	mg/kg/day	0.008
				Benzo(a)pyrene	1.2E-01	mg/kg	NA	NA	NA	NA	NA	1.7E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	NA	NA	NA	NA	NA	2.9E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	NA	NA	NA	NA	NA	3.3E-06	mg/kg/day	3.0E-03	mg/kg/day	0.001
			Exp. Route Total								NA					0.3
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Dermal	Aluminum	1.6E+04	mg/kg	NA	NA	NA	NA	NA	--	--	1.0E+00	mg/kg/day	NA
				Arsenic	1.8E+00	mg/kg	NA	NA	NA	NA	NA	3.0E-07	mg/kg/day	3.0E-04	mg/kg/day	9.8E-04
				Cobalt	1.7E+01	mg/kg	NA	NA	NA	NA	NA	--	--	3.0E-04	mg/kg/day	NA
				Iron	3.2E+04	mg/kg	NA	NA	NA	NA	NA	--	--	7.0E-01	mg/kg/day	NA
				Manganese	9.6E+02	mg/kg	NA	NA	NA	NA	NA	--	--	9.6E-04	mg/kg/day	NA
				Vanadium	1.1E+02	mg/kg	NA	NA	NA	NA	NA	--	--	1.3E-04	mg/kg/day	NA
				Aroclor-1254	1.2E-01	mg/kg	NA	NA	NA	NA	NA	9.2E-08	mg/kg/day	2.0E-05	mg/kg/day	0.005
				Benzo(a)pyrene	1.2E-01	mg/kg	NA	NA	NA	NA	NA	8.7E-08	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	NA	NA	NA	NA	NA	1.5E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	NA	NA	NA	NA	NA	--	--	7.5E-05	mg/kg/day	NA
			Exp. Route Total								NA					0.006
		Exposure Point Total									NA					0.3
	Exposure Medium Total										NA					0.3

TABLE 7.4.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Aluminum	1.7E-05	mg/m^3	NA	NA	NA	NA	NA	1.6E-05	mg/m^3	5.0E-03	mg/m3	0.003
				Arsenic	1.9E-09	mg/m^3	NA	NA	NA	NA	NA	1.8E-09	mg/m^3	1.5E-05	mg/m3	1.2E-04
				Cobalt	1.7E-08	mg/m^3	NA	NA	NA	NA	NA	1.7E-08	mg/m^3	6.0E-06	mg/m3	0.003
				Iron	3.4E-05	mg/m^3	NA	NA	NA	NA	NA	3.3E-05	mg/m^3	NA	NA	NA
				Manganese	1.0E-06	mg/m^3	NA	NA	NA	NA	NA	9.7E-07	mg/m^3	5.0E-05	mg/m3	0.02
				Vanadium	1.1E-07	mg/m^3	NA	NA	NA	NA	NA	1.1E-07	mg/m^3	NA	NA	NA
				Aroclor-1254	1.3E-10	mg/m^3	NA	NA	NA	NA	NA	1.2E-10	mg/m^3	NA	NA	NA
				Benzo(a)pyrene	1.3E-10	mg/m^3	NA	NA	NA	NA	NA	1.2E-10	mg/m^3	NA	NA	NA
				Benzo(b)fluoranthene	2.2E-10	mg/m^3	NA	NA	NA	NA	NA	2.2E-10	mg/m^3	NA	NA	NA
				Chromium (hexavalent)	2.5E-09	mg/m^3	NA	NA	NA	NA	NA	2.4E-09	mg/m^3	1.0E-04	mg/m3	2.4E-05
			Exp. Route Total								NA					0.03
		Exposure Point Total									NA					0.03
	Exposure Medium Total										NA					0.03
Soil Total											NA					0.3
Receptor Total											NA					0.3

Notes:
NA = Not applicable.

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Aluminum	1.6E+04	mg/kg	NA	NA	NA	NA	NA	2.1E-01	mg/kg/day	1.0E+00	mg/kg/day	0.2
				Arsenic	1.8E+00	mg/kg	NA	NA	NA	NA	NA	2.3E-05	mg/kg/day	3.0E-04	mg/kg/day	0.08
				Cobalt	1.7E+01	mg/kg	NA	NA	NA	NA	NA	2.1E-04	mg/kg/day	3.0E-04	mg/kg/day	0.7
				Iron	3.2E+04	mg/kg	NA	NA	NA	NA	NA	4.1E-01	mg/kg/day	7.0E-01	mg/kg/day	0.6
				Manganese	9.6E+02	mg/kg	NA	NA	NA	NA	NA	1.2E-02	mg/kg/day	2.4E-02	mg/kg/day	0.5
				Vanadium	1.1E+02	mg/kg	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	5.0E-03	mg/kg/day	0.3
				Aroclor-1254	1.2E-01	mg/kg	NA	NA	NA	NA	NA	1.5E-06	mg/kg/day	2.0E-05	mg/kg/day	0.08
				Benzo(a)pyrene	1.2E-01	mg/kg	NA	NA	NA	NA	NA	1.6E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	NA	NA	NA	NA	NA	2.7E-06	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	NA	NA	NA	NA	NA	3.0E-05	mg/kg/day	3.0E-03	mg/kg/day	0.01
			Exp. Route Total								NA					2
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Dermal	Aluminum	1.6E+04	mg/kg	NA	NA	NA	NA	NA	--	--	1.0E+00	mg/kg/day	NA
				Arsenic	1.8E+00	mg/kg	NA	NA	NA	NA	NA	1.9E-06	mg/kg/day	3.0E-04	mg/kg/day	0.006
				Cobalt	1.7E+01	mg/kg	NA	NA	NA	NA	NA	--	--	3.0E-04	mg/kg/day	NA
				Iron	3.2E+04	mg/kg	NA	NA	NA	NA	NA	--	--	7.0E-01	mg/kg/day	NA
				Manganese	9.6E+02	mg/kg	NA	NA	NA	NA	NA	--	--	9.6E-04	mg/kg/day	NA
				Vanadium	1.1E+02	mg/kg	NA	NA	NA	NA	NA	--	--	1.3E-04	mg/kg/day	NA
				Aroclor-1254	1.2E-01	mg/kg	NA	NA	NA	NA	NA	6.0E-07	mg/kg/day	2.0E-05	mg/kg/day	0.03
				Benzo(a)pyrene	1.2E-01	mg/kg	NA	NA	NA	NA	NA	5.7E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	NA	NA	NA	NA	NA	9.9E-07	mg/kg/day	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	NA	NA	NA	NA	NA	--	--	7.5E-05	mg/kg/day	NA
			Exp. Route Total								NA					0.04
		Exposure Point Total									NA					2
	Exposure Medium Total										NA					2

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Aluminum	1.7E-05	mg/m^3	NA	NA	NA	NA	NA	1.6E-05	mg/m^3	5.0E-03	mg/m3	0.003
				Arsenic	1.9E-09	mg/m^3	NA	NA	NA	NA	NA	1.8E-09	mg/m^3	1.5E-05	mg/m3	1.2E-04
				Cobalt	1.7E-08	mg/m^3	NA	NA	NA	NA	NA	1.7E-08	mg/m^3	6.0E-06	mg/m3	0.003
				Iron	3.4E-05	mg/m^3	NA	NA	NA	NA	NA	3.3E-05	mg/m^3	NA	NA	NA
				Manganese	1.0E-06	mg/m^3	NA	NA	NA	NA	NA	9.7E-07	mg/m^3	5.0E-05	mg/m3	0.02
				Vanadium	1.1E-07	mg/m^3	NA	NA	NA	NA	NA	1.1E-07	mg/m^3	NA	NA	NA
				Aroclor-1254	1.3E-10	mg/m^3	NA	NA	NA	NA	NA	1.2E-10	mg/m^3	NA	NA	NA
				Benzo(a)pyrene	1.3E-10	mg/m^3	NA	NA	NA	NA	NA	1.2E-10	mg/m^3	NA	NA	NA
				Benzo(b)fluoranthene	2.2E-10	mg/m^3	NA	NA	NA	NA	NA	2.2E-10	mg/m^3	NA	NA	NA
				Chromium (hexavalent)	2.5E-09	mg/m^3	NA	NA	NA	NA	NA	2.4E-09	mg/m^3	1.0E-04	mg/m3	2.4E-05
			Exp. Route Total								NA					0.03
		Exposure Point Total									NA					0.03
	Exposure Medium Total										NA					0.03
Soil Total											NA					3
Receptor Total											NA					3

Notes:
NA = Not applicable.

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Aluminum	1.6E+04	mg/kg	2.5E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Arsenic	1.8E+00	mg/kg	2.8E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	4.2E-06	NA	NA	NA	NA	NA
				Cobalt	1.7E+01	mg/kg	2.6E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Iron	3.2E+04	mg/kg	5.0E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Manganese	9.6E+02	mg/kg	1.5E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Vanadium	1.1E+02	mg/kg	1.7E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Aroclor-1254	1.2E-01	mg/kg	1.9E-07	mg/kg/day	2.0E+00	1/(mg/kg/day)	3.8E-07	NA	NA	NA	NA	NA
				Benzo(a)pyrene	1.2E-01	mg/kg	1.9E-07	mg/kg/day	7.3E+00	1/(mg/kg/day)	7.9E-06	NA	NA	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	3.3E-07	mg/kg/day	7.3E-01	1/(mg/kg/day)	1.4E-06	NA	NA	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	3.7E-06	mg/kg/day	5.0E-01	1/(mg/kg/day)	1.1E-05	NA	NA	NA	NA	NA
			Exp. Route Total								2.5E-05					NA
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Dermal	Aluminum	1.6E+04	mg/kg	--	--	NA	NA	NA	NA	NA	NA	NA	NA
				Arsenic	1.8E+00	mg/kg	2.7E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	4.0E-07	NA	NA	NA	NA	NA
				Cobalt	1.7E+01	mg/kg	--	--	NA	NA	NA	NA	NA	NA	NA	NA
				Iron	3.2E+04	mg/kg	--	--	NA	NA	NA	NA	NA	NA	NA	NA
				Manganese	9.6E+02	mg/kg	--	--	NA	NA	NA	NA	NA	NA	NA	NA
				Vanadium	1.1E+02	mg/kg	--	--	NA	NA	NA	NA	NA	NA	NA	NA
				Aroclor-1254	1.2E-01	mg/kg	8.3E-08	mg/kg/day	2.0E+00	1/(mg/kg/day)	1.7E-07	NA	NA	NA	NA	NA
				Benzo(a)pyrene	1.2E-01	mg/kg	7.8E-08	mg/kg/day	7.3E+00	1/(mg/kg/day)	3.3E-06	NA	NA	NA	NA	NA
				Benzo(b)fluoranthene	2.1E-01	mg/kg	1.4E-07	mg/kg/day	7.3E-01	1/(mg/kg/day)	5.8E-07	NA	NA	NA	NA	NA
				Chromium (hexavalent)	2.4E+00	mg/kg	--	--	2.0E+01	1/(mg/kg/day)	NA	NA	NA	NA	NA	NA
			Exp. Route Total								4.5E-06					NA
		Exposure Point Total									2.9E-05					NA
	Exposure Medium Total										2.9E-05					NA

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Aluminum	1.7E-05	mg/m^3	7.0E-06	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Arsenic	1.9E-09	mg/m^3	7.8E-10	mg/m^3	4.3E-03	1/(ug/m3)	3.4E-09	NA	NA	NA	NA	NA
				Cobalt	1.7E-08	mg/m^3	7.1E-09	mg/m^3	9.0E-03	1/(ug/m3)	6.4E-08	NA	NA	NA	NA	NA
				Iron	3.4E-05	mg/m^3	1.4E-05	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Manganese	1.0E-06	mg/m^3	4.2E-07	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Vanadium	1.1E-07	mg/m^3	4.7E-08	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Aroclor-1254	1.3E-10	mg/m^3	5.2E-11	mg/m^3	5.7E-04	1/(ug/m3)	3.0E-11	NA	NA	NA	NA	NA
				Benzo(a)pyrene	1.3E-10	mg/m^3	5.3E-11	mg/m^3	1.1E-03	1/(ug/m3)	1.5E-10	NA	NA	NA	NA	NA
				Benzo(b)fluoranthene	2.2E-10	mg/m^3	9.2E-11	mg/m^3	1.1E-04	1/(ug/m3)	2.6E-11	NA	NA	NA	NA	NA
				Chromium (hexavalent)	2.5E-09	mg/m^3	1.0E-09	mg/m^3	8.4E-02	1/(ug/m3)	2.2E-07	NA	NA	NA	NA	NA
			Exp. Route Total								2.9E-07					NA
		Exposure Point Total									2.9E-07					NA
	Exposure Medium Total										2.9E-07					NA
Soil Total											2.9E-05					NA
Receptor Total											2.9E-05					NA

Notes:
NA = Not applicable.

TABLE 7.6.RME Supplement A
CALCULATION OF CHEMICAL CANCER RISKS FOR COPC WITH MUTAGENIC MODE OF ACTION
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations								
							Intake/Exposure Concentration				CSF/Unit Risk				
							Value			Units	Value			Units	Cancer Risk
					Value	Units	0-2 yrs	2-16 yrs	16-30 yrs		0-2 yrs (ADAF=10)	2-16 yrs (ADAF=3)	16-30 yrs (ADAF=1)		
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Benzo(a)pyrene	1.2E-01	mg/kg	6.6E-08	1.3E-07	3.5E-08	mg/kg/day	7.3E+01	2.2E+01	7.3E+00	1/(mg/kg-day)	7.9E-06
				Benzo(b)fluoranthene	2.1E-01	mg/kg	1.2E-07	2.3E-07	6.0E-08	mg/kg/day	7.3E+00	2.2E+00	7.3E-01	1/(mg/kg-day)	1.4E-06
				Chromium (hexavalent)	2.4E+00	mg/kg	1.3E-06	2.5E-06	6.7E-07	mg/kg/day	5.0E+00	1.5E+00	5.0E-01	1/(mg/kg-day)	1.1E-05
			Dermal	Benzo(a)pyrene	1.2E-01	mg/kg	2.2E-08	7.0E-08	1.8E-08	mg/kg/day	7.3E+01	2.2E+01	7.3E+00	1/(mg/kg-day)	3.3E-06
				Benzo(b)fluoranthene	2.1E-01	mg/kg	3.9E-08	1.2E-07	3.1E-08	mg/kg/day	7.3E+00	2.2E+00	7.3E-01	1/(mg/kg-day)	5.8E-07
				Chromium (hexavalent)	2.4E+00	mg/kg	--	--	0.0E+00	mg/kg/day	2.0E+02	6.0E+01	2.0E+01	1/(mg/kg-day)	--
	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Benzo(a)pyrene	1.3E-10	mg/m^3	3.5E-12	2.5E-11	2.5E-11	mg/m^3	1.1E-02	3.3E-03	1.1E-03	$1/(ug/m^3)$	1.5E-10
				Benzo(b)fluoranthene	2.2E-10	mg/m^3	6.1E-12	4.3E-11	4.3E-11	mg/m^3	1.1E-03	3.3E-04	1.1E-04	$1/(ug/m^3)$	2.6E-11
				Chromium (hexavalent)	2.5E-09	mg/m^3	6.9E-11	4.8E-10	4.8E-10	mg/m^3	8.4E-01	2.5E-01	8.4E-02	$1/(ug/m^3)$	2.2E-07

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Arsenic	1.8E+00	mg/kg	1.3E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.0E-07	3.7E-07	mg/kg/day	3.0E-04	mg/kg/day	0.001
			Exp. Route Total								2.0E-07					0.001
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Dermal	Arsenic	1.8E+00	mg/kg	2.6E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	3.9E-08	7.3E-08	mg/kg/day	3.0E-04	mg/kg/day	2.4E-04
			Exp. Route Total								3.9E-08					2.4E-04
		Exposure Point Total									2.4E-07					0.001
	Exposure Medium Total										2.4E-07					0.001
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Arsenic	1.9E-09	mg/m^3	3.2E-11	mg/m^3	4.3E-03	1/(ug/m3)	1.4E-10	9.0E-11	mg/m^3	1.5E-05	mg/m3	6.0E-06
			Exp. Route Total								1.4E-10					6.0E-06
		Exposure Point Total									1.4E-10					6.0E-06
	Exposure Medium Total										1.4E-10					6.0E-06
Soil Total											2.4E-07					0.001
Receptor Total											2.4E-07					0.001

Notes:
NA = Not applicable.

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Arsenic	1.8E+00	mg/kg	8.3E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.2E-07	5.8E-06	mg/kg/day	3.0E-04	mg/kg/day	0.02
			Exp. Route Total								1.2E-07					0.02
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Dermal	Arsenic	1.8E+00	mg/kg	7.5E-09	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.1E-08	5.2E-07	mg/kg/day	3.0E-04	mg/kg/day	0.002
			Exp. Route Total								1.1E-08					0.002
		Exposure Point Total									1.4E-07					0.02
	Exposure Medium Total										1.4E-07					0.02
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Arsenic	1.6E-07	mg/m^3	5.3E-10	mg/m^3	4.3E-03	1/(ug/m3)	2.3E-09	3.7E-08	mg/m^3	1.5E-05	mg/m3	0.002
			Exp. Route Total								2.3E-09					0.002
		Exposure Point Total									2.3E-09					0.002
	Exposure Medium Total										2.3E-09					0.002
Soil Total											1.4E-07					0.02
Receptor Total											1.4E-07					0.02

Notes:
NA = Not applicable.

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Ingestion	Arsenic	1.8E+00	mg/kg	6.3E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	9.4E-07	1.8E-06	mg/kg/day	3.0E-04	mg/kg/day	0.006
			Exp. Route Total								9.4E-07					0.006
			Dermal	Arsenic	1.8E+00	mg/kg	1.2E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.9E-07	3.5E-07	mg/kg/day	3.0E-04	mg/kg/day	0.001
			Exp. Route Total								1.9E-07					0.001
		Exposure Point Total									1.1E-06					0.007
	Exposure Medium Total										1.1E-06					0.007
Soil	Ambient Air	North Area Emissions from Surface Soil	Inhalation	Arsenic	1.9E-09	mg/m^3	1.5E-10	mg/m^3	4.3E-03	1/(ug/m3)	6.7E-10	4.3E-10	mg/m^3	1.5E-05	mg/m3	2.9E-05
			Exp. Route Total								6.7E-10					2.9E-05
		Exposure Point Total									6.7E-10					2.9E-05
	Exposure Medium Total										6.7E-10					2.9E-05
Soil Total											1.1E-06					0.007
Receptor Total											1.1E-06					0.007

Notes:
NA = Not applicable.

Table 7.10.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Fish	Ingestion	Cadmium	2.6E-01	mg/kg-fish	8.1E-05	mg/kg-day	NA	NA	NA	2.4E-04	mg/kg-day	1.0E-03	mg/kg-day	0.2
				Chromium	4.0E-01	mg/kg-fish	1.3E-04	mg/kg-day	NA	NA	NA	3.7E-04	mg/kg-day	1.5E+00	mg/kg-day	2.5E-04
				Copper	7.1E+00	mg/kg-fish	2.3E-03	mg/kg-day	NA	NA	NA	6.6E-03	mg/kg-day	4.0E-02	mg/kg-day	0.2
				Lead	5.2E-01	mg/kg-fish	1.6E-04	mg/kg-day	NA	NA	NA	4.8E-04	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.5E-03	mg/kg-day	NA	NA	NA	4.4E-03	mg/kg-day	2.0E-02	mg/kg-day	0.2
				Silver	7.4E-02	mg/kg-fish	2.3E-05	mg/kg-day	NA	NA	NA	6.8E-05	mg/kg-day	5.0E-03	mg/kg-day	0.01
				Zinc	1.7E+01	mg/kg-fish	5.4E-03	mg/kg-day	NA	NA	NA	1.6E-02	mg/kg-day	3.0E-01	mg/kg-day	0.1
				4,4'-DDD	8.9E-03	mg/kg-fish	2.8E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	6.8E-07	8.3E-06	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	2.6E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	8.7E-05	7.5E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	1.4E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.8E-08	4.1E-07	mg/kg-day	5.0E-04	mg/kg-day	8.2E-04
				Tetrachloroethene	1.7E-03	mg/kg-fish	5.3E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	1.1E-09	1.5E-06	mg/kg-day	6.0E-03	mg/kg-day	2.6E-04
				Dioxin-Like PCBs	2.0E-05	mg/kg-fish	6.2E-09	mg/kg-day	1.3E+05	1/(mg/kg-day)	8.1E-04	1.8E-08	mg/kg-day	7.0E-10	mg/kg-day	26
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	2.1E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	4.2E-04	6.1E-04	mg/kg-day	2.0E-05	mg/kg-day	31
			Exp. Route Total								1.3E-03					57
		Exposure Point Total									1.3E-03					57
	Exposure Medium Total										1.3E-03					57
Sediment Total											1.3E-03					57
Receptor Total											1.3E-03					57

NA = Not applicable.

Table 7.11.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Fish	Ingestion	Cadmium	2.6E-01	mg/kg-fish	6.1E-05	mg/kg-day	NA	NA	NA	4.2E-04	mg/kg-day	1.0E-03	mg/kg-day	0.4
				Chromium	4.0E-01	mg/kg-fish	9.4E-05	mg/kg-day	NA	NA	NA	6.6E-04	mg/kg-day	1.5E+00	mg/kg-day	4.4E-04
				Copper	7.1E+00	mg/kg-fish	1.7E-03	mg/kg-day	NA	NA	NA	1.2E-02	mg/kg-day	4.0E-02	mg/kg-day	0.3
				Lead	5.2E-01	mg/kg-fish	1.2E-04	mg/kg-day	NA	NA	NA	8.6E-04	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.1E-03	mg/kg-day	NA	NA	NA	7.9E-03	mg/kg-day	2.0E-02	mg/kg-day	0.4
				Silver	7.4E-02	mg/kg-fish	1.7E-05	mg/kg-day	NA	NA	NA	1.2E-04	mg/kg-day	5.0E-03	mg/kg-day	0.02
				Zinc	1.7E+01	mg/kg-fish	4.0E-03	mg/kg-day	NA	NA	NA	2.8E-02	mg/kg-day	3.0E-01	mg/kg-day	0.09
				4,4'-DDD	8.9E-03	mg/kg-fish	2.1E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	5.1E-07	1.5E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	1.9E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	6.5E-05	1.3E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	1.0E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.6E-08	7.3E-07	mg/kg-day	5.0E-04	mg/kg-day	0.001
				Tetrachloroethene	1.7E-03	mg/kg-fish	3.9E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	8.3E-10	2.8E-06	mg/kg-day	6.0E-03	mg/kg-day	4.6E-04
				Dioxin-Like PCBs	2.0E-05	mg/kg-fish	4.7E-09	mg/kg-day	1.3E+05	1/(mg/kg-day)	6.1E-04	3.3E-08	mg/kg-day	7.0E-10	mg/kg-day	47
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	1.6E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	3.1E-04	1.1E-03	mg/kg-day	2.0E-05	mg/kg-day	55
			Exp. Route Total								9.9E-04					103
		Exposure Point Total									9.9E-04					103
	Exposure Medium Total										9.9E-04					103
Sediment Total											9.9E-04					103
Receptor Total											9.9E-04					103

NA = Not applicable.

Table 7.12.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Fish	Ingestion	Cadmium	2.6E-01	mg/kg-fish	4.8E-05	mg/kg-day	NA	NA	NA	5.5E-04	mg/kg-day	1.0E-03	mg/kg-day	0.6
				Chromium	4.0E-01	mg/kg-fish	7.4E-05	mg/kg-day	NA	NA	NA	8.6E-04	mg/kg-day	1.5E+00	mg/kg-day	5.7E-04
				Copper	7.1E+00	mg/kg-fish	1.3E-03	mg/kg-day	NA	NA	NA	1.5E-02	mg/kg-day	4.0E-02	mg/kg-day	0.4
				Lead	5.2E-01	mg/kg-fish	9.6E-05	mg/kg-day	NA	NA	NA	1.1E-03	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	8.9E-04	mg/kg-day	NA	NA	NA	1.0E-02	mg/kg-day	2.0E-02	mg/kg-day	0.5
				Silver	7.4E-02	mg/kg-fish	1.4E-05	mg/kg-day	NA	NA	NA	1.6E-04	mg/kg-day	5.0E-03	mg/kg-day	0.03
				Zinc	1.7E+01	mg/kg-fish	3.1E-03	mg/kg-day	NA	NA	NA	3.7E-02	mg/kg-day	3.0E-01	mg/kg-day	0.1
				4,4'-DDD	8.9E-03	mg/kg-fish	1.7E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	4.0E-07	1.9E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	1.5E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	5.1E-05	1.7E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	8.2E-08	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.8E-08	9.6E-07	mg/kg-day	5.0E-04	mg/kg-day	0.002
				Tetrachloroethene	1.7E-03	mg/kg-fish	3.1E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	6.5E-10	3.6E-06	mg/kg-day	6.0E-03	mg/kg-day	6.0E-04
				Dioxin-Like PCBs	2.0E-05	mg/kg-fish	3.6E-09	mg/kg-day	1.3E+05	1/(mg/kg-day)	4.7E-04	4.3E-08	mg/kg-day	7.0E-10	mg/kg-day	61
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	1.2E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	2.5E-04	1.4E-03	mg/kg-day	2.0E-05	mg/kg-day	72
			Exp. Route Total								7.7E-04					134
		Exposure Point Total									7.7E-04					134
	Exposure Medium Total										7.7E-04					134
Sediment Total											7.7E-04					134
Receptor Total											7.7E-04					134

NA = Not applicable.

Table 7.13.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Crab	Ingestion	Cadmium	2.6E-01	mg/kg-fish	8.1E-05	mg/kg-day	NA	NA	NA	2.4E-04	mg/kg-day	1.0E-03	mg/kg-day	0.2
				Chromium	4.0E-01	mg/kg-fish	1.3E-04	mg/kg-day	NA	NA	NA	3.7E-04	mg/kg-day	1.5E+00	mg/kg-day	2.5E-04
				Copper	7.1E+00	mg/kg-fish	2.3E-03	mg/kg-day	NA	NA	NA	6.6E-03	mg/kg-day	4.0E-02	mg/kg-day	0.2
				Lead	3.2E+00	mg/kg-fish	1.0E-03	mg/kg-day	NA	NA	NA	3.0E-03	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.5E-03	mg/kg-day	NA	NA	NA	4.4E-03	mg/kg-day	2.0E-02	mg/kg-day	0.2
				Silver	7.4E-02	mg/kg-fish	2.3E-05	mg/kg-day	NA	NA	NA	6.8E-05	mg/kg-day	5.0E-03	mg/kg-day	0.01
				Zinc	2.7E+01	mg/kg-fish	8.4E-03	mg/kg-day	NA	NA	NA	2.5E-02	mg/kg-day	3.0E-01	mg/kg-day	0.1
				4,4'-DDD	8.0E-02	mg/kg-fish	2.5E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	6.1E-06	7.4E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	4.3E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.5E-04	1.3E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	1.0E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.4E-07	2.9E-06	mg/kg-day	5.0E-04	mg/kg-day	0.006
				Tetrachloroethene	1.3E-03	mg/kg-fish	4.0E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	8.4E-10	1.2E-06	mg/kg-day	6.0E-03	mg/kg-day	2.0E-04
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	6.4E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	8.3E-05	1.9E-09	mg/kg-day	7.0E-10	mg/kg-day	2.7
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	2.0E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	4.0E-05	5.8E-05	mg/kg-day	2.0E-05	mg/kg-day	2.9
			Exp. Route Total								2.8E-04					6
		Exposure Point Total									2.8E-04					6
	Exposure Medium Total										2.8E-04					6
Sediment Total											2.8E-04					6
Receptor Total											2.8E-04					6

NA = Not applicable.

Table 7.14.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Crab	Ingestion	Cadmium	2.6E-01	mg/kg-fish	6.1E-05	mg/kg-day	NA	NA	NA	4.2E-04	mg/kg-day	1.0E-03	mg/kg-day	0.4
				Chromium	4.0E-01	mg/kg-fish	9.4E-05	mg/kg-day	NA	NA	NA	6.6E-04	mg/kg-day	1.5E+00	mg/kg-day	4.4E-04
				Copper	7.1E+00	mg/kg-fish	1.7E-03	mg/kg-day	NA	NA	NA	1.2E-02	mg/kg-day	4.0E-02	mg/kg-day	0.3
				Lead	3.2E+00	mg/kg-fish	7.6E-04	mg/kg-day	NA	NA	NA	5.4E-03	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.1E-03	mg/kg-day	NA	NA	NA	7.9E-03	mg/kg-day	2.0E-02	mg/kg-day	0.4
				Silver	7.4E-02	mg/kg-fish	1.7E-05	mg/kg-day	NA	NA	NA	1.2E-04	mg/kg-day	5.0E-03	mg/kg-day	0.02
				Zinc	2.7E+01	mg/kg-fish	6.3E-03	mg/kg-day	NA	NA	NA	4.4E-02	mg/kg-day	3.0E-01	mg/kg-day	0.1
				4,4'-DDD	8.0E-02	mg/kg-fish	1.9E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	4.6E-06	1.3E-04	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	3.2E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.1E-04	2.3E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	7.5E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.6E-07	5.3E-06	mg/kg-day	5.0E-04	mg/kg-day	0.01
				Tetrachloroethene	1.3E-03	mg/kg-fish	3.0E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	6.3E-10	2.1E-06	mg/kg-day	6.0E-03	mg/kg-day	3.5E-04
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	4.8E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	6.2E-05	3.4E-09	mg/kg-day	7.0E-10	mg/kg-day	4.8
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	1.5E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	3.0E-05	1.0E-04	mg/kg-day	2.0E-05	mg/kg-day	5.2
			Exp. Route Total								2.1E-04					11
		Exposure Point Total									2.1E-04					11
	Exposure Medium Total										2.1E-04					11
Sediment Total											2.1E-04					11
Receptor Total											2.1E-04					11

NA = Not applicable.

Table 7.15.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Crab	Ingestion	Cadmium	2.6E-01	mg/kg-fish	4.8E-05	mg/kg-day	NA	NA	NA	5.5E-04	mg/kg-day	1.0E-03	mg/kg-day	0.6
				Chromium	4.0E-01	mg/kg-fish	7.4E-05	mg/kg-day	NA	NA	NA	8.6E-04	mg/kg-day	1.5E+00	mg/kg-day	5.7E-04
				Copper	7.1E+00	mg/kg-fish	1.3E-03	mg/kg-day	NA	NA	NA	1.5E-02	mg/kg-day	4.0E-02	mg/kg-day	0.4
				Lead	3.2E+00	mg/kg-fish	6.0E-04	mg/kg-day	NA	NA	NA	7.0E-03	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	8.9E-04	mg/kg-day	NA	NA	NA	1.0E-02	mg/kg-day	2.0E-02	mg/kg-day	0.5
				Silver	7.4E-02	mg/kg-fish	1.4E-05	mg/kg-day	NA	NA	NA	1.6E-04	mg/kg-day	5.0E-03	mg/kg-day	0.03
				Zinc	2.7E+01	mg/kg-fish	4.9E-03	mg/kg-day	NA	NA	NA	5.8E-02	mg/kg-day	3.0E-01	mg/kg-day	0.2
				4,4'-DDD	8.0E-02	mg/kg-fish	1.5E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	3.6E-06	1.7E-04	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	2.5E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	8.6E-05	2.9E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	5.9E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.0E-07	6.9E-06	mg/kg-day	5.0E-04	mg/kg-day	0.01
				Tetrachloroethene	1.3E-03	mg/kg-fish	2.4E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	4.9E-10	2.7E-06	mg/kg-day	6.0E-03	mg/kg-day	4.6E-04
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	3.8E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	4.9E-05	4.4E-09	mg/kg-day	7.0E-10	mg/kg-day	6.3
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	1.2E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	2.3E-05	1.4E-04	mg/kg-day	2.0E-05	mg/kg-day	6.8
			Exp. Route Total								1.6E-04					15
		Exposure Point Total									1.6E-04					15
	Exposure Medium Total										1.6E-04					15
Sediment Total											1.6E-04					15
Receptor Total											1.6E-04					15

NA = Not applicable.

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Aluminum	NA	NA	NA	NA	Nervous system	0.007	NA	NA	0.007
			Arsenic	4E-07	NA	1E-07	5E-07	Skin, Cardiovascular	0.002	NA	8.4E-04	0.003
			Cobalt	NA	NA	NA	NA	Thyroid	0.02	NA	NA	0.02
			Iron	NA	NA	NA	NA	GI System	0.02	NA	NA	0.02
			Manganese	NA	NA	NA	NA	Nervous system	0.02	NA	NA	0.02
			Vanadium	NA	NA	NA	NA	Hair	0.009	NA	NA	0.009
			Aroclor-1254	3E-08	NA	5E-08	9E-08	Finger nails, Eyes	0.002	NA	0.004	0.006
			Benzo(a)pyrene	1E-07	NA	2E-07	3E-07	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	2E-08	NA	3E-08	5E-08	NA	NA	NA	NA	NA
			Chromium (hexavalent)	2E-07	NA	NA	2E-07	NOE	3.2E-04	NA	NA	3.2E-04
		Exposure Point Total		7E-07	NA	4E-07	1E-06		0.08	NA	0.005	0.08
	Exposure Medium Total			7E-07	NA	4E-07	1E-06		0.08	NA	0.005	0.08
	Ambient Air	North Area Emissions from Surface Soil	Aluminum	NA	NA	NA	NA	Nervous system	NA	1.6E-04	NA	1.6E-04
			Arsenic	NA	1E-10	NA	1E-10	Cardiovascular, Nervous system, Development	NA	6.0E-06	NA	6.0E-06
			Cobalt	NA	3E-09	NA	3E-09	Respiratory	NA	1.4E-04	NA	1.4E-04
			Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	NA	9.6E-04	NA	9.6E-04
			Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Aroclor-1254	NA	1E-12	NA	1E-12	NA	NA	NA	NA	NA
			Benzo(a)pyrene	NA	2E-12	NA	2E-12	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	NA	4E-13	NA	4E-13	NA	NA	NA	NA	NA
			Chromium (hexavalent)	NA	3E-09	NA	3E-09	Respiratory	NA	1.2E-06	NA	1.2E-06
		Exposure Point Total		NA	6E-09	NA	6E-09		NA	0.001	NA	0.001
	Exposure Medium Total			NA	6E-09	NA	6E-09		NA	0.001	NA	0.001
Medium Total				7E-07	6E-09	4E-07	1E-06		0.08	0.001	0.005	0.08

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	Antimony	NA	NA	NA	NA	Longevity, Blood	0.004	NA	0.008	0.01
			Cadmium	NA	NA	NA	NA	Kidney	0.005	NA	0.2	0.2
			Thallium	NA	NA	NA	NA	Hair	2	NA	4	6
			Chromium (hexavalent)	1E-06	NA	2E-04	2E-04	NOE	0.002	NA	0.3	0.3
		Exposure Point Total		1E-06	NA	2E-04	2E-04		2	NA	4	6
	Exposure Medium Total			1E-06	NA	2E-04	2E-04		2	NA	4	6
Medium Total				1E-06	NA	2E-04	2E-04		2	NA	4	6
Sediment	Sediment	Sediment	Aluminum	NA	NA	NA	NA	Nervous system	0.003	NA	NA	0.003
			Antimony	NA	NA	NA	NA	Longevity, Blood	0.002	NA	NA	0.002
			Arsenic	8E-07	NA	1E-06	2E-06	Skin, Cardiovascular	0.005	NA	0.007	0.01
			Cobalt	NA	NA	NA	NA	Thyroid	0.006	NA	NA	0.006
			Iron	NA	NA	NA	NA	GI System	0.01	NA	NA	0.01
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	0.003	NA	NA	0.003
			Thallium	NA	NA	NA	NA	Hair	0.1	NA	NA	0.1
			Vanadium	NA	NA	NA	NA	Hair	0.003	NA	NA	0.003
			Aroclor-1254	4E-08	NA	2E-07	2E-07	Finger nails, Eyes	0.003	NA	0.02	0.02
			Benzo(a)pyrene	6E-08	NA	3E-07	4E-07	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	8E-09	NA	4E-08	5E-08	NA	NA	NA	NA	NA
			Chromium (hexavalent)	4E-07	NA	NA	4E-07	NOE	8.1E-04	NA	NA	8.1E-04
		Exposure Point Total		1E-06	NA	2E-06	3E-06		0.1	NA	0.02	0.2
	Exposure Medium Total			1E-06	NA	2E-06	3E-06		0.1	NA	0.02	0.2
Medium Total				1E-06	NA	2E-06	3E-06		0.1	NA	0.02	0.2
Receptor Total				3E-06	6E-09	2E-04	2E-04		2	0.001	4	6

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

NA = Not applicable or not available
NOE = No Observed Effect
GI = Gastrointestinal

Target Organ-Specific Hazard Indices by Exposure Medium:

	Soil	Surface Water	Sediment	Across Media
Total Blood HI for Exposure Medium	NA	0.01	0.002	0.01
Total Cardiovascular HI for Exposure Medium	0.003	NA	0.01	0.02
Total Nervous System HI for Exposure Medium	0.02	NA	0.006	0.03
Total Development HI for Exposure Medium	6.0E-06	NA	NA	6.0E-06
Total GI System HI for Exposure Medium	0.02	NA	0.01	0.03
Total Hair HI for Exposure Medium	0.009	**6**	0.1	**6**
Total Kidney HI for Exposure Medium	NA	0.2	NA	0.2
Total Longevity HI for Exposure Medium	NA	0.01	0.002	0.01
Total NOE HI for Exposure Medium	3.2E-04	0.3	8.1E-04	0.3
Total Respiratory HI for Exposure Medium	1.4E-04	NA	NA	1.4E-04
Total Skin HI for Exposure Medium	0.003	NA	0.01	0.02
Total Thyroid HI for Exposure Medium	0.02	NA	0.006	0.03
Total Eyes HI for Exposure Medium	0.006	NA	0.02	0.02
Total Finger Nails HI for Exposure Medium	0.006	NA	0.02	0.02

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Aluminum	NA	NA	NA	NA	Nervous system	0.01	NA	NA	0.01
			Arsenic	3E-07	NA	7E-08	4E-07	Skin, Cardiovascular	0.004	NA	0.001	0.005
			Cobalt	NA	NA	NA	NA	Thyroid	0.04	NA	NA	0.04
			Iron	NA	NA	NA	NA	GI System	0.03	NA	NA	0.03
			Manganese	NA	NA	NA	NA	Nervous system	0.03	NA	NA	0.03
			Vanadium	NA	NA	NA	NA	Hair	0.02	NA	NA	0.02
			Aroclor-1254	3E-08	NA	3E-08	5E-08	Finger nails, Eyes	0.004	NA	0.005	0.009
			Benzo(a)pyrene	3E-07	NA	3E-07	6E-07	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	5E-08	NA	5E-08	1E-07	NA	NA	NA	NA	NA
			Chromium (hexavalent)	4E-07	NA	NA	4E-07	NOE	5.8E-04	NA	NA	5.8E-04
		Exposure Point Total		1E-06	NA	4E-07	1E-06		0.1	NA	0.006	0.1
	Exposure Medium Total			1E-06	NA	4E-07	1E-06		0.1	NA	0.006	0.1
	Ambient Air	North Area Emissions from Surface Soil	Aluminum	NA	NA	NA	NA	Nervous system	NA	1.6E-04	NA	1.6E-04
			Arsenic	NA	6E-11	NA	6E-11	Cardiovascular, Nervous system, Development	NA	6.0E-06	NA	6.0E-06
			Cobalt	NA	1E-09	NA	1E-09	Respiratory	NA	1.4E-04	NA	1.4E-04
			Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	NA	9.6E-04	NA	9.6E-04
			Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Aroclor-1254	NA	5E-13	NA	5E-13	NA	NA	NA	NA	NA
			Benzo(a)pyrene	NA	3E-12	NA	3E-12	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	NA	5E-13	NA	5E-13	NA	NA	NA	NA	NA
			Chromium (hexavalent)	NA	4E-09	NA	4E-09	Respiratory	NA	1.2E-06	NA	1.2E-06
		Exposure Point Total		NA	5E-09	NA	5E-09		NA	0.001	NA	0.001
	Exposure Medium Total			NA	5E-09	NA	5E-09		NA	0.001	NA	0.001
Medium Total				1E-06	5E-09	4E-07	1E-06		0.1	0.001	0.006	0.1

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	Antimony	NA	NA	NA	NA	Longevity, Blood	0.008	NA	0.009	0.02
			Cadmium	NA	NA	NA	NA	Kidney	0.009	NA	0.2	0.2
			Thallium	NA	NA	NA	NA	Hair	4	NA	4	8
			Chromium (hexavalent)	3E-06	NA	3E-04	3E-04	NOE	0.004	NA	0.4	0.4
		Exposure Point Total		3E-06	NA	3E-04	3E-04		4	NA	5	9
	Exposure Medium Total			3E-06	NA	3E-04	3E-04		4	NA	5	9
Medium Total				3E-06	NA	3E-04	3E-04		4	NA	5	9
Sediment	Sediment	Sediment	Aluminum	NA	NA	NA	NA	Nervous system	0.005	NA	NA	0.005
			Antimony	NA	NA	NA	NA	Longevity, Blood	0.004	NA	NA	0.004
			Arsenic	6E-07	NA	5E-07	1E-06	Skin, Cardiovascular	0.009	NA	0.008	0.02
			Cobalt	NA	NA	NA	NA	Thyroid	0.01	NA	NA	0.01
			Iron	NA	NA	NA	NA	GI System	0.02	NA	NA	0.02
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	0.005	NA	NA	0.005
			Thallium	NA	NA	NA	NA	Hair	0.2	NA	NA	0.2
			Vanadium	NA	NA	NA	NA	Hair	0.005	NA	NA	0.005
			Aroclor-1254	3E-08	NA	1E-07	1E-07	Finger nails, Eyes	0.005	NA	0.02	0.02
			Benzo(a)pyrene	1E-07	NA	5E-07	6E-07	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	2E-08	NA	7E-08	9E-08	NA	NA	NA	NA	NA
			Chromium (hexavalent)	9E-07	NA	NA	9E-07	NOE	0.001	NA	NA	0.001
		Exposure Point Total		2E-06	NA	1E-06	3E-06		0.3	NA	0.03	0.3
	Exposure Medium Total			2E-06	NA	1E-06	3E-06		0.3	NA	0.03	0.3
Medium Total				2E-06	NA	1E-06	3E-06		0.3	NA	0.03	0.3
Receptor Total				5E-06	5E-09	3E-04	3E-04		4	0.001	5	9

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

NA = Not applicable or not available
NOE = No Observed Effect
GI = Gastrointestinal

Target Organ-Specific Hazard Indices by Exposure Medium:

	Soil	Surface Water	Sediment	Across Media
Total Blood HI for Exposure Medium	NA	0.02	0.004	0.02
Total Cardiovascular HI for Exposure Medium	0.005	NA	0.02	0.02
Total Nervous System HI for Exposure Medium	0.04	NA	0.01	0.05
Total Development HI for Exposure Medium	6.0E-06	NA	NA	6.0E-06
Total GI System HI for Exposure Medium	0.03	NA	0.02	0.06
Total Hair HI for Exposure Medium	0.02	**8**	0.2	**8**
Total Kidney HI for Exposure Medium	NA	0.2	NA	0.2
Total Longevity HI for Exposure Medium	NA	0.02	0.004	0.02
Total NOE HI for Exposure Medium	5.8E-04	0.4	0.001	0.4
Total Respiratory HI for Exposure Medium	1.4E-04	NA	NA	1.4E-04
Total Skin HI for Exposure Medium	0.005	NA	0.02	0.02
Total Thyroid HI for Exposure Medium	0.04	NA	0.01	0.05
Total Eyes HI for Exposure Medium	0.009	NA	0.02	0.03
Total Finger Nails HI for Exposure Medium	0.009	NA	0.02	0.03

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Aluminum	NA	NA	NA	NA	Nervous system	0.06	NA	NA	0.06
			Arsenic	9E-07	NA	7E-08	1E-06	Skin, Cardiovascular	0.02	NA	0.002	0.02
			Cobalt	NA	NA	NA	NA	Thyroid	0.2	NA	NA	0.2
			Iron	NA	NA	NA	NA	GI System	0.2	NA	NA	0.2
			Manganese	NA	NA	NA	NA	Nervous system	0.2	NA	NA	0.2
			Vanadium	NA	NA	NA	NA	Hair	0.08	NA	NA	0.08
			Aroclor-1254	8E-08	NA	3E-08	1E-07	Finger nails, Eyes	0.02	NA	0.009	0.03
			Benzo(a)pyrene	2E-06	NA	7E-07	3E-06	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	3E-07	NA	1E-07	5E-07	NA	NA	NA	NA	NA
			Chromium (hexavalent)	3E-06	NA	NA	3E-06	NOE	0.003	NA	NA	0.003
		Exposure Point Total		6E-06	NA	9E-07	7E-06		0.7	NA	0.01	0.7
	Exposure Medium Total			6E-06	NA	9E-07	7E-06		0.7	NA	0.01	0.7
	Ambient Air	North Area Emissions from Surface Soil	Aluminum	NA	NA	NA	NA	Nervous system	NA	1.6E-04	NA	1.6E-04
			Arsenic	NA	3E-11	NA	3E-11	Cardiovascular, Nervous system, Development	NA	6.0E-06	NA	6.0E-06
			Cobalt	NA	6E-10	NA	6E-10	Respiratory	NA	1.4E-04	NA	1.4E-04
			Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	NA	9.6E-04	NA	9.6E-04
			Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Aroclor-1254	NA	3E-13	NA	3E-13	NA	NA	NA	NA	NA
			Benzo(a)pyrene	NA	3E-12	NA	3E-12	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	NA	5E-13	NA	5E-13	NA	NA	NA	NA	NA
			Chromium (hexavalent)	NA	5E-09	NA	5E-09	Respiratory	NA	1.2E-06	NA	1.2E-06
		Exposure Point Total		NA	5E-09	NA	5E-09		NA	0.001	NA	0.001
	Exposure Medium Total			NA	5E-09	NA	5E-09		NA	0.001	NA	0.001
Medium Total				6E-06	5E-09	9E-07	7E-06		0.7	0.001	0.01	0.7

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	Antimony	NA	NA	NA	NA	Longevity, Blood	0.02	NA	0.01	0.03
			Cadmium	NA	NA	NA	NA	Kidney	0.02	NA	0.3	0.3
			Thallium	NA	NA	NA	NA	Hair	9	NA	6	15
			Chromium (hexavalent)	9E-06	NA	4E-04	5E-04	NOE	0.01	NA	0.6	0.6
		Exposure Point Total		9E-06	NA	4E-04	5E-04		9	NA	7	16
	Exposure Medium Total			9E-06	NA	4E-04	5E-04		9	NA	7	16
Medium Total				9E-06	NA	4E-04	5E-04		9	NA	7	16
Sediment	Sediment	Sediment	Aluminum	NA	NA	NA	NA	Nervous system	0.01	NA	NA	0.01
			Antimony	NA	NA	NA	NA	Longevity, Blood	0.009	NA	NA	0.009
			Arsenic	1E-06	NA	6E-07	2E-06	Skin, Cardiovascular	0.02	NA	0.01	0.04
			Cobalt	NA	NA	NA	NA	Thyroid	0.03	NA	NA	0.03
			Iron	NA	NA	NA	NA	GI System	0.06	NA	NA	0.06
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	0.01	NA	NA	0.01
			Thallium	NA	NA	NA	NA	Hair	0.5	NA	NA	0.5
			Vanadium	NA	NA	NA	NA	Hair	0.01	NA	NA	0.01
			Aroclor-1254	4E-08	NA	1E-07	2E-07	Finger nails, Eyes	0.01	NA	0.03	0.05
			Benzo(a)pyrene	4E-07	NA	1E-06	2E-06	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	6E-08	NA	2E-07	2E-07	NA	NA	NA	NA	NA
			Chromium (hexavalent)	3E-06	NA	NA	3E-06	NOE	0.004	NA	NA	0.004
		Exposure Point Total		5E-06	NA	2E-06	7E-06		0.7	NA	0.05	0.7
	Exposure Medium Total			5E-06	NA	2E-06	7E-06		0.7	NA	0.05	0.7
Medium Total				5E-06	NA	2E-06	7E-06		0.7	NA	0.05	0.7
Receptor Total				2E-05	5E-09	5E-04	5E-04		11	0.001	7	18

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational User/Trespasser/Site Visitor
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

NA = Not applicable or not available
NOE = No Observed Effect
GI = Gastrointestinal

Target Organ-Specific Hazard Indices by Exposure Medium:

	Soil	Surface Water	Sediment	Across Media
Total Blood HI for Exposure Medium	NA	0.03	0.009	0.04
Total Cardiovascular HI for Exposure Medium	0.02	NA	0.04	0.06
Total Nervous System HI for Exposure Medium	0.2	NA	0.03	0.2
Total Development HI for Exposure Medium	6.0E-06	NA	NA	6.0E-06
Total GI System HI for Exposure Medium	0.2	NA	0.06	0.2
Total Hair HI for Exposure Medium	0.08	**15**	0.5	**16**
Total Kidney HI for Exposure Medium	NA	0.3	NA	0.3
Total Longevity HI for Exposure Medium	NA	0.03	0.009	0.04
Total NOE HI for Exposure Medium	0.003	0.6	0.004	0.6
Total Respiratory HI for Exposure Medium	1.4E-04	NA	NA	1.4E-04
Total Skin HI for Exposure Medium	0.02	NA	0.04	0.06
Total Thyroid HI for Exposure Medium	0.2	NA	0.03	0.2
Total Eyes HI for Exposure Medium	0.03	NA	0.05	0.08
Total Finger Nails HI for Exposure Medium	0.03	NA	0.05	0.08

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Aluminum	NA	NA	NA	NA	Nervous system	0.02	NA	NA	0.02
			Arsenic	NA	NA	NA	NA	Skin, Cardiovascular	0.008	NA	9.8E-04	0.009
			Cobalt	NA	NA	NA	NA	Thyroid	0.08	NA	NA	0.08
			Iron	NA	NA	NA	NA	GI System	0.06	NA	NA	0.06
			Manganese	NA	NA	NA	NA	Nervous system	0.05	NA	NA	0.05
			Vanadium	NA	NA	NA	NA	Hair	0.03	NA	NA	0.03
			Aroclor-1254	NA	NA	NA	NA	Finger nails, Eyes	0.008	NA	0.005	0.01
			Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chromium (hexavalent)	NA	NA	NA	NA	NOE	0.001	NA	NA	0.001
		Exposure Point Total		NA	NA	NA	NA		0.3	NA	0.006	0.3
	Exposure Medium Total			NA	NA	NA	NA		0.3	NA	0.006	0.3
	Ambient Air	North Area Emissions from Surface Soil	Aluminum	NA	NA	NA	NA	Nervous system	NA	0.003	NA	0.003
			Arsenic	NA	NA	NA	NA	Cardiovascular, Nervous system, Development	NA	1.2E-04	NA	1.2E-04
			Cobalt	NA	NA	NA	NA	Respiratory	NA	0.003	NA	0.003
			Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	NA	0.02	NA	0.02
			Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chromium (hexavalent)	NA	NA	NA	NA	Respiratory	NA	2.4E-05	NA	2.4E-05
		Exposure Point Total		NA	NA	NA	NA		NA	0.03	NA	0.03
	Exposure Medium Total			NA	NA	NA	NA		NA	0.03	NA	0.03
Medium Total				NA	NA	NA	NA		0.3	0.03	0.006	0.3
Receptor Total				NA	NA	NA	NA		0.3	0.03	0.006	0.3

NA = Not applicable or not available
NOE = No Observed Effect
GI = Gastrointestinal

Total Cardiovascular HI Across Media	0.009
Total Nervous System HI Across Media	0.10
Total Development HI Across Media	1.2E-04
Total GI System HI Across Media	0.06
Total Hair HI Across Media	0.03
Total NOE HI Across Media	0.001
Total Respiratory HI Across Media	0.003
Total Skin HI Across Media	0.009
Total Thyroid HI Across Media	0.08
Total Eyes HI Across Media	0.01
Total Finger Nails HI Across Media	0.01

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Aluminum	NA	NA	NA	NA	Nervous system	0.2	NA	NA	0.2
			Arsenic	NA	NA	NA	NA	Skin, Cardiovascular	0.08	NA	0.006	0.08
			Cobalt	NA	NA	NA	NA	Thyroid	0.7	NA	NA	0.7
			Iron	NA	NA	NA	NA	GI System	0.6	NA	NA	0.6
			Manganese	NA	NA	NA	NA	Nervous system	0.5	NA	NA	0.5
			Vanadium	NA	NA	NA	NA	Hair	0.3	NA	NA	0.3
			Aroclor-1254	NA	NA	NA	NA	Finger nails, Eyes	0.08	NA	0.03	0.1
			Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chromium (hexavalent)	NA	NA	NA	NA	NOE	0.01	NA	NA	0.01
		Exposure Point Total		NA	NA	NA	NA		2	NA	0.04	2
	Exposure Medium Total			NA	NA	NA	NA		2	NA	0.04	2
	Ambient Air	North Area Emissions from Surface Soil	Aluminum	NA	NA	NA	NA	Nervous system	NA	0.003	NA	0.003
			Arsenic	NA	NA	NA	NA	Cardiovascular, Nervous system, Development	NA	1.2E-04	NA	1.2E-04
			Cobalt	NA	NA	NA	NA	Respiratory	NA	0.003	NA	0.003
			Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	NA	0.02	NA	0.02
			Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chromium (hexavalent)	NA	NA	NA	NA	Respiratory	NA	2.4E-05	NA	2.4E-05
		Exposure Point Total		NA	NA	NA	NA		NA	0.03	NA	0.03
	Exposure Medium Total			NA	NA	NA	NA		NA	0.03	NA	0.03
Medium Total				NA	NA	NA	NA		2	0.03	0.04	3
Receptor Total				NA	NA	NA	NA		2	0.03	0.04	3

NA = Not applicable or not available
NOE = No Observed Effect
GI = Gastrointestinal

Total Cardiovascular HI Across Media	0.08
Total Nervous System HI Across Media	0.7
Total Development HI Across Media	1.2E-04
Total GI System HI Across Media	0.6
Total Hair HI Across Media	0.3
Total NOE HI Across Media	0.01
Total Respiratory HI Across Media	0.003
Total Skin HI Across Media	0.08
Total Thyroid HI Across Media	0.7
Total Eyes HI Across Media	0.1
Total Finger Nails HI Across Media	0.1

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Aluminum	NA	NA	NA	NA	Nervous system	NA	NA	NA	NA
			Arsenic	4E-06	NA	4E-07	5E-06	Skin, Cardiovascular	NA	NA	NA	NA
			Cobalt	NA	NA	NA	NA	Thyroid	NA	NA	NA	NA
			Iron	NA	NA	NA	NA	GI System	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	NA	NA	NA	NA
			Vanadium	NA	NA	NA	NA	Hair	NA	NA	NA	NA
			Aroclor-1254	4E-07	NA	2E-07	5E-07	Finger nails, Eyes	NA	NA	NA	NA
			Benzo(a)pyrene	8E-06	NA	3E-06	1E-05	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	1E-06	NA	6E-07	2E-06	NA	NA	NA	NA	NA
			Chromium (hexavalent)	1E-05	NA	NA	1E-05	NOE	NA	NA	NA	NA
		Exposure Point Total		2E-05	NA	4E-06	3E-05		NA	NA	NA	NA
	Exposure Medium Total			2E-05	NA	4E-06	3E-05		NA	NA	NA	NA
	Ambient Air	North Area Emissions from Surface Soil	Aluminum	NA	NA	NA	NA	Nervous system	NA	NA	NA	NA
			Arsenic	NA	3E-09	NA	3E-09	Cardiovascular, Nervous system, Development	NA	NA	NA	NA
			Cobalt	NA	6E-08	NA	6E-08	Respiratory	NA	NA	NA	NA
			Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	Nervous system	NA	NA	NA	NA
			Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Aroclor-1254	NA	3E-11	NA	3E-11	NA	NA	NA	NA	NA
			Benzo(a)pyrene	NA	1E-10	NA	1E-10	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	NA	3E-11	NA	3E-11	NA	NA	NA	NA	NA
			Chromium (hexavalent)	NA	2E-07	NA	2E-07	Respiratory	NA	NA	NA	NA
		Exposure Point Total		NA	3E-07	NA	3E-07		NA	NA	NA	NA
	Exposure Medium Total			NA	3E-07	NA	3E-07		NA	NA	NA	NA
Medium Total				2E-05	3E-07	4E-06	3E-05		NA	NA	NA	NA
Receptor Total				2E-05	3E-07	4E-06	3E-05		NA	NA	NA	NA

NA = Not applicable or not available
NOE = No Observed Effect
GI = Gastrointestinal

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Arsenic	2E-07	NA	4E-08	2E-07	Skin, Cardiovascular	0.001	NA	2.4E-04	0.001
		Exposure Point Total		2E-07	NA	4E-08	2E-07		0.001	NA	2.4E-04	0.001
	Exposure Medium Total			2E-07	NA	4E-08	2E-07		0.001	NA	2.4E-04	0.001
	Ambient Air	North Area Emissions from Surface Soil	Arsenic	NA	1E-10	NA	1E-10	Cardiovascular, Nervous system, Development	NA	6.0E-06	NA	6.0E-06
		Exposure Point Total		NA	1E-10	NA	1E-10		NA	6.0E-06	NA	6.0E-06
	Exposure Medium Total			NA	1E-10	NA	1E-10		NA	6.0E-06	NA	6.0E-06
Medium Total				2E-07	1E-10	4E-08	2E-07		0.001	6.0E-06	2.4E-04	0.001
Receptor Total				2E-07	1E-10	4E-08	2E-07		0.001	6.0E-06	2.4E-04	0.001

NA = Not applicable or not available

Total Cardiovascular HI Across Media	0.001
Total Nervous System HI Across Media	6.0E-06
Total Development HI Across Media	6.0E-06
Total Skin HI Across Media	0.001

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Arsenic	1E-07	NA	1E-08	1E-07	Skin	0.02	NA	0.002	0.02
		Exposure Point Total		1E-07	NA	1E-08	1E-07		0.02	NA	0.002	0.02
	Exposure Medium Total			1E-07	NA	1E-08	1E-07		0.02	NA	0.002	0.02
	Ambient Air	North Area Emissions from Surface Soil	Arsenic	NA	2E-09	NA	2E-09	Cardiovascular, Nervous system, Development	NA	0.002	NA	0.002
		Exposure Point Total		NA	2E-09	NA	2E-09		NA	0.002	NA	0.002
	Exposure Medium Total			NA	2E-09	NA	2E-09		NA	0.002	NA	0.002
Medium Total				1E-07	2E-09	1E-08	1E-07		0.02	0.002	0.002	0.02
Receptor Total				1E-07	2E-09	1E-08	1E-07		0.02	0.002	0.002	0.02

NA = Not applicable or not available

Total Cardiovascular HI Across Media	0.002
Total Nervous System HI Across Media	0.002
Total Development HI Across Media	0.002
Total Skin HI Across Media	0.02

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (0 - 6 inches)	North Area Surface Soil (0 - 6 inches)	Arsenic	9E-07	NA	2E-07	1E-06	Skin, Cardiovascular	0.006	NA	0.001	0.007
		Exposure Point Total		9E-07	NA	2E-07	1E-06		0.006	NA	0.001	0.007
	Exposure Medium Total			9E-07	NA	2E-07	1E-06		0.006	NA	0.001	0.007
	Ambient Air	North Area Emissions from Surface Soil	Arsenic	NA	7E-10	NA	7E-10	Cardiovascular, Nervous system, Development	NA	2.9E-05	NA	2.9E-05
		Exposure Point Total		NA	7E-10	NA	7E-10		NA	2.9E-05	NA	2.9E-05
	Exposure Medium Total			NA	7E-10	NA	7E-10		NA	2.9E-05	NA	2.9E-05
Medium Total				9E-07	7E-10	2E-07	1E-06		0.006	2.9E-05	0.001	0.007
Receptor Total				9E-07	7E-10	2E-07	1E-06		0.006	2.9E-05	0.001	0.007

NA = Not applicable or not available

Total Cardiovascular HI Across Media	0.007
Total Nervous System HI Across Media	2.9E-05
Total Development HI Across Media	2.9E-05
Total Skin HI Across Media	0.007

Table 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Fish	Cadmium	NA	NA	NA	NA	Kidney	0.2	NA	NA	0.2
			Chromium	NA	NA	NA	NA	NOE	2.5E-04	NA	NA	2.5E-04
			Copper	NA	NA	NA	NA	GI system	0.2	NA	NA	0.2
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.2	NA	NA	0.2
			Silver	NA	NA	NA	NA	Skin	0.01	NA	NA	0.01
			Zinc	NA	NA	NA	NA	Blood	0.1	NA	NA	0.1
			4,4'-DDD	7E-07	NA	NA	7E-07	NA	NA	NA	NA	NA
			4,4'-DDE	9E-05	NA	NA	9E-05	NA	NA	NA	NA	NA
			4,4'-DDT	5E-08	NA	NA	5E-08	Liver	8.2E-04	NA	NA	8.2E-04
			Tetrachloroethene	1E-09	NA	NA	1E-09	Liver	2.6E-04	NA	NA	2.6E-04
			Dioxin-Like PCBs	8E-04	NA	NA	8E-04	Reproduction	2.6E+01	NA	NA	26
			Non Dioxin-Like PCBs	4E-04	NA	NA	4E-04	Finger nails, Eyes	3.1E+01	NA	NA	31
		Exposure Point Total		1E-03	NA	NA	1E-03		57	NA	NA	57
	Exposure Medium Total			1E-03	NA	NA	1E-03		57	NA	NA	57
Sediment Total				1E-03	NA	NA	1E-03		57	NA	NA	57
Receptor Total				1E-03	NA	NA	1E-03		57	NA	NA	57

GI = Gastrointestinal
NA - Not applicable/not available
NOE = No Observed Effect

Total Blood HI Across Media =	0.1
Total Reproduction HI Across Media =	**26**
Total GI System HI Across Media =	0.2
Total Kidney HI Across Media =	0.2
Total Liver HI Across Media =	1.1E-03
Total Body Weight HI Across Media =	0.2
Total Skin HI Across Media =	0.01
Total NOE HI Across Media =	2.5E-04
Total Kidney HI Across Media =	0.2
Total Eyes HI Across Media =	**31**
Total Finger Nails HI Across Media =	**31**

Table 9.11.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Fish	Cadmium	NA	NA	NA	NA	Kidney	0.4	NA	NA	0.4
			Chromium	NA	NA	NA	NA	NOE	4.4E-04	NA	NA	4.4E-04
			Copper	NA	NA	NA	NA	GI system	0.3	NA	NA	0.3
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.4	NA	NA	0.4
			Silver	NA	NA	NA	NA	Skin	0.02	NA	NA	0.02
			Zinc	NA	NA	NA	NA	Blood	0.09	NA	NA	0.09
			4,4'-DDD	5E-07	NA	NA	5E-07	NA	NA	NA	NA	NA
			4,4'-DDE	7E-05	NA	NA	7E-05	NA	NA	NA	NA	NA
			4,4'-DDT	4E-08	NA	NA	4E-08	Liver	0.001	NA	NA	0.001
			Tetrachloroethene	8E-10	NA	NA	8E-10	Liver	4.6E-04	NA	NA	4.6E-04
			Dioxin-Like PCBs	6E-04	NA	NA	6E-04	Reproduction	4.7E+01	NA	NA	47
			Non Dioxin-Like PCBs	3E-04	NA	NA	3E-04	Finger nails, Eyes	5.5E+01	NA	NA	55
		Exposure Point Total		1E-03	NA	NA	1E-03		103	NA	NA	103
	Exposure Medium Total			1E-03	NA	NA	1E-03		103	NA	NA	103
Sediment Total				1E-03	NA	NA	1E-03		103	NA	NA	103
Receptor Total				1E-03	NA	NA	1E-03		103	NA	NA	103

Total Blood HI Across Media =	0.09
Total Reproduction HI Across Media =	**47**
Total GI System HI Across Media =	0.3
Total Kidney HI Across Media =	0.4
Total Liver HI Across Media =	0.002
Total Body Weight HI Across Media =	0.4
Total Skin HI Across Media =	0.02
Total NOE HI Across Media =	4.4E-04
Total Kidney HI Across Media =	0.4
Total Eyes HI Across Media =	**55**
Total Finger Nails HI Across Media =	**55**

GI = Gastrointestinal
NA - Not applicable/not available
NOE = No Observed Effect

Table 9.12.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Fish	Cadmium	NA	NA	NA	NA	Kidney	0.6	NA	NA	0.6
			Chromium	NA	NA	NA	NA	NOE	5.7E-04	NA	NA	5.7E-04
			Copper	NA	NA	NA	NA	GI system	0.4	NA	NA	0.4
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.5	NA	NA	0.5
			Silver	NA	NA	NA	NA	Skin	0.03	NA	NA	0.03
			Zinc	NA	NA	NA	NA	Blood	0.1	NA	NA	0.1
			4,4'-DDD	4E-07	NA	NA	4E-07	NA	NA	NA	NA	NA
			4,4'-DDE	5E-05	NA	NA	5E-05	NA	NA	NA	NA	NA
			4,4'-DDT	3E-08	NA	NA	3E-08	Liver	0.002	NA	NA	0.002
			Tetrachloroethene	6E-10	NA	NA	6E-10	Liver	6.0E-04	NA	NA	6.0E-04
			Dioxin-Like PCBs	5E-04	NA	NA	5E-04	Reproduction	6.1E+01	NA	NA	61
			Non Dioxin-Like PCBs	2E-04	NA	NA	2E-04	Finger nails, Eyes	7.2E+01	NA	NA	72
		Exposure Point Total		8E-04	NA	NA	8E-04		134	NA	NA	134
	Exposure Medium Total			8E-04	NA	NA	8E-04		134	NA	NA	134
Sediment Total				8E-04	NA	NA	8E-04		134	NA	NA	134
Receptor Total				8E-04	NA	NA	8E-04		134	NA	NA	134

Total Blood HI Across Media =	0.1
Total Reproduction HI Across Media =	**61**
Total GI System HI Across Media =	0.4
Total Kidney HI Across Media =	0.6
Total Liver HI Across Media =	0.003
Total Body Weight HI Across Media =	0.5
Total Skin HI Across Media =	0.03
Total NOE HI Across Media =	5.7E-04
Total Kidney HI Across Media =	0.6
Total Eyes HI Across Media =	**72**
Total Finger Nails HI Across Media =	**72**

GI = Gastrointestinal
NA - Not applicable/not available
NOE = No Observed Effect

Table 9.13.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Crab	Cadmium	NA	NA	NA	NA	Kidney	0.2	NA	NA	0.2
			Chromium	NA	NA	NA	NA	NOE	2.5E-04	NA	NA	2.5E-04
			Copper	NA	NA	NA	NA	GI system	0.2	NA	NA	0.2
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.2	NA	NA	0.2
			Silver	NA	NA	NA	NA	Skin	0.01	NA	NA	0.01
			Zinc	NA	NA	NA	NA	Blood	0.1	NA	NA	0.1
			4,4'-DDD	6E-06	NA	NA	6E-06	NA	NA	NA	NA	NA
			4,4'-DDE	1E-04	NA	NA	1E-04	NA	NA	NA	NA	NA
			4,4'-DDT	3E-07	NA	NA	3E-07	Liver	0.006	NA	NA	0.006
			Tetrachloroethene	8E-10	NA	NA	8E-10	Nervous System	2.0E-04	NA	NA	2.0E-04
			Dioxin-Like PCBs	8E-05	NA	NA	8E-05	Reproduction	2.7E+00	NA	NA	3
			Non Dioxin-Like PCBs	4E-05	NA	NA	4E-05	Finger nails, Eyes	2.9E+00	NA	NA	3
		Exposure Point Total		3E-04	NA	NA	3E-04		6	NA	NA	6
	Exposure Medium Total			3E-04	NA	NA	3E-04		6	NA	NA	6
Sediment Total				3E-04	NA	NA	3E-04		6	NA	NA	6
Receptor Total				3E-04	NA	NA	3E-04		6	NA	NA	6

NA - Not applicable/not available

GI = Gastrointestinal
NOE = No Observed Effect

Total Blood HI Across Media =	0.1
Total Reproduction HI Across Media =	**3**
Total GI System HI Across Media =	0.2
Total Kidney HI Across Media =	0.2
Total Liver HI Across Media =	0.006
Total Nervous System HI Across Media =	2E-04
Total Body Weight HI Across Media =	0.2
Total Skin HI Across Media =	0.01
Total NOE HI Across Media =	2E-04
Total Kidney HI Across Media =	0.2
Total Eyes HI Across Media =	**3**
Total Finger Nails HI Across Media =	**3**

Table 9.14.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Crab	Cadmium	NA	NA	NA	NA	Kidney	0.4	NA	NA	0.4
			Chromium	NA	NA	NA	NA	NOE	4.4E-04	NA	NA	4.4E-04
			Copper	NA	NA	NA	NA	GI system	0.3	NA	NA	0.3
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.4	NA	NA	0.4
			Silver	NA	NA	NA	NA	Skin	0.02	NA	NA	0.02
			Zinc	NA	NA	NA	NA	Blood	0.1	NA	NA	0.1
			4,4'-DDD	5E-06	NA	NA	5E-06	NA	NA	NA	NA	NA
			4,4'-DDE	1E-04	NA	NA	1E-04	NA	NA	NA	NA	NA
			4,4'-DDT	3E-07	NA	NA	3E-07	Liver	0.01	NA	NA	0.01
			Tetrachloroethene	6E-10	NA	NA	6E-10	Nervous System	3.5E-04	NA	NA	3.5E-04
			Dioxin-Like PCBs	6E-05	NA	NA	6E-05	Reproduction	4.8E+00	NA	NA	5
			Non Dioxin-Like PCBs	3E-05	NA	NA	3E-05	Finger nails, Eyes	5.2E+00	NA	NA	5
		Exposure Point Total		2E-04	NA	NA	2E-04		11	NA	NA	11
	Exposure Medium Total			2E-04	NA	NA	2E-04		11	NA	NA	11
Sediment Total				2E-04	NA	NA	2E-04		11	NA	NA	11
Receptor Total				2E-04	NA	NA	2E-04		11	NA	NA	11

NA - Not applicable/not available

GI = Gastrointestinal
NOE = No Observed Effect

Total Blood HI Across Media =	0.1
Total Reproduction HI Across Media =	**5**
Total GI System HI Across Media =	0.3
Total Kidney HI Across Media =	0.4
Total Liver HI Across Media =	0.01
Total Nervous System HI Across Media =	4E-04
Total Body Weight HI Across Media =	0.4
Total Skin HI Across Media =	0.02
Total NOE HI Across Media =	4E-04
Total Kidney HI Across Media =	0.4
Total Eyes HI Across Media =	**5**
Total Finger Nails HI Across Media =	**5**

Table 9.15.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Crab	Cadmium	NA	NA	NA	NA	Kidney	0.6	NA	NA	0.6
			Chromium	NA	NA	NA	NA	NOE	5.7E-04	NA	NA	5.7E-04
			Copper	NA	NA	NA	NA	GI system	0.4	NA	NA	0.4
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.5	NA	NA	0.5
			Silver	NA	NA	NA	NA	Skin	0.03	NA	NA	0.03
			Zinc	NA	NA	NA	NA	Blood	0.2	NA	NA	0.2
			4,4'-DDD	4E-06	NA	NA	4E-06	NA	NA	NA	NA	NA
			4,4'-DDE	9E-05	NA	NA	9E-05	NA	NA	NA	NA	NA
			4,4'-DDT	2E-07	NA	NA	2E-07	Liver	0.01	NA	NA	0.01
			Tetrachloroethene	5E-10	NA	NA	5E-10	Nervous System	4.6E-04	NA	NA	4.6E-04
			Dioxin-Like PCBs	5E-05	NA	NA	5E-05	Reproduction	6.3E+00	NA	NA	6
			Non Dioxin-Like PCBs	2E-05	NA	NA	2E-05	Finger nails, Eyes	6.8E+00	NA	NA	7
		Exposure Point Total		2E-04	NA	NA	2E-04		15	NA	NA	15
	Exposure Medium Total			2E-04	NA	NA	2E-04		15	NA	NA	15
Sediment Total				2E-04	NA	NA	2E-04		15	NA	NA	15
Receptor Total				2E-04	NA	NA	2E-04		15	NA	NA	15

NA - Not applicable/not available

GI = Gastrointestinal
NOE = No Observed Effect

Total Blood HI Across Media =	0.2
Total Reproduction HI Across Media =	**6**
Total GI System HI Across Media =	0.4
Total Kidney HI Across Media =	0.6
Total Liver HI Across Media =	0.01
Total Nervous System HI Across Media =	5E-04
Total Body Weight HI Across Media =	0.5
Total Skin HI Across Media =	0.03
Total NOE HI Across Media =	6E-04
Total Kidney HI Across Media =	0.6
Total Eyes HI Across Media =	**7**
Total Finger Nails HI Across Media =	**7**

Table 10.10.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Fish	Dioxin-Like PCBs	8E-04	NA	NA	8E-04	Reproduction	2.6E+01	NA	NA	26
			Non Dioxin-Like PCBs	4E-04	NA	NA	4E-04	Finger nails, Eyes	3.1E+01	NA	NA	31
		Exposure Point Total		1E-03	NA	NA	1E-03		57	NA	NA	57
	Exposure Medium Total			1E-03	NA	NA	1E-03		57	NA	NA	57
Sediment Total				1E-03	NA	NA	1E-03		57	NA	NA	57
Receptor Total				1E-03	NA	NA	1E-03		57	NA	NA	57

Total Reproduction HI Across Media =	**26**
Total Eyes HI Across Media =	**31**
Total Finger Nails HI Across Media =	**31**

Table 10.11.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Fish	Dioxin-Like PCBs	6E-04	NA	NA	6E-04	Reproduction	4.7E+01	NA	NA	47
			Non Dioxin-Like PCBs	3E-04	NA	NA	3E-04	Finger nails, Eyes	5.5E+01	NA	NA	55
		Exposure Point Total		9E-04	NA	NA	9E-04		102	NA	NA	102
	Exposure Medium Total			9E-04	NA	NA	9E-04		102	NA	NA	102
Sediment Total				9E-04	NA	NA	9E-04		102	NA	NA	102
Receptor Total				9E-04	NA	NA	9E-04		102	NA	NA	102

Total Reproduction HI Across Media =	**47**
Total Eyes HI Across Media =	**55**
Total Finger Nails HI Across Media =	**55**

Table 10.12.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Fish	Dioxin-Like PCBs	5E-04	NA	NA	5E-04	Reproduction	6.1E+01	NA	NA	61
			Non Dioxin-Like PCBs	2E-04	NA	NA	2E-04	Finger nails, Eyes	7.2E+01	NA	NA	72
		Exposure Point Total		7E-04	NA	NA	7E-04		133	NA	NA	133
	Exposure Medium Total			7E-04	NA	NA	7E-04		133	NA	NA	133
Sediment Total				7E-04	NA	NA	7E-04		133	NA	NA	133
Receptor Total				7E-04	NA	NA	7E-04		133	NA	NA	133

Total Reproduction HI Across Media =	**61**
Total Eyes HI Across Media =	**72**
Total Finger Nails HI Across Media =	**72**

Table 10.13.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Crab	Dioxin-Like PCBs	8E-05	NA	NA	8E-05	Reproduction	2.7E+00	NA	NA	3
			Non Dioxin-Like PCBs	4E-05	NA	NA	4E-05	Finger nails, Eyes	2.9E+00	NA	NA	3
		Exposure Point Total		1E-04	NA	NA	1E-04		6	NA	NA	6
	Exposure Medium Total			1E-04	NA	NA	1E-04		6	NA	NA	6
Sediment Total				1E-04	NA	NA	1E-04		6	NA	NA	6
Receptor Total				1E-04	NA	NA	1E-04		6	NA	NA	6

NA - Not applicable/not available

Total Reproduction HI Across Media =	**3**
Total Eyes HI Across Media =	**3**
Total Finger Nails HI Across Media =	**3**

Table 10.14.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Crab	Dioxin-Like PCBs	6E-05	NA	NA	6E-05	Reproduction	4.8E+00	NA	NA	5
			Non Dioxin-Like PCBs	3E-05	NA	NA	3E-05	Finger nails, Eyes	5.2E+00	NA	NA	5
		Exposure Point Total		9E-05	NA	NA	9E-05		10	NA	NA	10
	Exposure Medium Total			9E-05	NA	NA	9E-05		10	NA	NA	10
Sediment Total				9E-05	NA	NA	9E-05		10	NA	NA	10
Receptor Total				9E-05	NA	NA	9E-05		10	NA	NA	10

NA - Not applicable/not available

Total Reproduction HI Across Media =	**5**
Total Eyes HI Across Media =	**5**
Total Finger Nails HI Across Media =	**5**

Table 10.15.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

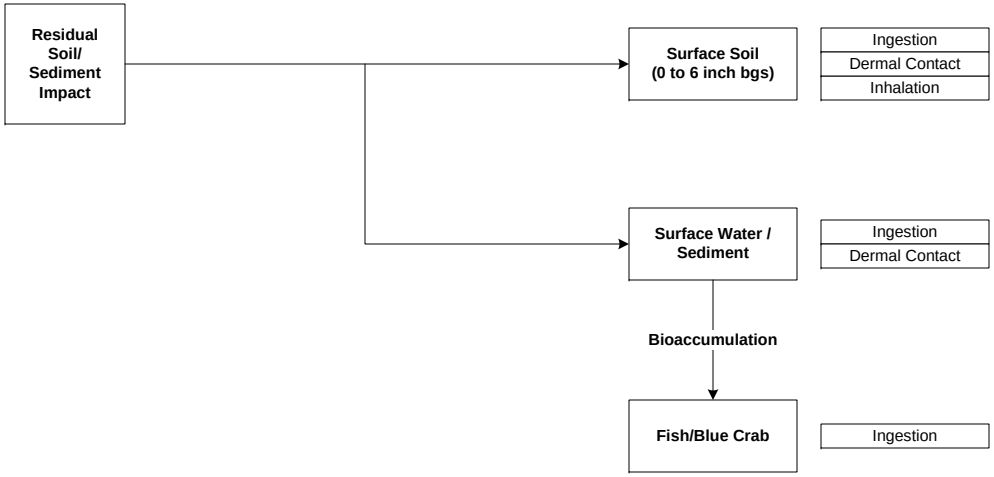
Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Crab	Dioxin-Like PCBs	5E-05	NA	NA	5E-05	Reproduction	6.3E+00	NA	NA	6
			Non Dioxin-Like PCBs	2E-05	NA	NA	2E-05	Finger nails, Eyes	6.8E+00	NA	NA	7
		Exposure Point Total		7E-05	NA	NA	7E-05		13	NA	NA	13
	Exposure Medium Total			7E-05	NA	NA	7E-05		13	NA	NA	13
Sediment Total				7E-05	NA	NA	7E-05		13	NA	NA	13
Receptor Total				7E-05	NA	NA	7E-05		13	NA	NA	13

NA - Not applicable/not available

Total Reproduction HI Across Media =	**6**
Total Eyes HI Across Media =	**7**
Total Finger Nails HI Across Media =	**7**

Attachment E-2
Figures



Primary Source	Primary Release Mechanism	Secondary Source	Secondary Release Mechanism	Exposure Media	Exposure Route	Potential Human Receptors										
						Current/Future						Future				
						Recreational User/ Trespasser/ Site Visitor			Fish/Blue Crab Consumer			Maintenance Worker	Industrial Worker	Construction Worker	Residential	
						Adult	Youth	Child	Adult	Youth	Child				Adult	Child
Residual Soil/ Sediment Impact				Surface Soil (0 to 6 inch bgs)	Ingestion	X	X	X				X	X	X	X	X
					Dermal Contact	X	X	X				X	X	X	X	X
					Inhalation	X	X	X				X	X	X	X	X
				Surface Water / Sediment	Ingestion	X	X	X								
					Dermal Contact	X	X	X								
				Fish/Blue Crab	Ingestion				X	X	X					

Legend
X – Potentially complete exposure pathways identified

Figure 1
Conceptual Site Model for HHRA
SWMU 6
Vieques, Puerto Rico

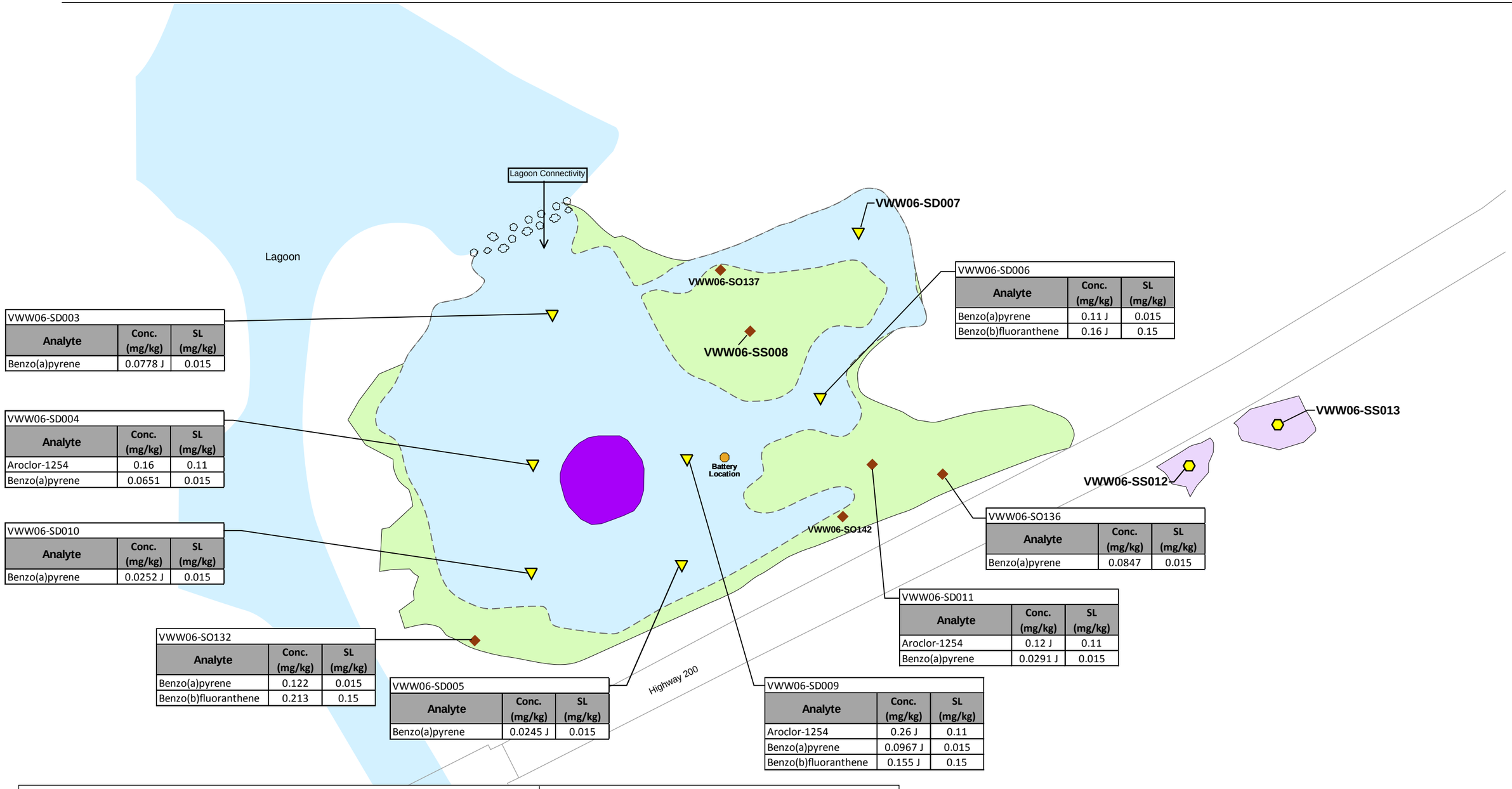
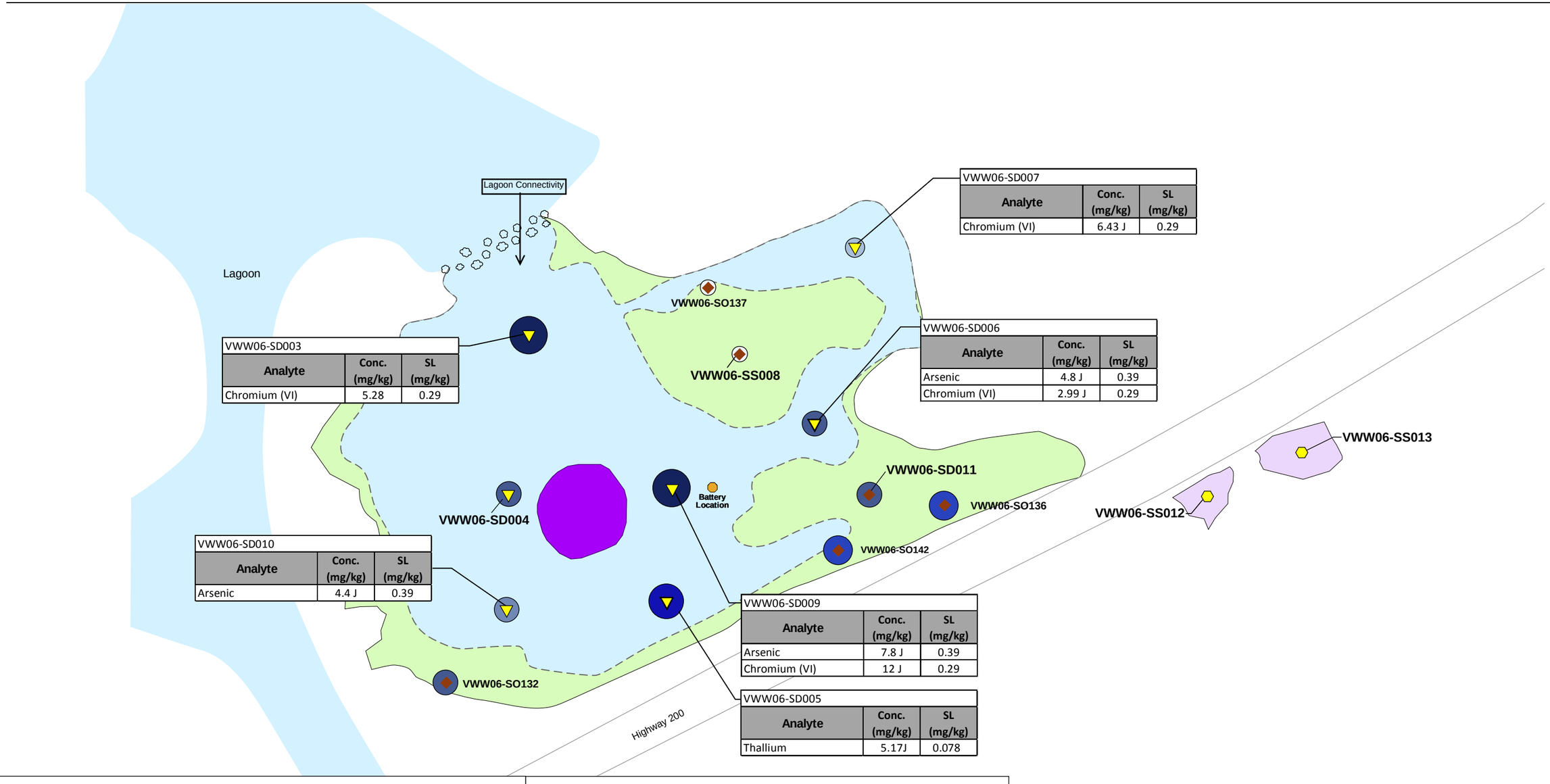


FIGURE 2
Soil and Sediment Sampling Stations with Detected PAH and PCB Concentrations Exceeding Adjusted Residential Soil RSLs
SWMU 6
Vieques, Puerto Rico



Legend

Sample Locations

- Surface Soil Sample
- Sediment/Soil Sample
- Soil Samples (for PCB analysis only)
- Approximate Original Battery Location
- Shallow, Sparse Mangroves
- Lead Hot Spot Excavation Area
- Lagoon Outline Low Tide (Approximate)
- Removal Area South of Road
- SWMU 6 Disturbed Area

North

0 15 30 Feet

Notes:

Adjusted EPA Regional Screening Levels (RSLs) for residential soil (EPA, 05/2012; based on ELCR = $1x10^{-6}$ or HQ=0.1) were used as screening levels (SLs).

Metal concentrations exceeding 10x SLs are presented in boxes.

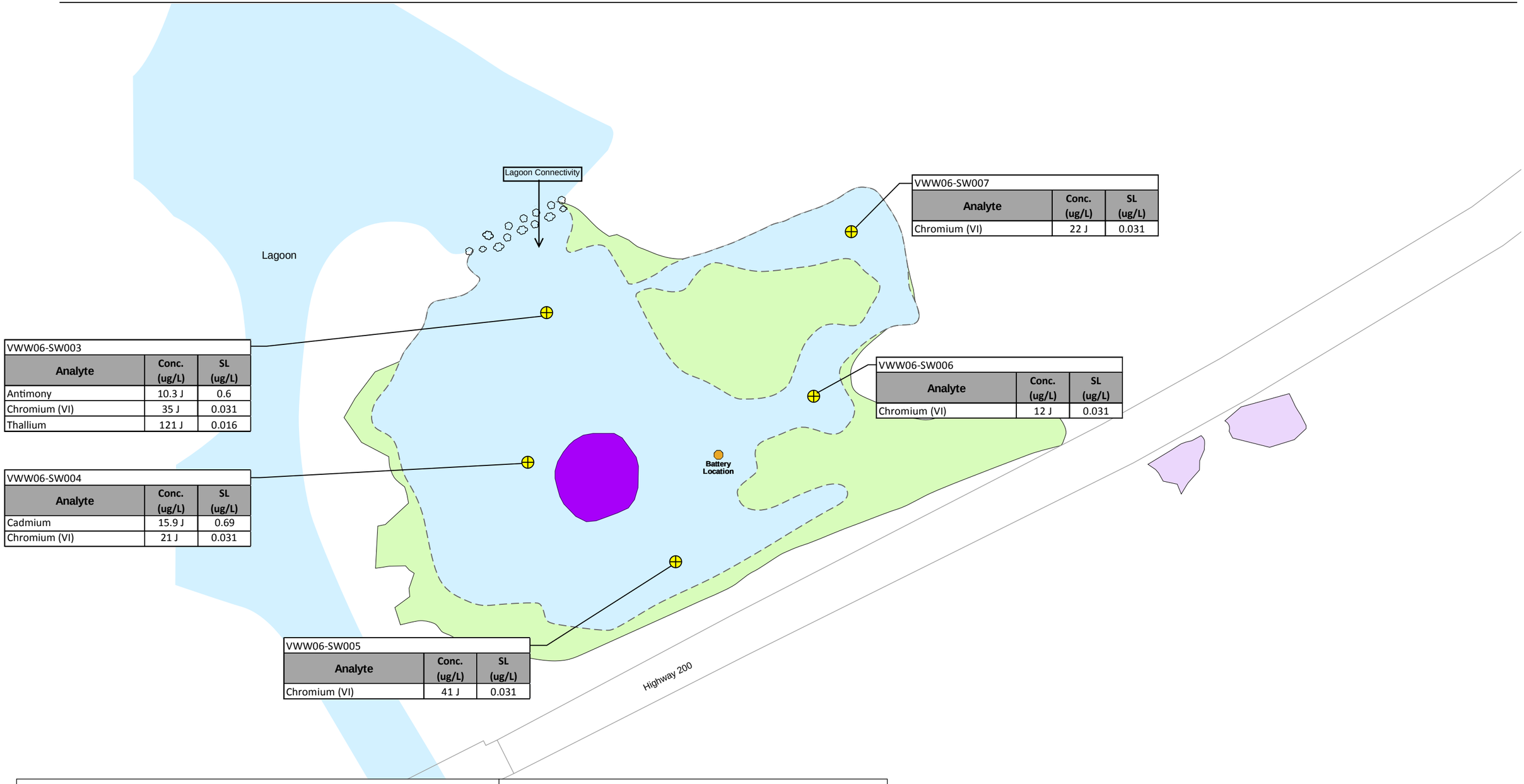
Sampling stations where metal concentrations exceeded SLs are color-coded based on the number of metals exceedances as follows:

8 7 6 5 4 3 2

Metals exceeding SLs include aluminum, antimony, arsenic, chromium (VI), cobalt, iron, lead, manganese, thallium, and vanadium.

HQ = Hazard Quotient
ELCR = Excess Lifetime Cancer Risk
J = Compound was detected below the reporting limit in the sample

FIGURE 3
Soil and Sediment Sampling Stations with Detected Metal Concentrations Exceeding Adjusted Residential Soil RSLs
SWMU 6
Vieques, Puerto Rico



VWW06-SW007

Analyte	Conc. (ug/L)	SL (ug/L)
Chromium (VI)	22 J	0.031

VWW06-SW003

Analyte	Conc. (ug/L)	SL (ug/L)
Antimony	10.3 J	0.6
Chromium (VI)	35 J	0.031
Thallium	121 J	0.016

VWW06-SW006

Analyte	Conc. (ug/L)	SL (ug/L)
Chromium (VI)	12 J	0.031

VWW06-SW004

Analyte	Conc. (ug/L)	SL (ug/L)
Cadmium	15.9 J	0.69
Chromium (VI)	21 J	0.031

VWW06-SW005

Analyte	Conc. (ug/L)	SL (ug/L)
Chromium (VI)	41 J	0.031

Legend

Sample Locations

- Surface Water Sample
- Shallow, Sparse Mangroves
- North
- 0 15 30 Feet
- Lead Hot Spot Excavation Area
- Lagoon Outline Low Tide (Approximate)
- Removal Area South of Road
- SWMU 6 Disturbed Area

Notes:

Adjusted EPA Regional Screening Levels (RSLs) for tapwater (EPA, 05/2012; based on ELCR=1x10^{-6} or HQ=0.1) were used as screening levels (SLs).

Concentrations exceeding 10x SLs are presented in boxes.

HQ = Hazard Quotient
ELCR = Excess Lifetime Cancer Risk
J = Compound was detected below the reporting limit in the sample

FIGURE 4
Surface Water Sampling Stations with Detected Concentrations Exceeding Adjusted Tapwater RSLs
SWMU 6
Vieques, Puerto Rico

Attachment E-3
Tables

Table 1
HHRA Sample Assignment Descriptions and Counts
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

AOC_ID	Description	Sample Count
SWMU6_SW	SWMU6 Surface Water Samples	5
SWMU6_SS_PCB	SWMU6 Surface Soil in the PCB Removal Area	2
SWMU6_SS_North	SWMU6 Surface Soil + intermittently-inundated sediment North Area	6
SWMU6_SED	SWMU6 Low Tide Area Sediment	7
SWMU6_Fish	SWMU6 Fish Tissue (Lagoon)	4
SWMU6_BlueCrab	SWMU6 Blue Crab (Lagoon)	4

Table 2
HHRA Sample Assignments
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

AOC ID	StationID	SampleID	Upper Depth (feet)	Lower Depth (feet)	Date Collected	Matrix	Note
SWMU6_SED	VWW06-SD003	VWW06-SD003-0211	0	0.5	02/04/11	SD	
SWMU6_SED	VWW06-SD004	VWW06-SD004-0211	0	0.5	02/04/11	SD	
SWMU6_SED	VWW06-SD005	VWW06-SD005-0211	0	0.5	02/04/11	SD	
SWMU6_SED	VWW06-SD006	VWW06-SD006-0211	0	0.5	02/04/11	SD	
SWMU6_SED	VWW06-SD007	VWW06-SD007-0211	0	0.5	02/04/11	SD	
SWMU6_SED	VWW06-SD009	VWW06-SD009-0211	0	0.5	02/04/11	SD	
SWMU6_SED	VWW06-SD010	VWW06-SD010-0211	0	0.6	02/04/11	SD	
SWMU6_SS_North	VWW06-SO132	116701-06-Z-132	0	0.5	06/24/09	SS	VOC (1)
SWMU6_SS_North	VWW06-SO136	116701-06-Z-136	0	0.5	06/24/09	SS	VOC (1)
SWMU6_SS_North	VWW06-SO137	116701-06-Z-137	0	0.5	06/24/09	SS	VOC (1)
SWMU6_SS_North	VWW06-SO142	116701-06-Z-142	0	0.5	06/24/09	SS	VOC (1)
SWMU6_SS_North	VWW06-SS008	VWW06-SS008-0211	0	0.5	02/04/11	SS	
SWMU6_SS_North	VWW06-SD011	VWW06-SD011-0211	0	0.5	02/04/11	SS	
SWMU6_SS_PCB	VWW06-SS012	VWW06-SS012-0211	0	0.5	02/07/11	SS	
SWMU6_SS_PCB	VWW06-SS013	VWW06-SS013-0211	0	0.5	02/07/11	SS	
SWMU6_SW	VWW06-SW003	VWW06-SW003-0211	0	0.6	02/03/11	SW	
SWMU6_SW	VWW06-SW004	VWW06-SW004-0211	0	0.8	02/03/11	SW	
SWMU6_SW	VWW06-SW005	VWW06-SW005-0211	0	0.2	02/03/11	SW	
SWMU6_SW	VWW06-SW006	VWW06-SW006-0211	0	0.4	02/03/11	SW	
SWMU6_SW	VWW06-SW007	VWW06-SW007-0211	0	0.36	02/03/11	SW	
SWMU6_BlueCrab	VWW06-CRB01	VWW06-CRB01-0112	NA	NA	01/31/12	TI_BC	
SWMU6_BlueCrab	VWW06-CRB02	VWW06-CRB02-0112	NA	NA	01/31/12	TI_BC	
SWMU6_BlueCrab	VWW06-CRB03	VWW06-CRB03-0112	NA	NA	01/31/12	TI_BC	
SWMU6_BlueCrab	VWW06-CRB04	VWW06-CRB04-0112	NA	NA	01/31/12	TI_BC	
SWMU6_Fish	VWW06-FS01	VWW06-FS01-0112	NA	NA	01/31/12	TI_F	Snook
SWMU6_Fish	VWW06-FS02	VWW06-FS02-0212	NA	NA	02/01/12	TI_F	Snook
SWMU6_Fish	VWW06-FS03	VWW06-FS03-0212	NA	NA	02/01/12	TI_F	Mullet
SWMU6_Fish	VWW06-FS04	VWW06-FS04-0112	NA	NA	01/31/12	TI_F	Mullet

(1) Due to the uncertainty associated with historical VOC data, VOC data associated with the most recent sampling event are used.

Matrix Definitions

SD =	Sediment
SS =	Surface Soil
SW =	Surface Water
TI =	Biological Tissue (BC-Blue Crab; F-Fish)

VOC: volatile organic compound

Table 3
Calculation of Site-Specific Total Organic Carbon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

StationID	SampleID	DateCollected	Analyte	Result	Qual	Units
VWW06-SD003	VWW06-SD003-0211	04-Feb-11	Total organic carbon (TOC)	18000	J	mg/kg
VWW06-SD004	VWW06-SD004-0211	04-Feb-11	Total organic carbon (TOC)	16000	J	mg/kg
VWW06-SD005	VWW06-SD005-0211	04-Feb-11	Total organic carbon (TOC)	13000	J	mg/kg
VWW06-SD006	VWW06-SD006-0211	04-Feb-11	Total organic carbon (TOC)	16000	J	mg/kg
VWW06-SD007	VWW06-SD007-0211	04-Feb-11	Total organic carbon (TOC)	13000	J	mg/kg
VWW06-SD009	VWW06-SD009-0211	04-Feb-11	Total organic carbon (TOC)	24000	J	mg/kg
VWW06-SD010	VWW06-SD010-0211	04-Feb-11	Total organic carbon (TOC)	6700	=	mg/kg
VWW06-SD001	VWW06-SD001-0211	08-Feb-11	Total organic carbon (TOC)	35000	J	mg/kg
VWW06-SD002	VWW06-SD002-0211	08-Feb-11	Total organic carbon (TOC)	45000	J	mg/kg

Total Organic Carbon (TOC) % 2.1%

Note:
Site specific TOC percentage is the average of site sediment concentrations.

Table 4-1-1

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Surface Water/Sediment Fish (Lagoon)	Ingestion	Cadmium	2.6E-01	mg/kg-fish	8.1E-05	mg/kg-day	NA	NA	NA	2.4E-04	mg/kg-day	1.0E-03	mg/kg-day	0.2
				Chromium	4.0E-01	mg/kg-fish	1.3E-04	mg/kg-day	NA	NA	NA	3.7E-04	mg/kg-day	1.5E+00	mg/kg-day	2.5E-04
				Copper	7.1E+00	mg/kg-fish	2.3E-03	mg/kg-day	NA	NA	NA	6.6E-03	mg/kg-day	4.0E-02	mg/kg-day	0.2
				Lead	5.2E-01	mg/kg-fish	1.6E-04	mg/kg-day	NA	NA	NA	4.8E-04	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.5E-03	mg/kg-day	NA	NA	NA	4.4E-03	mg/kg-day	2.0E-02	mg/kg-day	0.2
				Silver	7.4E-02	mg/kg-fish	2.3E-05	mg/kg-day	NA	NA	NA	6.8E-05	mg/kg-day	5.0E-03	mg/kg-day	0.01
				Zinc	1.7E+01	mg/kg-fish	5.4E-03	mg/kg-day	NA	NA	NA	1.6E-02	mg/kg-day	3.0E-01	mg/kg-day	0.1
				4,4'-DDD	8.9E-03	mg/kg-fish	2.8E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	6.8E-07	8.3E-06	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	2.6E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	8.7E-05	7.5E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	1.4E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.8E-08	4.1E-07	mg/kg-day	5.0E-04	mg/kg-day	8.2E-04
				Tetrachloroethene	1.7E-03	mg/kg-fish	5.3E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	1.1E-09	1.5E-06	mg/kg-day	6.0E-03	mg/kg-day	2.6E-04
				Dioxin-Like PCBs	1.8E-05	mg/kg-fish	5.5E-09	mg/kg-day	1.3E+05	1/(mg/kg-day)	7.2E-04	1.6E-08	mg/kg-day	7.0E-10	mg/kg-day	23
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	2.1E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	4.2E-04	6.1E-04	mg/kg-day	2.0E-05	mg/kg-day	31
			Exp. Route Total								1.2E-03					54
		Exposure Point Total									1.2E-03					54
	Exposure Medium Total										1.2E-03					54
Sediment Total											1.2E-03					54
Receptor Total											1.2E-03					54

NA = Not applicable.

Table 4-1-2

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Surface Water/Sediment Fish (Lagoon)	Ingestion	Cadmium	2.6E-01	mg/kg-fish	6.1E-05	mg/kg-day	NA	NA	NA	4.2E-04	mg/kg-day	1.0E-03	mg/kg-day	0.4
				Chromium	4.0E-01	mg/kg-fish	9.4E-05	mg/kg-day	NA	NA	NA	6.6E-04	mg/kg-day	1.5E+00	mg/kg-day	4.4E-04
				Copper	7.1E+00	mg/kg-fish	1.7E-03	mg/kg-day	NA	NA	NA	1.2E-02	mg/kg-day	4.0E-02	mg/kg-day	0.3
				Lead	5.2E-01	mg/kg-fish	1.2E-04	mg/kg-day	NA	NA	NA	8.6E-04	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.1E-03	mg/kg-day	NA	NA	NA	7.9E-03	mg/kg-day	2.0E-02	mg/kg-day	0.4
				Silver	7.4E-02	mg/kg-fish	1.7E-05	mg/kg-day	NA	NA	NA	1.2E-04	mg/kg-day	5.0E-03	mg/kg-day	0.02
				Zinc	1.7E+01	mg/kg-fish	4.0E-03	mg/kg-day	NA	NA	NA	2.8E-02	mg/kg-day	3.0E-01	mg/kg-day	0
				4,4'-DDD	8.9E-03	mg/kg-fish	2.1E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	5.1E-07	1.5E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	1.9E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	6.5E-05	1.3E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	1.0E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.6E-08	7.3E-07	mg/kg-day	5.0E-04	mg/kg-day	0.001
				Tetrachloroethene	1.7E-03	mg/kg-fish	3.9E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	8.3E-10	2.8E-06	mg/kg-day	6.0E-03	mg/kg-day	4.6E-04
				Dioxin-Like PCBs	1.8E-05	mg/kg-fish	4.2E-09	mg/kg-day	1.3E+05	1/(mg/kg-day)	5.4E-04	2.9E-08	mg/kg-day	7.0E-10	mg/kg-day	42
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	1.6E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	3.1E-04	1.1E-03	mg/kg-day	2.0E-05	mg/kg-day	55
			Exp. Route Total								9.2E-04					98
		Exposure Point Total									9.2E-04					98
	Exposure Medium Total										9.2E-04					98
Sediment Total											9.2E-04					98
Receptor Total											9.2E-04					98

NA = Not applicable.

Table 4-1-3
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Surface Water/Sediment Fish (Lagoon)	Ingestion	Cadmium	2.6E-01	mg/kg-fish	4.8E-05	mg/kg-day	NA	NA	NA	5.5E-04	mg/kg-day	1.0E-03	mg/kg-day	0.6
				Chromium	4.0E-01	mg/kg-fish	7.4E-05	mg/kg-day	NA	NA	NA	8.6E-04	mg/kg-day	1.5E+00	mg/kg-day	5.7E-04
				Copper	7.1E+00	mg/kg-fish	1.3E-03	mg/kg-day	NA	NA	NA	1.5E-02	mg/kg-day	4.0E-02	mg/kg-day	0.4
				Lead	5.2E-01	mg/kg-fish	9.6E-05	mg/kg-day	NA	NA	NA	1.1E-03	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	8.9E-04	mg/kg-day	NA	NA	NA	1.0E-02	mg/kg-day	2.0E-02	mg/kg-day	0.5
				Silver	7.4E-02	mg/kg-fish	1.4E-05	mg/kg-day	NA	NA	NA	1.6E-04	mg/kg-day	5.0E-03	mg/kg-day	0.03
				Zinc	1.7E+01	mg/kg-fish	3.1E-03	mg/kg-day	NA	NA	NA	3.7E-02	mg/kg-day	3.0E-01	mg/kg-day	0.1
				4,4'-DDD	8.9E-03	mg/kg-fish	1.7E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	4.0E-07	1.9E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	1.5E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	5.1E-05	1.7E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	8.2E-08	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.8E-08	9.6E-07	mg/kg-day	5.0E-04	mg/kg-day	0.002
				Tetrachloroethene	1.7E-03	mg/kg-fish	3.1E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	6.5E-10	3.6E-06	mg/kg-day	6.0E-03	mg/kg-day	6.0E-04
				Dioxin-Like PCBs	1.8E-05	mg/kg-fish	3.3E-09	mg/kg-day	1.3E+05	1/(mg/kg-day)	4.2E-04	3.8E-08	mg/kg-day	7.0E-10	mg/kg-day	54
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	1.2E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	2.5E-04	1.4E-03	mg/kg-day	2.0E-05	mg/kg-day	72
			Exp. Route Total								7.2E-04					128
		Exposure Point Total									7.2E-04					128
	Exposure Medium Total										7.2E-04					128
Sediment Total											7.2E-04					128
Receptor Total											7.2E-04					128

NA = Not applicable.

Table 4-1-4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Surface Water/Sediment Fish (Lagoon)	Cadmium	NA	NA	NA	NA	Kidney	0.2	NA	NA	0.2
			Chromium	NA	NA	NA	NA	NOE	2.5E-04	NA	NA	2.5E-04
			Copper	NA	NA	NA	NA	GI system	0.2	NA	NA	0.2
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.2	NA	NA	0.2
			Silver	NA	NA	NA	NA	Skin	0.01	NA	NA	0.01
			Zinc	NA	NA	NA	NA	Blood	0.1	NA	NA	0.1
			4,4'-DDD	7E-07	NA	NA	7E-07	NA	NA	NA	NA	NA
			4,4'-DDE	9E-05	NA	NA	9E-05	NA	NA	NA	NA	NA
			4,4'-DDT	5E-08	NA	NA	5E-08	Liver	8.2E-04	NA	NA	8.2E-04
			Tetrachloroethene	1E-09	NA	NA	1E-09	Nervous System	2.6E-04	NA	NA	2.6E-04
			Dioxin-Like PCBs	7E-04	NA	NA	7E-04	Reproduction	2.3E+01	NA	NA	23
			Non Dioxin-Like PCBs	4E-04	NA	NA	4E-04	Finger nails, Eyes	3.1E+01	NA	NA	31
		Exposure Point Total		1E-03	NA	NA	1E-03		54	NA	NA	54
	Exposure Medium Total			1E-03	NA	NA	1E-03		54	NA	NA	54
Sediment Total				1E-03	NA	NA	1E-03		54	NA	NA	54
Receptor Total				1E-03	NA	NA	1E-03		54	NA	NA	54

Total Blood HI Across Media =	0.1
Total Reproduction HI Across Media =	**23**
Total GI System HI Across Media =	0.2
Total Kidney HI Across Media =	0.2
Total Liver HI Across Media =	8E-04
Total Nervous System HI Across Media =	3E-04
Total Body Weight HI Across Media =	0.2
Total Skin HI Across Media =	0.01
Total NOE HI Across Media =	2E-04
Total Kidney HI Across Media =	0.2
Total Eyes HI Across Media =	**31**
Total Finger Nails HI Across Media =	**31**

GI = Gastrointestinal
NA - Not applicable/not available
NOE = No Observed Effect

Table 4-1-5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Surface Water/Sediment Fish (Lagoon)	Cadmium	NA	NA	NA	NA	Kidney	0.4	NA	NA	0.4
			Chromium	NA	NA	NA	NA	NOE	4.4E-04	NA	NA	4.4E-04
			Copper	NA	NA	NA	NA	GI system	0.3	NA	NA	0.3
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.4	NA	NA	0.4
			Silver	NA	NA	NA	NA	Skin	0.02	NA	NA	0.02
			Zinc	NA	NA	NA	NA	Blood	0.09	NA	NA	0.09
			4,4'-DDD	5E-07	NA	NA	5E-07	NA	NA	NA	NA	NA
			4,4'-DDE	7E-05	NA	NA	7E-05	NA	NA	NA	NA	NA
			4,4'-DDT	4E-08	NA	NA	4E-08	Liver	0.001	NA	NA	0.001
			Tetrachloroethene	8E-10	NA	NA	8E-10	Nervous System	4.6E-04	NA	NA	4.6E-04
			Dioxin-Like PCBs	5E-04	NA	NA	5E-04	Reproduction	4.2E+01	NA	NA	42
			Non Dioxin-Like PCBs	3E-04	NA	NA	3E-04	Finger nails, Eyes	5.5E+01	NA	NA	55
		Exposure Point Total		9E-04	NA	NA	9E-04		98	NA	NA	98
	Exposure Medium Total			9E-04	NA	NA	9E-04		98	NA	NA	98
Sediment Total				9E-04	NA	NA	9E-04		98	NA	NA	98
Receptor Total				9E-04	NA	NA	9E-04		98	NA	NA	98

Total Blood HI Across Media =	0.09
Total Reproduction HI Across Media =	**42**
Total GI System HI Across Media =	0.3
Total Kidney HI Across Media =	0.4
Total Liver HI Across Media =	0.001
Total Nervous System HI Across Media =	5E-04
Total Body Weight HI Across Media =	0.4
Total Skin HI Across Media =	0.02
Total NOE HI Across Media =	4E-04
Total Kidney HI Across Media =	0.4
Total Eyes HI Across Media =	**55**
Total Finger Nails HI Across Media =	**55**

GI = Gastrointestinal
NA - Not applicable/not available
NOE = No Observed Effect

Table 4-1-6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Fish (Lagoon)	Surface Water/Sediment Fish (Lagoon)	Cadmium	NA	NA	NA	NA	Kidney	0.6	NA	NA	0.6
			Chromium	NA	NA	NA	NA	NOE	5.7E-04	NA	NA	5.7E-04
			Copper	NA	NA	NA	NA	GI system	0.4	NA	NA	0.4
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.5	NA	NA	0.5
			Silver	NA	NA	NA	NA	Skin	0.03	NA	NA	0.03
			Zinc	NA	NA	NA	NA	Blood	0.1	NA	NA	0.1
			4,4'-DDD	4E-07	NA	NA	4E-07	NA	NA	NA	NA	NA
			4,4'-DDE	5E-05	NA	NA	5E-05	NA	NA	NA	NA	NA
			4,4'-DDT	3E-08	NA	NA	3E-08	Liver	0.002	NA	NA	0.002
			Tetrachloroethene	6E-10	NA	NA	6E-10	Nervous System	6.0E-04	NA	NA	6.0E-04
			Dioxin-Like PCBs	4E-04	NA	NA	4E-04	Reproduction	5.4E+01	NA	NA	54
			Non Dioxin-Like PCBs	2E-04	NA	NA	2E-04	Finger nails, Eyes	7.2E+01	NA	NA	72
		Exposure Point Total		7E-04	NA	NA	7E-04		128	NA	NA	128
	Exposure Medium Total			7E-04	NA	NA	7E-04		128	NA	NA	128
Sediment Total				7E-04	NA	NA	7E-04		128	NA	NA	128
Receptor Total				7E-04	NA	NA	7E-04		128	NA	NA	128

Total Blood HI Across Media =	0.1
Total Reproduction HI Across Media =	**54**
Total GI System HI Across Media =	0.4
Total Kidney HI Across Media =	0.6
Total Liver HI Across Media =	0.002
Total Nervous System HI Across Media =	6E-04
Total Body Weight HI Across Media =	0.5
Total Skin HI Across Media =	0.03
Total NOE HI Across Media =	6E-04
Total Kidney HI Across Media =	0.6
Total Eyes HI Across Media =	**72**
Total Finger Nails HI Across Media =	**72**

GI = Gastrointestinal
NA - Not applicable/not available
NOE = No Observed Effect

Table 4-2-1

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Surface Water/Sediment Crab (Lagoon)	Ingestion	Cadmium	2.6E-01	mg/kg-fish	8.1E-05	mg/kg-day	NA	NA	NA	2.4E-04	mg/kg-day	1.0E-03	mg/kg-day	0.2
				Chromium	4.0E-01	mg/kg-fish	1.3E-04	mg/kg-day	NA	NA	NA	3.7E-04	mg/kg-day	1.5E+00	mg/kg-day	2.5E-04
				Copper	7.1E+00	mg/kg-fish	2.3E-03	mg/kg-day	NA	NA	NA	6.6E-03	mg/kg-day	4.0E-02	mg/kg-day	0.2
				Lead	3.2E+00	mg/kg-fish	1.0E-03	mg/kg-day	NA	NA	NA	3.0E-03	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.5E-03	mg/kg-day	NA	NA	NA	4.4E-03	mg/kg-day	2.0E-02	mg/kg-day	0.2
				Silver	7.4E-02	mg/kg-fish	2.3E-05	mg/kg-day	NA	NA	NA	6.8E-05	mg/kg-day	5.0E-03	mg/kg-day	0.01
				Zinc	2.7E+01	mg/kg-fish	8.4E-03	mg/kg-day	NA	NA	NA	2.5E-02	mg/kg-day	3.0E-01	mg/kg-day	0.1
				4,4'-DDD	8.0E-02	mg/kg-fish	2.5E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	6.1E-06	7.4E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	4.3E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.5E-04	1.3E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	1.0E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.4E-07	2.9E-06	mg/kg-day	5.0E-04	mg/kg-day	0.006
				Tetrachloroethene	1.3E-03	mg/kg-fish	4.0E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	8.4E-10	1.2E-06	mg/kg-day	6.0E-03	mg/kg-day	2.0E-04
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	6.3E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	8.2E-05	1.8E-09	mg/kg-day	7.0E-10	mg/kg-day	2.6
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	2.0E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	4.0E-05	5.8E-05	mg/kg-day	2.0E-05	mg/kg-day	2.9
			Exp. Route Total								2.7E-04					6
		Exposure Point Total									2.7E-04					6
	Exposure Medium Total										2.7E-04					6
Sediment Total											2.7E-04					6
Receptor Total											2.7E-04					6

NA = Not applicable.

Table 4-2-2

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Surface Water/Sediment Crab (Lagoon)	Ingestion	Cadmium	2.6E-01	mg/kg-fish	6.1E-05	mg/kg-day	NA	NA	NA	4.2E-04	mg/kg-day	1.0E-03	mg/kg-day	0.4
				Chromium	4.0E-01	mg/kg-fish	9.4E-05	mg/kg-day	NA	NA	NA	6.6E-04	mg/kg-day	1.5E+00	mg/kg-day	4.4E-04
				Copper	7.1E+00	mg/kg-fish	1.7E-03	mg/kg-day	NA	NA	NA	1.2E-02	mg/kg-day	4.0E-02	mg/kg-day	0.3
				Lead	3.2E+00	mg/kg-fish	7.6E-04	mg/kg-day	NA	NA	NA	5.4E-03	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.1E-03	mg/kg-day	NA	NA	NA	7.9E-03	mg/kg-day	2.0E-02	mg/kg-day	0.4
				Silver	7.4E-02	mg/kg-fish	1.7E-05	mg/kg-day	NA	NA	NA	1.2E-04	mg/kg-day	5.0E-03	mg/kg-day	0.02
				Zinc	2.7E+01	mg/kg-fish	6.3E-03	mg/kg-day	NA	NA	NA	4.4E-02	mg/kg-day	3.0E-01	mg/kg-day	0
				4,4'-DDD	8.0E-02	mg/kg-fish	1.9E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	4.6E-06	1.3E-04	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	3.2E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.1E-04	2.3E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	7.5E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.6E-07	5.3E-06	mg/kg-day	5.0E-04	mg/kg-day	0.01
				Tetrachloroethene	1.3E-03	mg/kg-fish	3.0E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	6.3E-10	2.1E-06	mg/kg-day	6.0E-03	mg/kg-day	3.5E-04
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	4.7E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	6.1E-05	3.3E-09	mg/kg-day	7.0E-10	mg/kg-day	4.7
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	1.5E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	3.0E-05	1.0E-04	mg/kg-day	2.0E-05	mg/kg-day	5.2
			Exp. Route Total								2.1E-04					11
		Exposure Point Total									2.1E-04					11
	Exposure Medium Total										2.1E-04					11
Sediment Total											2.1E-04					11
Receptor Total											2.1E-04					11

NA = Not applicable.

Table 4-2-3
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Surface Water/Sediment Crab (Lagoon)	Ingestion	Cadmium	2.6E-01	mg/kg-fish	4.8E-05	mg/kg-day	NA	NA	NA	5.5E-04	mg/kg-day	1.0E-03	mg/kg-day	0.6
				Chromium	4.0E-01	mg/kg-fish	7.4E-05	mg/kg-day	NA	NA	NA	8.6E-04	mg/kg-day	1.5E+00	mg/kg-day	5.7E-04
				Copper	7.1E+00	mg/kg-fish	1.3E-03	mg/kg-day	NA	NA	NA	1.5E-02	mg/kg-day	4.0E-02	mg/kg-day	0.4
				Lead	3.2E+00	mg/kg-fish	6.0E-04	mg/kg-day	NA	NA	NA	7.0E-03	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	8.9E-04	mg/kg-day	NA	NA	NA	1.0E-02	mg/kg-day	2.0E-02	mg/kg-day	0.5
				Silver	7.4E-02	mg/kg-fish	1.4E-05	mg/kg-day	NA	NA	NA	1.6E-04	mg/kg-day	5.0E-03	mg/kg-day	0.03
				Zinc	2.7E+01	mg/kg-fish	4.9E-03	mg/kg-day	NA	NA	NA	5.8E-02	mg/kg-day	3.0E-01	mg/kg-day	0.2
				4,4'-DDD	8.0E-02	mg/kg-fish	1.5E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	3.6E-06	1.7E-04	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	2.5E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	8.6E-05	2.9E-03	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	5.9E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.0E-07	6.9E-06	mg/kg-day	5.0E-04	mg/kg-day	0.01
				Tetrachloroethene	1.3E-03	mg/kg-fish	2.4E-07	mg/kg-day	2.1E-03	1/(mg/kg-day)	4.9E-10	2.7E-06	mg/kg-day	6.0E-03	mg/kg-day	4.6E-04
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	3.7E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	4.8E-05	4.3E-09	mg/kg-day	7.0E-10	mg/kg-day	6.2
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	1.2E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	2.3E-05	1.4E-04	mg/kg-day	2.0E-05	mg/kg-day	6.8
			Exp. Route Total								1.6E-04					15
		Exposure Point Total									1.6E-04					15
	Exposure Medium Total										1.6E-04					15
Sediment Total											1.6E-04					15
Receptor Total											1.6E-04					15

NA = Not applicable.

Table 4-2-4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Surface Water/Sediment Crab (Lagoon)	Cadmium	NA	NA	NA	NA	Kidney	0.2	NA	NA	0.2
			Chromium	NA	NA	NA	NA	NOE	2.5E-04	NA	NA	2.5E-04
			Copper	NA	NA	NA	NA	GI system	0.2	NA	NA	0.2
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.2	NA	NA	0.2
			Silver	NA	NA	NA	NA	Skin	0.01	NA	NA	0.01
			Zinc	NA	NA	NA	NA	Blood	0.1	NA	NA	0.1
			4,4'-DDD	6E-06	NA	NA	6E-06	NA	NA	NA	NA	NA
			4,4'-DDE	1E-04	NA	NA	1E-04	NA	NA	NA	NA	NA
			4,4'-DDT	3E-07	NA	NA	3E-07	Liver	0.006	NA	NA	0.006
			Tetrachloroethene	8E-10	NA	NA	8E-10	Nervous System	2.0E-04	NA	NA	2.0E-04
			Dioxin-Like PCBs	8E-05	NA	NA	8E-05	Reproduction	2.6E+00	NA	NA	3
			Non Dioxin-Like PCBs	4E-05	NA	NA	4E-05	Finger nails, Eyes	2.9E+00	NA	NA	3
		Exposure Point Total		3E-04	NA	NA	3E-04		6	NA	NA	6
	Exposure Medium Total			3E-04	NA	NA	3E-04		6	NA	NA	6
Sediment Total				3E-04	NA	NA	3E-04		6	NA	NA	6
Receptor Total				3E-04	NA	NA	3E-04		6	NA	NA	6

NA - Not applicable/not available

GI = Gastrointestinal

NOE = No Observed Effect

Total Blood HI Across Media =	0.1
Total Reproduction HI Across Media =	**3**
Total GI System HI Across Media =	0.2
Total Kidney HI Across Media =	0.2
Total Liver HI Across Media =	0.006
Total Nervous System HI Across Media =	2E-04
Total Body Weight HI Across Media =	0.2
Total Skin HI Across Media =	0.01
Total NOE HI Across Media =	2E-04
Total Kidney HI Across Media =	0.2
Total Eyes HI Across Media =	**3**
Total Finger Nails HI Across Media =	**3**

Table 4-2-5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Surface Water/Sediment Crab (Lagoon)	Cadmium	NA	NA	NA	NA	Kidney	0.4	NA	NA	0.4
			Chromium	NA	NA	NA	NA	NOE	4.4E-04	NA	NA	4.4E-04
			Copper	NA	NA	NA	NA	GI system	0.3	NA	NA	0.3
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.4	NA	NA	0.4
			Silver	NA	NA	NA	NA	Skin	0.02	NA	NA	0.02
			Zinc	NA	NA	NA	NA	Blood	0.1	NA	NA	0.1
			4,4'-DDD	5E-06	NA	NA	5E-06	NA	NA	NA	NA	NA
			4,4'-DDE	1E-04	NA	NA	1E-04	NA	NA	NA	NA	NA
			4,4'-DDT	3E-07	NA	NA	3E-07	Liver	0.01	NA	NA	0.01
			Tetrachloroethene	6E-10	NA	NA	6E-10	Nervous System	3.5E-04	NA	NA	3.5E-04
			Dioxin-Like PCBs	6E-05	NA	NA	6E-05	Reproduction	4.7E+00	NA	NA	5
			Non Dioxin-Like PCBs	3E-05	NA	NA	3E-05	Finger nails, Eyes	5.2E+00	NA	NA	5
		Exposure Point Total		2E-04	NA	NA	2E-04		11	NA	NA	11
	Exposure Medium Total			2E-04	NA	NA	2E-04		11	NA	NA	11
Sediment Total				2E-04	NA	NA	2E-04		11	NA	NA	11
Receptor Total				2E-04	NA	NA	2E-04		11	NA	NA	11

NA - Not applicable/not available

GI = Gastrointestinal

NOE = No Observed Effect

Total Blood HI Across Media =	0.1
Total Reproduction HI Across Media =	**5**
Total GI System HI Across Media =	0.3
Total Kidney HI Across Media =	0.4
Total Liver HI Across Media =	0.01
Total Nervous System HI Across Media =	4E-04
Total Body Weight HI Across Media =	0.4
Total Skin HI Across Media =	0.02
Total NOE HI Across Media =	4E-04
Total Kidney HI Across Media =	0.4
Total Eyes HI Across Media =	**5**
Total Finger Nails HI Across Media =	**5**

Table 4-2-6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water/Sediment	Crab (Lagoon)	Surface Water/Sediment Crab (Lagoon)	Cadmium	NA	NA	NA	NA	Kidney	0.6	NA	NA	0.6
			Chromium	NA	NA	NA	NA	NOE	5.7E-04	NA	NA	5.7E-04
			Copper	NA	NA	NA	NA	GI system	0.4	NA	NA	0.4
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	NA	NA	NA	NA	Body Weight	0.5	NA	NA	0.5
			Silver	NA	NA	NA	NA	Skin	0.03	NA	NA	0.03
			Zinc	NA	NA	NA	NA	Blood	0.2	NA	NA	0.2
			4,4'-DDD	4E-06	NA	NA	4E-06	NA	NA	NA	NA	NA
			4,4'-DDE	9E-05	NA	NA	9E-05	NA	NA	NA	NA	NA
			4,4'-DDT	2E-07	NA	NA	2E-07	Liver	0.01	NA	NA	0.01
			Tetrachloroethene	5E-10	NA	NA	5E-10	Nervous System	4.6E-04	NA	NA	4.6E-04
			Dioxin-Like PCBs	5E-05	NA	NA	5E-05	Reproduction	6.2E+00	NA	NA	6
			Non Dioxin-Like PCBs	2E-05	NA	NA	2E-05	Finger nails, Eyes	6.8E+00	NA	NA	7
		Exposure Point Total		2E-04	NA	NA	2E-04		15	NA	NA	15
	Exposure Medium Total			2E-04	NA	NA	2E-04		15	NA	NA	15
Sediment Total				2E-04	NA	NA	2E-04		15	NA	NA	15
Receptor Total				2E-04	NA	NA	2E-04		15	NA	NA	15

NA - Not applicable/not available

GI = Gastrointestinal

NOE = No Observed Effect

Total Blood HI Across Media =	0.2
Total Reproduction HI Across Media =	**6**
Total GI System HI Across Media =	0.4
Total Kidney HI Across Media =	0.6
Total Liver HI Across Media =	0.01
Total Nervous System HI Across Media =	5E-04
Total Body Weight HI Across Media =	0.5
Total Skin HI Across Media =	0.03
Total NOE HI Across Media =	6E-04
Total Kidney HI Across Media =	0.6
Total Eyes HI Across Media =	**7**
Total Finger Nails HI Across Media =	**7**

Table 5

Uncertainty Analysis - Use of Different Fish/Blue Crab Consumption Rates and Associated Risks

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Exposure Point	Chemical of Potential Concern	EPC (mg/kg-meal)	Exposure Frequency												Consumption Rates Corresponding to Acceptable Risk							
			2 meals/week						1 meal/month						Consumption Rate (meals/year)						Comments	
			Adult		Youth		Child		Adult		Youth		Child		Adult		Youth		Child			
			Cancer Risk	Hazard Quotient	Cancer Risk	Hazard Quotient	Cancer Risk	Hazard Quotient	Cancer Risk	Hazard Quotient	Cancer Risk	Hazard Quotient	Cancer Risk	Hazard Quotient	Cancer Effects	Non-cancer Effects	Cancer Effects	Non-cancer Effects	Cancer Effects	Non-cancer Effects	Cancer Effects	Non-cancer Effects
Fish	Dioxin-Like PCBs	2.0E-05	8.1E-04	26	6.1E-04	47	4.7E-04	61	9.3E-05	3	7.0E-05	5	5.5E-05	7	13	4	17	2	22	2	approximately 1-2 meals per month	approximately 2-4 meals per year
	Non Dioxin-Like PCBs	6.6E-01	4.2E-04	31	3.1E-04	55	2.5E-04	72	4.9E-05	4	3.6E-05	6	2.8E-05	8	25	3	33	2	42	1	approximately 2-3 meals per month	approximately 1-3 meals per year
Blue Crab	Dioxin-Like PCBs	2.0E-06	8.3E-05	3	6.2E-05	5	4.9E-05	6	9.6E-06	0.3	7.2E-06	0.6	5.6E-06	0.7	125	39	167	22	213	17	approximately 2-4 meals per week	approximately 1-3 meals per month
	Non Dioxin-Like PCBs	6.2E-02	4.0E-05	3	3.0E-05	5	2.3E-05	7	4.6E-06	0.3	3.4E-06	0.6	2.7E-06	0.8	263	36	352	20	449	15	approximately 5-9 meals per week	approximately 1-3 meals per month

Note:

Acceptable risk levels are an excess lifetime cancer risk of $1x10^{-4}$ and hazard quotient of 1.0 for each PCB entry.

Attachment E-4
Selection of BSAF Values for Organic and Inorganic Chemicals

Table 1
Selection of 4,4-DDD Whole Body BSAF Values
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Superfund Site	Organism Common Name	Fresh or Saltwater Species	Commonly Consumed (Yes or No)	Biota Tissue Supplemental	BSAF
Naval Education & Training Center, Old Fire Fighting Training Area	cunner	Saltwater	Yes	single or multiple organisms	0.255

Average	0.255

Notes:

BSAF values presented are whole-body values. Biota age class was not reported.
BSAF = biota-sediment accumulation factor

Table 2
Selection of 4,4-DDE Whole Body BSAF Values
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Superfund Site	Organism Common Name	Fresh or Saltwater Species	Commonly Consumed (Yes or No)	Biota Tissue Supplemental	BSAF
Calcasieu Estuary	spot	Saltwater	Yes	single or multiple organisms	0.111
Naval Education & Training Center, Derecktor Shipyard	cunner	Saltwater	Yes	composite	8.43
Naval Education & Training Center, McAllister Point Landfill	cunner	Saltwater	Yes	composite	34.8

Average	14.4

Notes:

BSAF values presented are whole-body values. Biota age class was not reported.
BSAF = biota-sediment accumulation factor

Table 3
Selection of 4,4-DDT Whole Body BSAF Values
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Superfund Site	Organism Common Name	Fresh or Saltwater Species	Commonly Consumed (Yes or No)	Biota Tissue Supplemental	BSAF
Naval Education & Training Center, Old Fire Fighting Training Area	cunner	Saltwater	Yes	single or multiple organisms	0.232

Average	0.232

Notes:
BSAF values presented are whole-body values. Biota age class was not reported.
BSAF = biota-sediment accumulation factor

Table 4
Selection of Whole Body Metal BSAFs
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Species	Sediment Contamination	BSAF	Values Used		Comment/Summary
Cadmium	Carnivore	high	0.043			Cadmium BSAF derived using the average of three fish species based on medium sediment contamination
	Carnivore	medium	0.22	0.22	dry/dry	
	Carnivore	low	2			
	Herbivore	high	0.32			
	Herbivore	medium	0.11	0.11	dry/dry	
	Herbivore	low	2			
	Omnivore	high	0.15			
	Omnivore	medium	0.22	0.22	dry/dry	
	Omnivore	low	2			
		Average	--	0.18	dry/dry	
Chromium	Fish (perca flavescens)	--	0.043	0.043	dry/dry	Chromium BSAF selected is the only fish BSAF available.
Copper	Cancer Magister (Omnivore)	Yes	0.14	0.14	dry/dry	No fish BSAF values are available for copper. Copper BSAF selected based on one crustacean BSAF.

Note:
All values are acquired from WDE 1995 and are based on whole body values.
BSAF = biota-sediment accumulation factor

Reference:
Washington Department of Ecology (WDE). 1995. Bioaccumulation Factor Approach Analysis for Metals and Polar Organic Compounds. October 1995.

Attachment E-5
Lead Models

TABLE 11.1a (RAGS D ADULT LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Adult Recreational User/Trespasser/Site Visitor, Exposure to Sediment

1. Lead Screening Questions

Medium	Lead Concentration used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Sediment	234	mg/kg	Average Detected Value	400	mg/kg	Recommended Soil Screening Level

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model was used? Provide reference and version	EPA Adult Lead Model, Version date 06/21/2009
If the EPA Adult Lead Model (ALM) was not used provide rationale for model selected.	--
Where are the input values located in the risk assessment report?	Located in Attachment E-5, Table 11.1b
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Exposure point concentration was based on the arithmetic mean of lead concentrations in sediment (Attachment E-1, Table 3.3).
What was the point of exposure and location?	Sediment from the lagoon at SWMU 6.
Where are the output values located in the risk assessment report?	Attachment E-5, Table 11.1b
What GSD value was used? If this is outside the recommended range of 1.8-2.1), provide rationale in Appendix <Y>.	Default values were used: GSD = 1.8 from Analysis of NHANES 1999 – 2004 (USEPA, 2009); GSD = 2.1 from Analysis of NHANES III (1988 - 1994) (USEPA, 2002).
What baseline blood lead concentration (PbB0) value was used? If this is outside the default range of 1.7 to 2.2 provide rationale in Appendix <Y>	Default values were used: PbB0 = 1.0 ug/dL from Analysis of NHANES 1999 – 2004 (USEPA, 2009); PbB0 = 1.5 from Analysis of NHANES III (1988 - 1994) (USEPA, 2002).
Was the default exposure frequency (EF; 219 days/year) used?	No. A value of 104 days/year was used for the current/future recreational user/trespasser/site visitor scenario.
Was the default BKSF used (0.4 ug/dL per ug/day) used?	Yes
Was the default absorption fraction (AF; 0.12) used?	Yes
Was the default soil ingestion rate (IR; 50 mg/day) used?	A sediment IR value of 50 mg/day was used for the current/future recreational user/trespasser/site visitor scenario.
If non-default values were used for any of the parameters listed above, where are the rationale for the values located in the risk assessment report?	Site specific exposure values were used and are provided in Attachment E-1, Table 4.4.

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

TABLE 11.1a (RAGS D ADULT LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Adult Recreational User/Trespasser/Site Visitor, Exposure to Sediment

Medium	Result	Comment/PRG 1
Sediment	Input value of 234 mg/kg in sediment results in geometric mean blood lead levels of 1.2 and 1.7 ug/dL for women of child-bearing age based on GSDs of 1.8 and 2.1, respectively. These values do not exceed the target baseline blood lead concentration of 10 ug/dL. The 95th percentile fetal blood lead concentrations are 2.7 and 5.1 ug/dL. The probabilities that the fetal blood lead levels exceed 10 ug/dL are 0.006% and 0.52%. These values meet the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children (fetuses of exposed women) exceeding 10 ug/dL blood lead for the NHANES 1999-2004 and NHANES III (Phases 1&2).	n/a

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 11.1b
Calculations of Blood Lead Concentrations (PbBs) - Sediment
SWMU 6, Former NASD, Vieques, Puerto Rico

Exposure Medium: Sediment
Receptor: Recreational User/Trespasser/Site Visitor

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 1999-2004	GSDi and PbBo from Analysis of NHANES III (Phases 1&2)
PbS	Sediment lead concentration	ug/g or ppm	234	234
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	2.1
PbB_0	Baseline PbB	ug/dL	1.0	1.5
IR_S	Sediment ingestion rate	g/day	0.050	0.050
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--
K_{SD}	Mass fraction of soil in dust	--	--	--
$AF_{S, D}$	Absorption fraction (assumed same as for soil and dust)	--	0.12	0.12
$EF_{S, D}$	Exposure frequency	days/yr	104	104
$AT_{S, D}$	Averaging time	days/yr	365	365
PbB_{adult}	**PbB of adult recreational user/trespasser/site visitor, geometric mean**	**ug/dL**	**1.2**	**1.7**
$PbB_{fetal, 0.95}$	95th percentile PbB among fetuses of adult recreational user/trespasser/site visitor	ug/dL	2.7	5.1
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.0060%**	**0.52%**

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

TABLE 11.2a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Recreational User/Trespasser/Site Visitor, Exposure to Sediment

1. Lead Screening Questions

Medium	Lead Concentration Used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Sediment	234	mg/kg	Average Detected Value	400	mg/kg	Recommended Soil Screening Level
Water	4	ug/L	Default	15	ug/L	Recommended Drinking Water Action Level

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model (version and date) was used?	Lead Model for Windows, Version 1.1 Build 11 (February, 2010)
Where are the input values located in the risk assessment report?	Located in Attachment E-5, Table 11.2b
What range of media concentrations were used for the model?	Sediment concentrations of 11.8 - 612 mg/kg.
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Exposure point concentration was based on the arithmetic mean of lead concentrations in sediment (Attachment E-1, Table 3.3).
Was soil sample taken from top 2 cm? If not, why?	No.
Was soil sample sieved? What size screen was used? If not sieved, provide rationale.	No.
What was the point of exposure/location?	Sediment from the lagoon at SWMU 6.
Where are the output values located in the risk assessment report?	Located in Attachment E-5, Table 11.2b
Was the model run using default values only?	No; measured sediment concentrations were used.
Was the default soil bioavailability used?	Yes.
Was the default soil ingestion rate used?	Yes.
If non-default values were used, where are the rationale for the values located in the risk assessment report?	Site specific exposure values were used and are provided in Attachment E-1, Table 4.4.

TABLE 11.2a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Recreational User/Trespasser/Site Visitor, Exposure to Sediment

3. Final Result

Medium	Result	Comment/PRG 1
Sediment	Input value of 234 mg/kg in sediment and 4 ug/L in groundwater results in a geometric mean blood lead = 3.386 ug/dL and 1.061% of children above a blood lead level of 10 ug/dL. This value is less than the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children exceeding 10 ug/dL blood lead.	n/a

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 11.2b
Calculations of Blood Lead Concentrations (PbBs) - Sediment
SWMU 6, Former NASD, Vieques, Puerto Rico

LEAD MODEL FOR WINDOWS Version 1.1

==========

Model Version: 1.1 Build11
User Name: CH2M HILL
Date: 01/20/12
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Run Mode: Site Risk Assessment

Soil/Dust Data
Arithmetic mean - sediment (234 mg/lkg)

==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

Table 11.2b
Calculations of Blood Lead Concentrations (PbBs) - Sediment
SWMU 6, Former NASD, Vieques, Puerto Rico

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	234.000	0.000
1-2	234.000	0.000
2-3	234.000	0.000
3-4	234.000	0.000
4-5	234.000	0.000
5-6	234.000	0.000
6-7	234.000	0.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

Table 11.2b
Calculations of Blood Lead Concentrations (PbBs) - Sediment
SWMU 6, Former NASD, Vieques, Puerto Rico

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.044	0.000	0.370
1-2	0.034	0.894	0.000	0.912
2-3	0.062	0.983	0.000	0.960
3-4	0.067	0.952	0.000	0.990
4-5	0.067	0.930	0.000	1.049
5-6	0.093	0.985	0.000	1.115
6-7	0.093	1.071	0.000	1.139

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	5.513	6.947	3.8
1-2	8.643	10.483	4.3
2-3	8.749	10.754	4.0
3-4	8.847	10.855	3.8
4-5	6.694	8.740	3.1
5-6	6.072	8.266	2.6
6-7	5.759	8.063	2.3

TABLE 11.3a (RAGS D ADULT LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Adult Fish Consumers, Exposure to Fish

1. Lead Screening Questions

Medium	Lead Concentration used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Fish	0.519	mg/kg	Arithmetic mean fish tissue concentration	NA	mg/kg	NA

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model was used? Provide reference and version	EPA Adult Lead Model, Version date 06/21/2009
If the EPA Adult Lead Model (ALM) was not used provide rationale for model selected.	--
Where are the input values located in the risk assessment report?	Attachment E-5, Table 11.3b
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Arithmetic mean fish tissue concentration (Table 3.6 of Attachment E-1).
What was the point of exposure and location?	SWMU 6
Where are the output values located in the risk assessment report?	Attachment E-5, Table 11.3b
What GSD value was used? If this is outside the recommended range of 1.8-2.1), provide rationale in Appendix <Y>.	Recommended baseline GSD of 1.8 based on estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data was used.
What baseline blood lead concentration (PbB0) value was used? If this is outside the default range of 1.7 to 2.2 provide rationale in Appendix <Y>	Recommended baseline PbB0 of 1.0 (µg/dL) based on estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data was used.
Was the default exposure frequency (EF; 219 days/year) used?	No; an exposure frequency of 2 days/week (104 days/year) was used.
Was the default BKSF used (0.4 ug/dL per ug/day) used?	Yes
Was the default absorption fraction (AF; 0.12) used?	Yes
Was the default soil ingestion rate (IR; 50 mg/day) used?	No, a value of 227 g/day was used based on 8 oz/day of fish ingestion.
If non-default values were used for any of the parameters listed above, where are the rationale for the values located in the risk assessment report?	Section 4.4 of the HHRA report.

Medium	Result	Comment/PRG 1
Fish	Input value of 0.519 mg/kg in fish tissue results in 0.7% of fish consumers above a blood lead level of 10 ug/dL. The geometric mean blood lead level = 2.6 ug/dL. This meets the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children (fetuses of exposed women) exceeding 10 ug/dL blood lead.	n/a

Table 11.3b
Calculations of Blood Lead Concentrations (PbBs) - Fish
SWMU 6, Former NASD, Vieques, Puerto Rico

Medium: Surface Water/Sediment
Exposure Medium: Fish (Fish Consumer)

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 1999-2004[1]
PbF	Lead concentration in fish (average)	ug/g or ppm	0.519
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
$BKSF$	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_F	Fish ingestion rate (8 oz./day)	g/day	227
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--
K_{SD}	Mass fraction of soil in dust	--	--
AF	Absorption fraction (assumed same as soil and dust)	--	0.12
EF_F	Exposure frequency (2 days/week or 104 days/year)	days/yr	104
AT_F	Averaging time	days/yr	365
PbB_{adult}	**PbB of adult fish consumer, geometric mean**	**ug/dL**	**2.6**
$PbB_{fetal,\ 0.95}$	95th percentile PbB among fetuses of adult fish consumers	ug/dL	6.2
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.7%**

Equation 1, based on Eq. 1, 2 in USEPA (1996).[2]

PbB_{adult} =	$(PbF*BKSF*IR_F*AF*EF_F/AT_F) + PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Note:
[1] Recommended baseline blood lead concentration (µg/dL) and GSD estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data were used according to the EPA June 2009 Update.
[2] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}). When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

Source:
EPA. 2009. Update of the adult lead methodology's default baseline blood lead concentration and geometric standard deviation parameters. OSWER 9200.2-82. June 2009.

TABLE 11.4a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Fish Consumers, Exposure to Fish

1. Lead Screening Questions

Medium	Lead Concentration Used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Soil	0	mg/kg	N/A	400	mg/kg	Recommended Soil Screening Level
Water	0	ug/L	N/A	15	ug/L	Recommended Drinking Water Action Level
Ambient Air	0	ug/m^3	N/A	NA		
Fish	0.519	mg/kg	Modeled	NA		

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model (version and date) was used?	IEUBK win v1.1 build 11 (February, 2010)
Where are the input values located in the risk assessment report?	Located in Attachment E-5, Table 11.4b
What range of media concentrations were used for the model?	Located in Attachment E-5, Table 11.4b
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Arithmetic mean fish tissue concentration (Table 3.6 of Attachment E-1).
Was soil sample taken from top 2 cm? If not, why?	No.
Was soil sample sieved? What size screen was used? If not sieved, provide rationale.	No.
What was the point of exposure/location?	Fish caught in lagoon at SWMU 6.
Where are the output values located in the risk assessment report?	Located in Attachment E-5, Table 11.4b
Was the model run using default values only?	No; soil, ambient air, and groundwater concentrations were set at 0. The alternate dietary option assumes 10% of meat consumed by the receptor is locally harvested fish.
Was the default soil bioavailability used?	Yes.
Was the default soil ingestion rate used?	Yes.
If non-default values were used, where are the rationale for the values located in the risk assessment report?	Section 4.4 of the HHRA report.

TABLE 11.4a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Fish Consumers, Exposure to Fish

3. Final Result

Medium	Result	Comment/PRG 1
Fish	Input value of 0.519 mg/kg in fish results in 0.00% of children above a blood lead level of 10 ug/dL. The geometric mean blood lead level = 0.725 ug/dL. This meets the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children exceeding 10 ug/dL blood lead.	n/a

Table 11.4b
Calculations of Blood Lead Concentrations (PbBs) - Fish Consumption (10%)
SWMU 6, Former NASD, Vieques, Puerto Rico

LEAD MODEL FOR WINDOWS Version 1.1

==========
Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research
==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.000
1-2	2.000	3.000	32.000	0.000
2-3	3.000	5.000	32.000	0.000
3-4	4.000	5.000	32.000	0.000
4-5	4.000	5.000	32.000	0.000
5-6	4.000	7.000	32.000	0.000
6-7	4.000	7.000	32.000	0.000

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.807
1-2	3.486
2-3	4.095
3-4	4.147
4-5	4.200
5-6	4.484
6-7	5.027

Table 11.4b
Calculations of Blood Lead Concentrations (PbBs) - Fish Consumption (10%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Alternative Dietary Values
Home grown fruits concentration: 0.000 µg/g
Home grown vegetables concentration: 0.000 µg/g
Fish from fishing concentration: 0.519 µg/g
Game animals from hunting concentration: 0.000 µg/g
Home grown fruits factor: 0.000 % of all fruits
Home grown vegetables factor: 0.000 % of all vegetables
Fish from fishing factor: 10.000 %of all meat
Game animals from hunting factor: 0.000 % of all meat

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 0.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 0.000 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Table 11.4b
Calculations of Blood Lead Concentrations (PbBs) - Fish Consumption (10%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	0.000	0.000
1-2	0.000	0.000
2-3	0.000	0.000
3-4	0.000	0.000
4-5	0.000	0.000
5-6	0.000	0.000
6-7	0.000	0.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.000	1.382	0.000	0.000
1-2	0.000	1.717	0.000	0.000
2-3	0.000	2.017	0.000	0.000
3-4	0.000	2.047	0.000	0.000
4-5	0.000	2.077	0.000	0.000
5-6	0.000	2.218	0.000	0.000
6-7	0.000	2.486	0.000	0.000

Table 11.4b

Calculations of Blood Lead Concentrations (PbBs) - Fish Consumption (10%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	0.000	1.382	0.8
1-2	0.000	1.717	0.7
2-3	0.000	2.017	0.7
3-4	0.000	2.047	0.7
4-5	0.000	2.077	0.7
5-6	0.000	2.218	0.7
6-7	0.000	2.486	0.7

TABLE 11.5a (RAGS D ADULT LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Adult Blue Crab Consumers, Exposure to Blue Crab

1. Lead Screening Questions

Medium	Lead Concentration used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Blue Crab	3.23	mg/kg	Arithmetic mean blue crab tissue concentration	NA	mg/kg	NA

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model was used? Provide reference and version	EPA Adult Lead Model, Version date 06/21/2009
If the EPA Adult Lead Model (ALM) was not used provide rationale for model selected.	--
Where are the input values located in the risk assessment report?	Attachment E-5, Table 11.5b
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Arithmetic mean blue crab tissue concentration (Table 3.7 of Attachment E-1).
What was the point of exposure and location?	SWMU 6
Where are the output values located in the risk assessment report?	Attachment E-5, Table 11.5b
What GSD value was used? If this is outside the recommended range of 1.8-2.1), provide rationale in Appendix <Y>.	Recommended baseline GSD of 1.8 based on estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data was used.
What baseline blood lead concentration (PbB0) value was used? If this is outside the default range of 1.7 to 2.2 provide rationale in Appendix <Y>	Recommended baseline PbB0 of 1.0 (µg/dL) based on estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data was used.
Was the default exposure frequency (EF; 219 days/year) used?	No; an exposure frequency of 2 days/week (104 days/year) was used.
Was the default BKSF used (0.4 ug/dL per ug/day) used?	Yes
Was the default absorption fraction (AF; 0.12) used?	Yes
Was the default soil ingestion rate (IR; 50 mg/day) used?	No, a value of 227 g/day was used based on 8 oz/day of blue crab ingestion.
If non-default values were used for any of the parameters listed above, where are the rationale for the values located in the risk assessment report?	Section 4.4 of the HHRA report.

Medium	Result	Comment/PRG 1
Blue Crab	Input value of 3.23 mg/kg in blue crab tissue results in 49.4% of blue crab consumers above a blood lead level of 10 ug/dL. The geometric mean blood lead level = 11 ug/dL. This exceeds the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children (fetuses of exposed women) exceeding 10 ug/dL blood lead.	n/a

Table 11.5b
Calculations of Blood Lead Concentrations (PbBs) - Blue Crab
SWMU 6, Former NASD, Vieques, Puerto Rico

Medium: Surface Water/Sediment
Exposure Medium: Blue Crab (Blue Crab Consumer)

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 1999-2004[1]
PbF	Lead concentration in blue crab (average)	ug/g or ppm	3.23
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_F	Blue crab ingestion rate (8 oz./day)	g/day	227
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--
K_{SD}	Mass fraction of soil in dust	--	--
AF	Absorption fraction (assumed same as soil and dust)	--	0.12
EF_F	Exposure frequency (2 days/week or 104 days/year)	days/yr	104
AT_F	Averaging time	days/yr	365
PbB_{adult}	**PbB of adult blue crab consumer, geometric mean**	**ug/dL**	**11.0**
$PbB_{fetal, 0.95}$	95th percentile PbB among fetuses of adult blue crab consumers	ug/dL	26.1
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**49.4%**

Equation 1, based on Eq. 1, 2 in USEPA (1996).[2]

PbB_{adult} =	$(PbF*BKSF*IR_F*AF*EF_F/AT_F) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Note:
[1] Recommended baseline blood lead concentration (µg/dL) and GSD estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data were used according to the EPA June 2009 Update.
[2] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}). When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

Source:
EPA. 2009. Update of the adult lead methodology's default baseline blood lead concentration and geometric standard deviation parameters. OSWER 9200.2-82. June 2009.

TABLE 11.6a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Blue Crab Consumers, Exposure to Blue Crab

1. Lead Screening Questions

Medium	Lead Concentration Used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Soil	0	mg/kg	N/A	400	mg/kg	Recommended Soil Screening Level
Water	0	ug/L	N/A	15	ug/L	Recommended Drinking Water Action Level
Ambient Air	0	ug/m^3	N/A	NA		
Blue crab	3.23	mg/kg	Modeled	NA		

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model (version and date) was used?	IEUBK win v1.1 build 11 (February, 2010)
Where are the input values located in the risk assessment report?	Located in Attachment E-5, Table 11.6b
What range of media concentrations were used for the model?	Located in Attachment E-5, Table 11.6b
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Arithmetic mean blue crab tissue concentration (Table 3.7 of Attachment E-1).
Was soil sample taken from top 2 cm? If not, why?	No.
Was soil sample sieved? What size screen was used? If not sieved, provide rationale.	No.
What was the point of exposure/location?	blue crab caught in lagoon at SWMU 6.
Where are the output values located in the risk assessment report?	Located in Attachment E-5, Table 11.6b
Was the model run using default values only?	No; soil, ambient air, and groundwater concentrations were set at 0. The alternate dietary option assumes 10% of meat consumed by the receptor is locally harvested blue crab.
Was the default soil bioavailability used?	Yes.
Was the default soil ingestion rate used?	Yes.
If non-default values were used, where are the rationale for the values located in the risk assessment report?	Section 4.4 of the HHRA report.

TABLE 11.6a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Blue Crab Consumers, Exposure to Blue Crab

3. Final Result

Medium	Result	Comment/PRG 1
Blue crab	Input value of 3.23 mg/kg in blue crab results in 0.092% of children above a blood lead level of 10 ug/dL. The geometric mean blood lead level = 2.313 ug/dL. This meets the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children exceeding 10 ug/dL blood lead.	n/a

Table 11.6b
Calculations of Blood Lead Concentrations (PbBs) - Blue Crab Consumption (10%)
SWMU 6, Former NASD, Vieques, Puerto Rico

LEAD MODEL FOR WINDOWS Version 1.1

==========
Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research
==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.000
1-2	2.000	3.000	32.000	0.000
2-3	3.000	5.000	32.000	0.000
3-4	4.000	5.000	32.000	0.000
4-5	4.000	5.000	32.000	0.000
5-6	4.000	7.000	32.000	0.000
6-7	4.000	7.000	32.000	0.000

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	5.686
1-2	11.512
2-3	14.427
3-4	15.243
4-5	16.061
5-6	17.325
6-7	19.817

Table 11.6b
Calculations of Blood Lead Concentrations (PbBs) - Blue Crab Consumption (10%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Alternative Dietary Values
Home grown fruits concentration: 0.000 µg/g
Home grown vegetables concentration: 0.000 µg/g
Fish from fishing concentration: 3.230 µg/g
Game animals from hunting concentration: 0.000 µg/g
Home grown fruits factor: 0.000 % of all fruits
Home grown vegetables factor: 0.000 % of all vegetables
Fish from fishing factor: 10.000 %of all meat
Game animals from hunting factor: 0.000 % of all meat

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 0.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 0.000 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Table 11.6b
Calculations of Blood Lead Concentrations (PbBs) - Blue Crab Consumption (10%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	0.000	0.000
1-2	0.000	0.000
2-3	0.000	0.000
3-4	0.000	0.000
4-5	0.000	0.000
5-6	0.000	0.000
6-7	0.000	0.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.000	2.756	0.000	0.000
1-2	0.000	5.487	0.000	0.000
2-3	0.000	6.855	0.000	0.000
3-4	0.000	7.278	0.000	0.000
4-5	0.000	7.699	0.000	0.000
5-6	0.000	8.320	0.000	0.000
6-7	0.000	9.498	0.000	0.000

Table 11.6b

Calculations of Blood Lead Concentrations (PbBs) - Blue Crab Consumption (10%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	0.000	2.756	1.5
1-2	0.000	5.487	2.2
2-3	0.000	6.855	2.5
3-4	0.000	7.278	2.5
4-5	0.000	7.699	2.5
5-6	0.000	8.320	2.5
6-7	0.000	9.498	2.6

TABLE 11.7a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Fish Consumers, Exposure to Fish

1. Lead Screening Questions

Medium	Lead Concentration Used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Soil	0	mg/kg	N/A	400	mg/kg	Recommended Soil Screening Level
Water	0	ug/L	N/A	15	ug/L	Recommended Drinking Water Action Level
Ambient Air	0	ug/m^3	N/A	NA		
Fish	0.519	mg/kg	Modeled	NA		

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model (version and date) was used?	IEUBK win v1.1 build 11 (February, 2010)
Where are the input values located in the risk assessment report?	Located in Attachment E-5, Table 11.7b
What range of media concentrations were used for the model?	Located in Attachment E-5, Table 11.7b
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Arithmetic mean fish tissue concentration (Table 3.6 of Attachment E-1).
Was soil sample taken from top 2 cm? If not, why?	No.
Was soil sample sieved? What size screen was used? If not sieved, provide rationale.	No.
What was the point of exposure/location?	Fish caught in lagoon at SWMU 6.
Where are the output values located in the risk assessment report?	Located in Attachment E-5, Table 11.7b
Was the model run using default values only?	No; soil, ambient air, and groundwater concentrations were set at 0. The alternate dietary option assumes 25% of meat consumed by the receptor is locally harvested fish.
Was the default soil bioavailability used?	Yes.
Was the default soil ingestion rate used?	Yes.
If non-default values were used, where are the rationale for the values located in the risk assessment report?	Section 4.4 of the HHRA report.

TABLE 11.7a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Fish Consumers, Exposure to Fish

3. Final Result

Medium	Result	Comment/PRG 1
Fish	Input value of 0.519 mg/kg in fish results in 0.00% of children above a blood lead level of 10 ug/dL. The geometric mean blood lead level = 1.189 ug/dL. This meets the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children exceeding 10 ug/dL blood lead.	n/a

Table 11.7b
Calculations of Blood Lead Concentrations (PbBs) - Fish Consumption (25%)
SWMU 6, Former NASD, Vieques, Puerto Rico

LEAD MODEL FOR WINDOWS Version 1.1

==========
Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research
==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.000
1-2	2.000	3.000	32.000	0.000
2-3	3.000	5.000	32.000	0.000
3-4	4.000	5.000	32.000	0.000
4-5	4.000	5.000	32.000	0.000
5-6	4.000	7.000	32.000	0.000
6-7	4.000	7.000	32.000	0.000

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	3.627
1-2	5.771
2-3	7.036
3-4	7.306
4-5	7.577
5-6	8.139
6-7	9.237

Table 11.7b
Calculations of Blood Lead Concentrations (PbBs) - Fish Consumption (25%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Alternative Dietary Values
Home grown fruits concentration: 0.000 µg/g
Home grown vegetables concentration: 0.000 µg/g
Fish from fishing concentration: 0.519 µg/g
Game animals from hunting concentration: 0.000 µg/g
Home grown fruits factor: 0.000 % of all fruits
Home grown vegetables factor: 0.000 % of all vegetables
Fish from fishing factor: 25.000 %of all meat
Game animals from hunting factor: 0.000 % of all meat

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 0.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 0.000 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Table 11.7b
Calculations of Blood Lead Concentrations (PbBs) - Fish Consumption (25%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	0.000	0.000
1-2	0.000	0.000
2-3	0.000	0.000
3-4	0.000	0.000
4-5	0.000	0.000
5-6	0.000	0.000
6-7	0.000	0.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.000	1.777	0.000	0.000
1-2	0.000	2.816	0.000	0.000
2-3	0.000	3.430	0.000	0.000
3-4	0.000	3.571	0.000	0.000
4-5	0.000	3.713	0.000	0.000
5-6	0.000	3.992	0.000	0.000
6-7	0.000	4.527	0.000	0.000

Table 11.7b

Calculations of Blood Lead Concentrations (PbBs) - Fish Consumption (25%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	0.000	1.777	1.0
1-2	0.000	2.816	1.2
2-3	0.000	3.430	1.2
3-4	0.000	3.571	1.2
4-5	0.000	3.713	1.2
5-6	0.000	3.992	1.2
6-7	0.000	4.527	1.2

TABLE 11.8a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Blue Crab Consumers, Exposure to Blue Crab

1. Lead Screening Questions

Medium	Lead Concentration Used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Soil	0	mg/kg	N/A	400	mg/kg	Recommended Soil Screening Level
Water	0	ug/L	N/A	15	ug/L	Recommended Drinking Water Action Level
Ambient Air	0	ug/m^3	N/A	NA		
Blue crab	3.23	mg/kg	Modeled	NA		

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model (version and date) was used?	IEUBK win v1.1 build 11 (February, 2010)
Where are the input values located in the risk assessment report?	Located in Attachment E-5, Table 11.8b
What range of media concentrations were used for the model?	Located in Attachment E-5, Table 11.8b
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Arithmetic mean blue crab tissue concentration (Table 3.7 of Attachment E-1).
Was soil sample taken from top 2 cm? If not, why?	No.
Was soil sample sieved? What size screen was used? If not sieved, provide rationale.	No.
What was the point of exposure/location?	blue crab caught in lagoon at SWMU 6.
Where are the output values located in the risk assessment report?	Located in Attachment E-5, Table 11.6b
Was the model run using default values only?	No; soil, ambient air, and groundwater concentrations were set at 0. The alternate dietary option assumes 25% of meat consumed by the receptor is locally harvested blue crab.
Was the default soil bioavailability used?	Yes.
Was the default soil ingestion rate used?	Yes.
If non-default values were used, where are the rationale for the values located in the risk assessment report?	Section 4.4 of the HHRA report.

TABLE 11.8a (RAGS D IEUBK LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Child Blue Crab Consumers, Exposure to Blue Crab

3. Final Result

Medium	Result	Comment/PRG 1
Blue crab	Input value of 3.23 mg/kg in blue crab results in 6.426% of children above a blood lead level of 10 ug/dL. The geometric mean blood lead level = 4.895 ug/dL. This exceeds the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children exceeding 10 ug/dL blood lead.	n/a

Table 11.8b
Calculations of Blood Lead Concentrations (PbBs) - Blue Crab Consumption (25%)
SWMU 6, Former NASD, Vieques, Puerto Rico

LEAD MODEL FOR WINDOWS Version 1.1

==========
Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research
==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.000
1-2	2.000	3.000	32.000	0.000
2-3	3.000	5.000	32.000	0.000
3-4	4.000	5.000	32.000	0.000
4-5	4.000	5.000	32.000	0.000
5-6	4.000	7.000	32.000	0.000
6-7	4.000	7.000	32.000	0.000

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	10.825
1-2	25.836
2-3	32.866
3-4	35.046
4-5	37.228
5-6	40.243
6-7	46.214

Table 11.8b
Calculations of Blood Lead Concentrations (PbBs) - Blue Crab Consumption (25%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Alternative Dietary Values
Home grown fruits concentration: 0.000 µg/g
Home grown vegetables concentration: 0.000 µg/g
Fish from fishing concentration: 3.230 µg/g
Game animals from hunting concentration: 0.000 µg/g
Home grown fruits factor: 0.000 % of all fruits
Home grown vegetables factor: 0.000 % of all vegetables
Fish from fishing factor: 25.000 %of all meat
Game animals from hunting factor: 0.000 % of all meat

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 0.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 0.000 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Table 11.8b
Calculations of Blood Lead Concentrations (PbBs) - Blue Crab Consumption (25%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	0.000	0.000
1-2	0.000	0.000
2-3	0.000	0.000
3-4	0.000	0.000
4-5	0.000	0.000
5-6	0.000	0.000
6-7	0.000	0.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.000	5.107	0.000	0.000
1-2	0.000	11.654	0.000	0.000
2-3	0.000	14.711	0.000	0.000
3-4	0.000	15.830	0.000	0.000
4-5	0.000	16.947	0.000	0.000
5-6	0.000	18.385	0.000	0.000
6-7	0.000	21.018	0.000	0.000

Table 11.8b

Calculations of Blood Lead Concentrations (PbBs) - Blue Crab Consumption (25%)
SWMU 6, Former NASD, Vieques, Puerto Rico

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	0.000	5.107	2.8
1-2	0.000	11.654	4.6
2-3	0.000	14.711	5.2
3-4	0.000	15.830	5.4
4-5	0.000	16.947	5.5
5-6	0.000	18.385	5.5
6-7	0.000	21.018	5.6

TABLE 11.9a (RAGS D ADULT LEAD WORKSHEET)
Site Name: SWMU 6, Former NASD, Vieques, Puerto Rico
Receptor: Current/Future Adult Blue Crab Consumers, Exposure to Blue Crab

1. Lead Screening Questions

Medium	Lead Concentration used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Blue Crab	3.23	mg/kg	Arithmetic mean blue crab tissue concentration	NA	mg/kg	NA

2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model was used? Provide reference and version	EPA Adult Lead Model, Version date 06/21/2009
If the EPA Adult Lead Model (ALM) was not used provide rationale for model selected.	--
Where are the input values located in the risk assessment report?	Attachment E-5, Table 11.9b
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Arithmetic mean blue crab tissue concentration (Table 3.7 of Attachment E-1).
What was the point of exposure and location?	SWMU 6
Where are the output values located in the risk assessment report?	Attachment E-5, Table 11.9b
What GSD value was used? If this is outside the recommended range of 1.8-2.1), provide rationale in Appendix <Y>.	Recommended baseline GSD of 1.8 based on estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data was used.
What baseline blood lead concentration (PbB0) value was used? If this is outside the default range of 1.7 to 2.2 provide rationale in Appendix <Y>	Recommended baseline PbB0 of 1.0 (µg/dL) based on estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data was used.
Was the default exposure frequency (EF; 219 days/year) used?	No; an exposure frequency of 1 meal/month (12 meals/year) was used.
Was the default BKSF used (0.4 ug/dL per ug/day) used?	Yes
Was the default absorption fraction (AF; 0.12) used?	Yes
Was the default soil ingestion rate (IR; 50 mg/day) used?	No, a value of 227 g/day was used based on 8 oz/day of blue crab ingestion.
If non-default values were used for any of the parameters listed above, where are the rationale for the values located in the risk assessment report?	Section 5.6 of the HHRA report.

Medium	Result	Comment/PRG 1
Blue Crab	Input value of 3.23 mg/kg in blue crab tissue results in 0.3% of blue crab consumers above a blood lead level of 10 ug/dL. The geometric mean blood lead level = 2.2 ug/dL. This meets the blood lead goal as described in the 1994 OSWER Directive of no more than 5% of children (fetuses of exposed women) exceeding 10 ug/dL blood lead.	n/a

Table 11.9b
Calculations of Blood Lead Concentrations (PbBs) - Blue Crab
SWMU 6, Former NASD, Vieques, Puerto Rico

Medium: Surface Water/Sediment
Exposure Medium: Blue Crab (Blue Crab Consumer)

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 1999-2004[1]
PbF	Lead concentration in blue crab (average)	ug/g or ppm	3.23
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_F	Blue crab ingestion rate (8 oz./day)	g/day	227
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--
K_{SD}	Mass fraction of soil in dust	--	--
AF	Absorption fraction (assumed same as soil and dust)	--	0.12
EF_F	Exposure frequency (2 days/week or 104 days/year)	days/yr	12
AT_F	Averaging time	days/yr	365
PbB_{adult}	**PbB of adult blue crab consumer, geometric mean**	**ug/dL**	**2.2**
$PbB_{fetal, 0.95}$	95th percentile PbB among fetuses of adult blue crab consumers	ug/dL	5.1
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.3%**

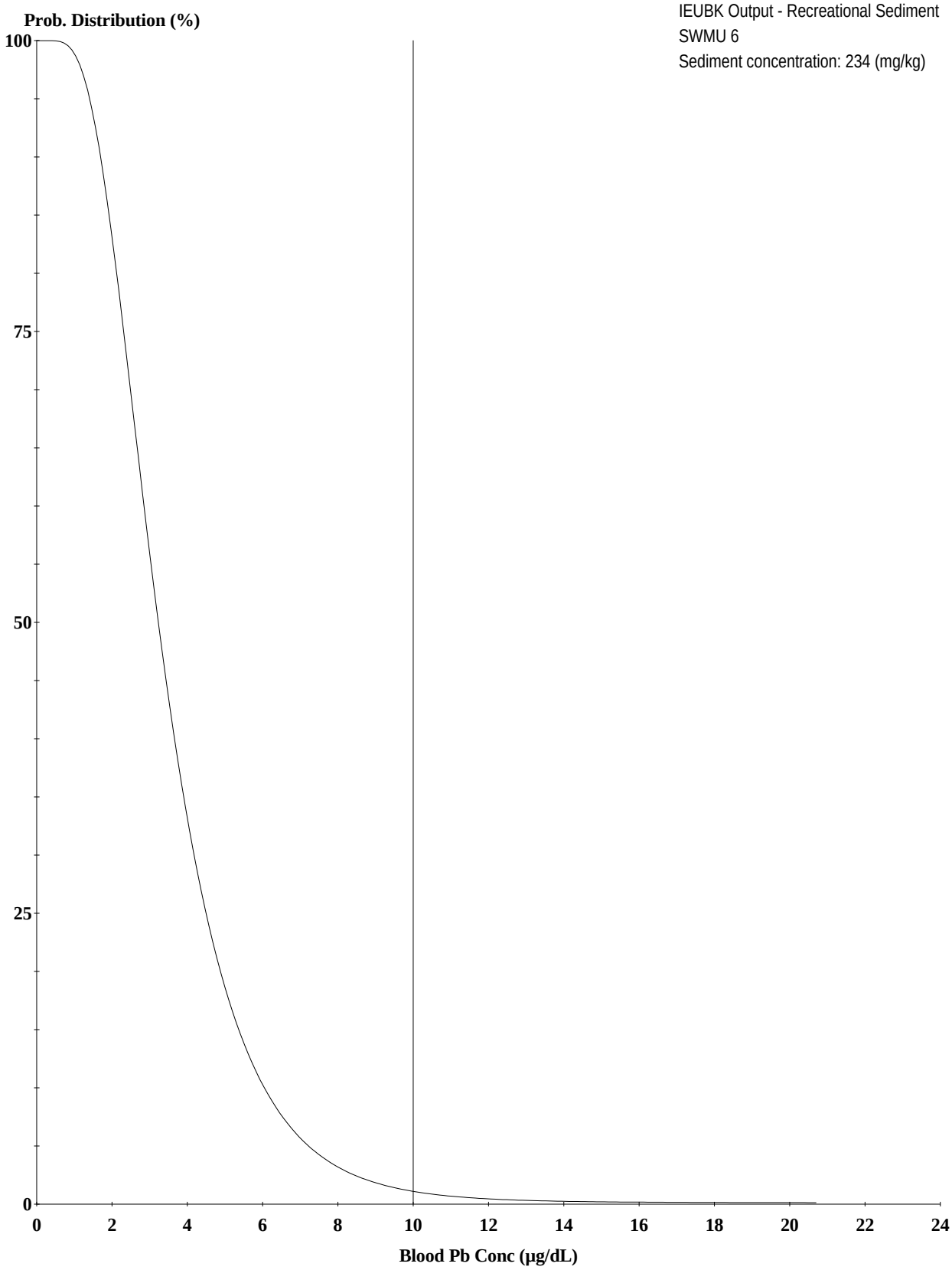
Equation 1, based on Eq. 1, 2 in USEPA (1996).[2]

PbB_{adult} =	$(PbF*BKSF*IR_F*AF*EF_F/AT_F) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Note:
[1] Recommended baseline blood lead concentration (µg/dL) and GSD estimates of U.S. women, 17–45 years of age, between NHANES III and 1999–2004 NHANES data were used according to the EPA June 2009 Update.
[2] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}). When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

Source:
EPA. 2009. Update of the adult lead methodology's default baseline blood lead concentration and geometric standard deviation parameters. OSWER 9200.2-82. June 2009.

Attachment E-5
IEUBK Output - Recreational Sediment
SWMU 6
Sediment concentration: 234 (mg/kg)

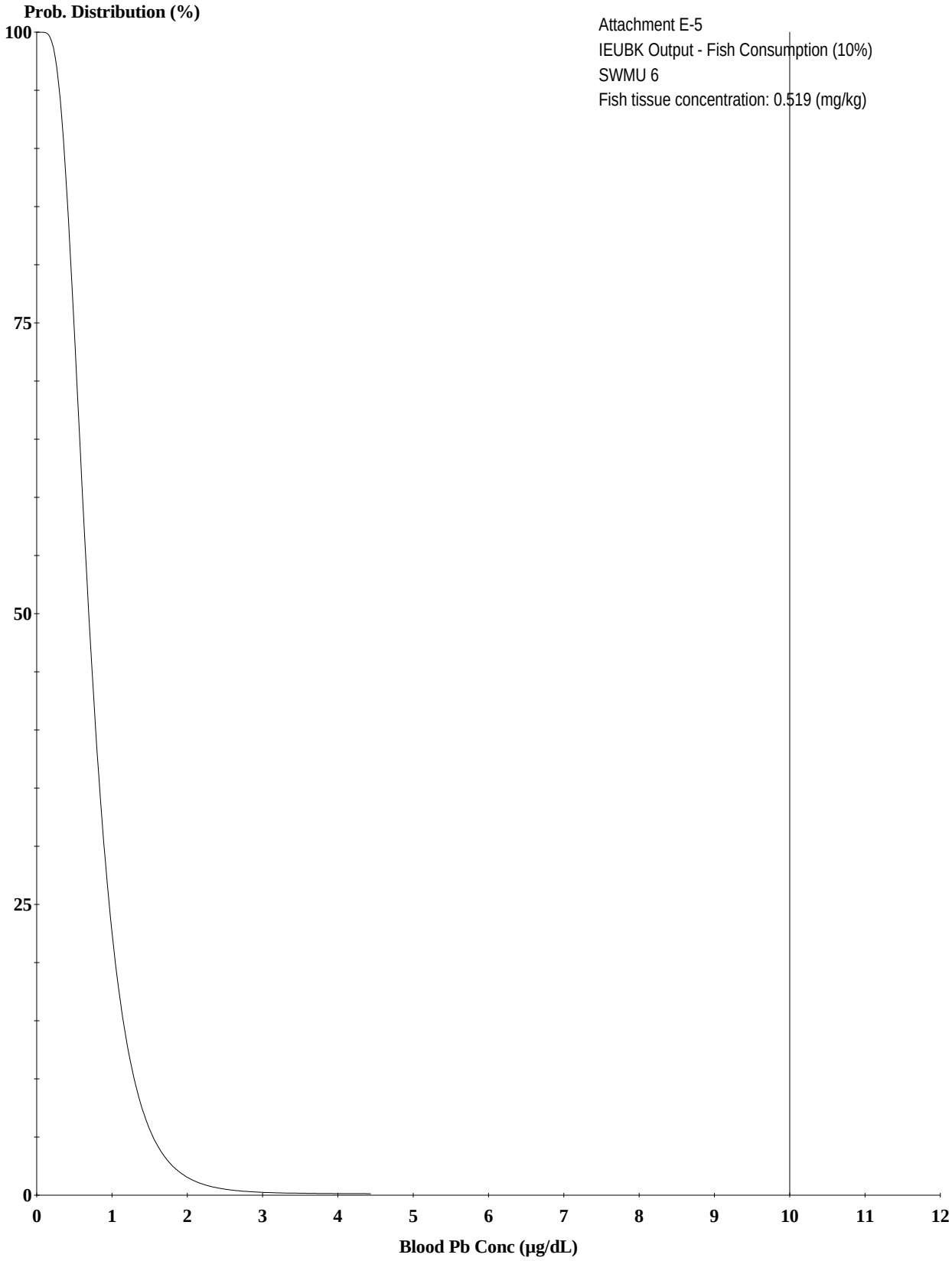


Cutoff = 10.000 µg/dl
Geo Mean = 3.386
GSD = 1.600
% Above = 1.061

Age Range = 0 to 84 months

Run Mode = Research

Attachment E-5
IEUBK Output - Fish Consumption (10%)
SWMU 6
Fish tissue concentration: 0.519 (mg/kg)

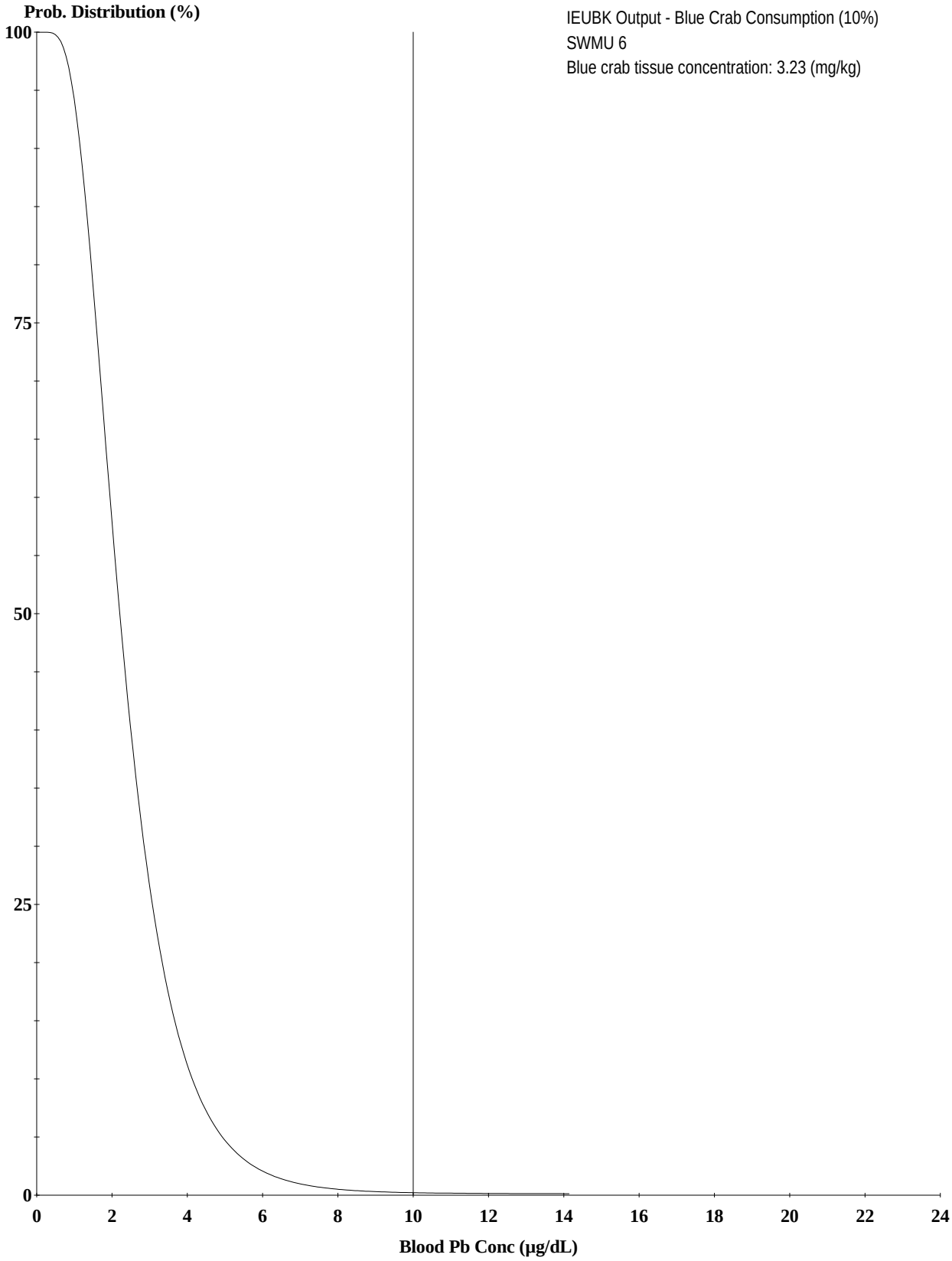


Cutoff = 10.000 µg/dl
Geo Mean = 0.725
GSD = 1.600
% Above = 0.000

Age Range = 0 to 84 months

Run Mode = Research

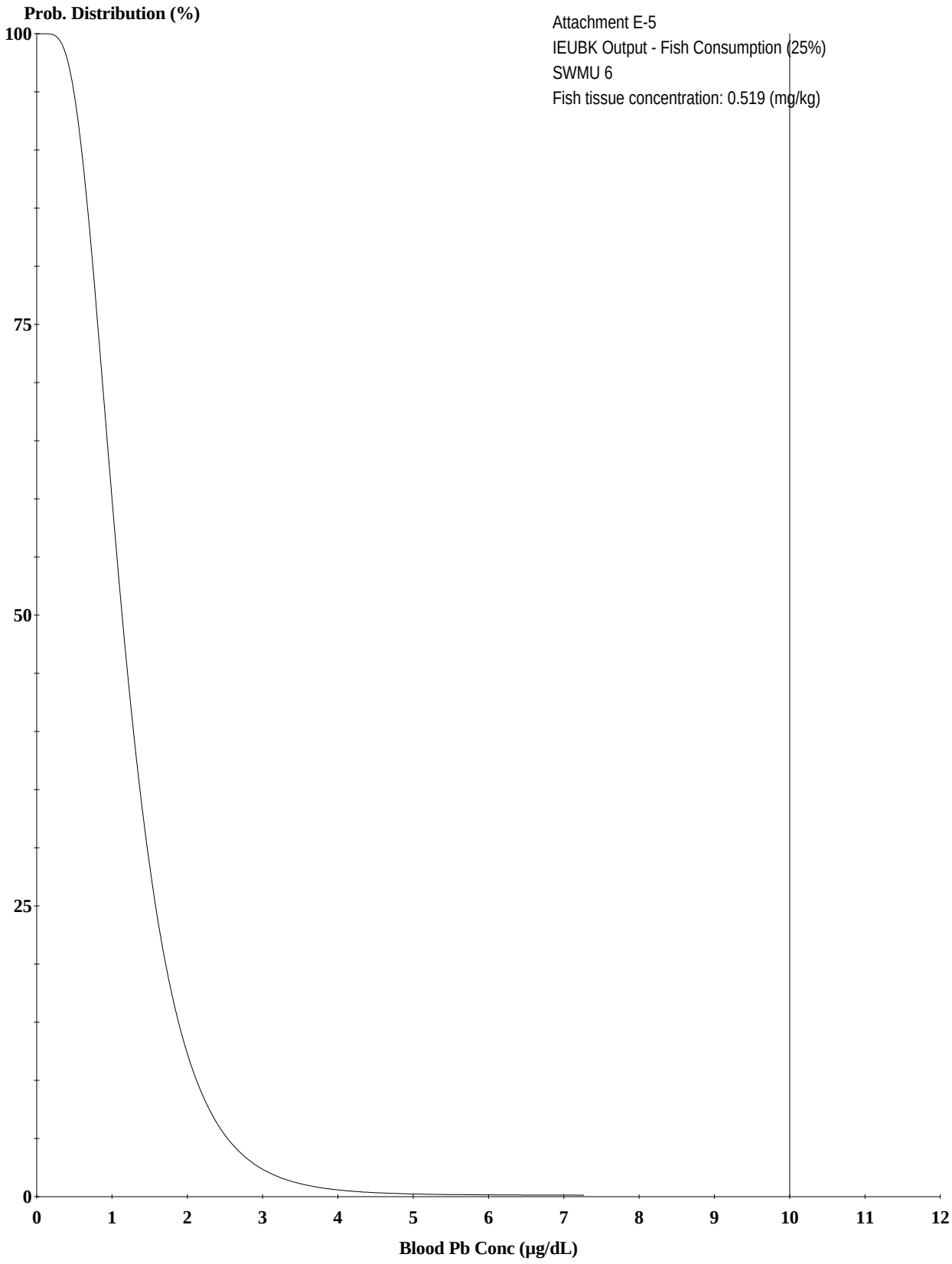
Attachment E-5
IEUBK Output - Blue Crab Consumption (10%)
SWMU 6
Blue crab tissue concentration: 3.23 (mg/kg)



Cutoff = 10.000 µg/dl
Geo Mean = 2.313
GSD = 1.600
% Above = 0.092

Age Range = 0 to 84 months

Run Mode = Research



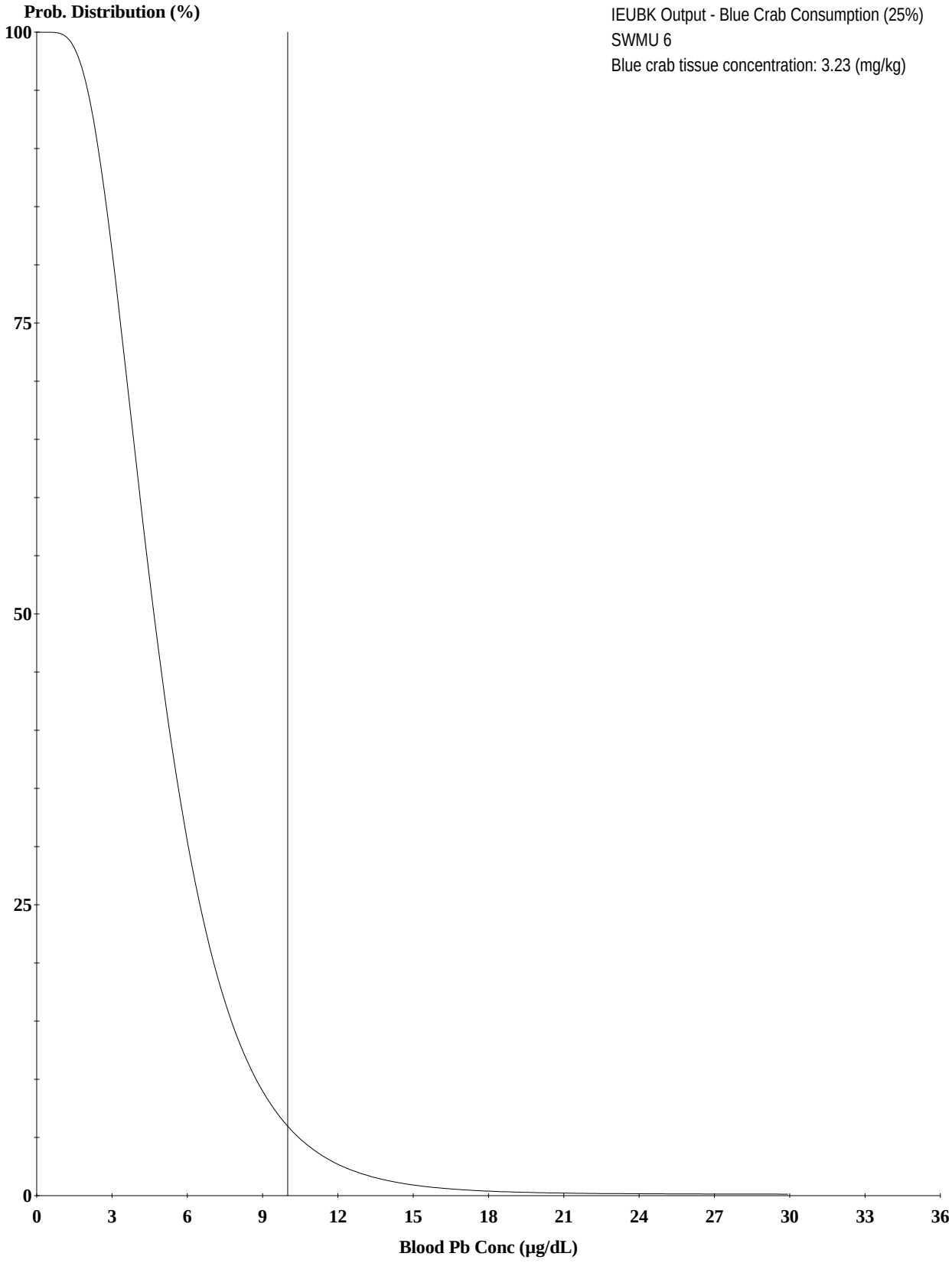
Attachment E-5
IEUBK Output - Fish Consumption (25%)
SWMU 6
Fish tissue concentration: 0.519 (mg/kg)

Cutoff = 10.000 µg/dl
Geo Mean = 1.189
GSD = 1.600
% Above = 0.000

Age Range = 0 to 84 months

Run Mode = Research

Attachment E-5
IEUBK Output - Blue Crab Consumption (25%)
SWMU 6
Blue crab tissue concentration: 3.23 (mg/kg)



Cutoff = 10.000 µg/dl
Geo Mean = 4.895
GSD = 1.600
% Above = 6.426

Age Range = 0 to 84 months

Run Mode = Research

Attachment E-6
Fish/Crab Risk Estimates For 1 Meal/Month

Table 7.1.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Fish	Ingestion[1]	Cadmium	2.6E-01	mg/kg-fish	9.4E-06	mg/kg-day	NA	NA	NA	2.7E-05	mg/kg-day	1.0E-03	mg/kg-day	2.7E-02
				Chromium	4.0E-01	mg/kg-fish	1.5E-05	mg/kg-day	NA	NA	NA	4.2E-05	mg/kg-day	1.5E+00	mg/kg-day	2.8E-05
				Copper	7.1E+00	mg/kg-fish	2.6E-04	mg/kg-day	NA	NA	NA	7.6E-04	mg/kg-day	4.0E-02	mg/kg-day	1.9E-02
				Lead	5.2E-01	mg/kg-fish	1.9E-05	mg/kg-day	NA	NA	NA	5.5E-05	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.7E-04	mg/kg-day	NA	NA	NA	5.1E-04	mg/kg-day	2.0E-02	mg/kg-day	2.5E-02
				Silver	7.4E-02	mg/kg-fish	2.7E-06	mg/kg-day	NA	NA	NA	7.9E-06	mg/kg-day	5.0E-03	mg/kg-day	1.6E-03
				Zinc	1.7E+01	mg/kg-fish	6.2E-04	mg/kg-day	NA	NA	NA	1.8E-03	mg/kg-day	3.0E-01	mg/kg-day	6.0E-03
				4,4'-DDD	8.9E-03	mg/kg-fish	3.3E-07	mg/kg-day	2.4E-01	1/(mg/kg-day)	7.9E-08	9.5E-07	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	3.0E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.0E-05	8.6E-05	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	1.6E-08	mg/kg-day	3.4E-01	1/(mg/kg-day)	5.5E-09	4.7E-08	mg/kg-day	5.0E-04	mg/kg-day	9.4E-05
				Tetrachloroethene	1.7E-03	mg/kg-fish	6.1E-08	mg/kg-day	2.1E-03	1/(mg/kg-day)	1.3E-10	1.8E-07	mg/kg-day	6.0E-03	mg/kg-day	3.0E-05
				Dioxin-Like PCBs	2.0E-05	mg/kg-fish	7.2E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	9.3E-05	2.1E-09	mg/kg-day	7.0E-10	mg/kg-day	3.0E+00
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	2.4E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	4.9E-05	7.1E-05	mg/kg-day	2.0E-05	mg/kg-day	3.5E+00
			Exp. Route Total								1.5E-04					6.6E+00
		Exposure Point Total									1.5E-04					6.6E+00
	Exposure Medium Total										1.5E-04					6.6E+00
Sediment Total											1.5E-04					6.6E+00
Receptor Total											1.5E-04					6.6E+00

NA = Not applicable.
[1] An exposure frequency of 1 meal per month was used in the risk and hazard calculations.

Table 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Fish	Ingestion[1]	Cadmium	2.6E-01	mg/kg-fish	7.0E-06	mg/kg-day	NA	NA	NA	4.9E-05	mg/kg-day	1.0E-03	mg/kg-day	4.9E-02
				Chromium	4.0E-01	mg/kg-fish	1.1E-05	mg/kg-day	NA	NA	NA	7.6E-05	mg/kg-day	1.5E+00	mg/kg-day	5.1E-05
				Copper	7.1E+00	mg/kg-fish	2.0E-04	mg/kg-day	NA	NA	NA	1.4E-03	mg/kg-day	4.0E-02	mg/kg-day	3.4E-02
				Lead	5.2E-01	mg/kg-fish	1.4E-05	mg/kg-day	NA	NA	NA	9.9E-05	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.3E-04	mg/kg-day	NA	NA	NA	9.1E-04	mg/kg-day	2.0E-02	mg/kg-day	4.6E-02
				Silver	7.4E-02	mg/kg-fish	2.0E-06	mg/kg-day	NA	NA	NA	1.4E-05	mg/kg-day	5.0E-03	mg/kg-day	2.8E-03
				Zinc	1.7E+01	mg/kg-fish	4.6E-04	mg/kg-day	NA	NA	NA	3.2E-03	mg/kg-day	3.0E-01	mg/kg-day	1.1E-02
				4,4'-DDD	8.9E-03	mg/kg-fish	2.4E-07	mg/kg-day	2.4E-01	1/(mg/kg-day)	5.9E-08	1.7E-06	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	2.2E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	7.5E-06	1.5E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	1.2E-08	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.1E-09	8.5E-08	mg/kg-day	5.0E-04	mg/kg-day	1.7E-04
				Tetrachloroethene	1.7E-03	mg/kg-fish	4.6E-08	mg/kg-day	2.1E-03	1/(mg/kg-day)	9.6E-11	3.2E-07	mg/kg-day	6.0E-03	mg/kg-day	5.3E-05
				Dioxin-Like PCBs	2.0E-05	mg/kg-fish	5.4E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	7.0E-05	3.8E-09	mg/kg-day	7.0E-10	mg/kg-day	5.4E+00
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	1.8E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	3.6E-05	1.3E-04	mg/kg-day	2.0E-05	mg/kg-day	6.4E+00
			Exp. Route Total								1.1E-04					1.2E+01
		Exposure Point Total									1.1E-04					1.2E+01
	Exposure Medium Total										1.1E-04					1.2E+01
Sediment Total											1.1E-04					1.2E+01
Receptor Total											1.1E-04					1.2E+01

NA = Not applicable.
[1] An exposure frequency of 1 meal per month was used in the risk and hazard calculations.

Table 7.3.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Fish (Lagoon)	Fish	Ingestion[1]	Cadmium	2.6E-01	mg/kg-fish	5.5E-06	mg/kg-day	NA	NA	NA	6.4E-05	mg/kg-day	1.0E-03	mg/kg-day	6.4E-02
				Chromium	4.0E-01	mg/kg-fish	8.5E-06	mg/kg-day	NA	NA	NA	9.9E-05	mg/kg-day	1.5E+00	mg/kg-day	6.6E-05
				Copper	7.1E+00	mg/kg-fish	1.5E-04	mg/kg-day	NA	NA	NA	1.8E-03	mg/kg-day	4.0E-02	mg/kg-day	4.5E-02
				Lead	5.2E-01	mg/kg-fish	1.1E-05	mg/kg-day	NA	NA	NA	1.3E-04	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.0E-04	mg/kg-day	NA	NA	NA	1.2E-03	mg/kg-day	2.0E-02	mg/kg-day	6.0E-02
				Silver	7.4E-02	mg/kg-fish	1.6E-06	mg/kg-day	NA	NA	NA	1.8E-05	mg/kg-day	5.0E-03	mg/kg-day	3.7E-03
				Zinc	1.7E+01	mg/kg-fish	3.6E-04	mg/kg-day	NA	NA	NA	4.2E-03	mg/kg-day	3.0E-01	mg/kg-day	1.4E-02
				4,4'-DDD	8.9E-03	mg/kg-fish	1.9E-07	mg/kg-day	2.4E-01	1/(mg/kg-day)	4.6E-08	2.2E-06	mg/kg-day	NA	NA	NA
				4,4'-DDE	8.1E-01	mg/kg-fish	1.7E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	5.9E-06	2.0E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	4.4E-04	mg/kg-fish	9.5E-09	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.2E-09	1.1E-07	mg/kg-day	5.0E-04	mg/kg-day	2.2E-04
				Tetrachloroethene	1.7E-03	mg/kg-fish	3.6E-08	mg/kg-day	2.1E-03	1/(mg/kg-day)	7.5E-11	4.2E-07	mg/kg-day	6.0E-03	mg/kg-day	6.9E-05
				Dioxin-Like PCBs	2.0E-05	mg/kg-fish	4.2E-10	mg/kg-day	1.3E+05	1/(mg/kg-day)	5.5E-05	4.9E-09	mg/kg-day	7.0E-10	mg/kg-day	7.0E+00
				Non Dioxin-Like PCBs	6.6E-01	mg/kg-fish	1.4E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	2.8E-05	1.7E-04	mg/kg-day	2.0E-05	mg/kg-day	8.3E+00
			Exp. Route Total								8.9E-05					1.6E+01
		Exposure Point Total									8.9E-05					1.6E+01
	Exposure Medium Total										8.9E-05					1.6E+01
Sediment Total											8.9E-05					1.6E+01
Receptor Total											8.9E-05					1.6E+01

NA = Not applicable.
[1] An exposure frequency of 1 meal per month was used in the risk and hazard calculations.

Table 7.4.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SWMU 6
Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Crab	Ingestion[1]	Cadmium	2.6E-01	mg/kg-fish	9.4E-06	mg/kg-day	NA	NA	NA	2.7E-05	mg/kg-day	1.0E-03	mg/kg-day	2.7E-02
				Chromium	4.0E-01	mg/kg-fish	1.5E-05	mg/kg-day	NA	NA	NA	4.2E-05	mg/kg-day	1.5E+00	mg/kg-day	2.8E-05
				Copper	7.1E+00	mg/kg-fish	2.6E-04	mg/kg-day	NA	NA	NA	7.6E-04	mg/kg-day	4.0E-02	mg/kg-day	1.9E-02
				Lead	3.2E+00	mg/kg-fish	1.2E-04	mg/kg-day	NA	NA	NA	3.4E-04	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.7E-04	mg/kg-day	NA	NA	NA	5.1E-04	mg/kg-day	2.0E-02	mg/kg-day	2.5E-02
				Silver	7.4E-02	mg/kg-fish	2.7E-06	mg/kg-day	NA	NA	NA	7.9E-06	mg/kg-day	5.0E-03	mg/kg-day	1.6E-03
				Zinc	2.7E+01	mg/kg-fish	9.7E-04	mg/kg-day	NA	NA	NA	2.8E-03	mg/kg-day	3.0E-01	mg/kg-day	9.5E-03
				4,4'-DDD	8.0E-02	mg/kg-fish	2.9E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	7.0E-07	8.5E-06	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	5.0E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.7E-05	1.5E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	1.2E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.0E-08	3.4E-07	mg/kg-day	5.0E-04	mg/kg-day	6.8E-04
				Tetrachloroethene	1.3E-03	mg/kg-fish	4.6E-08	mg/kg-day	2.1E-03	1/(mg/kg-day)	9.7E-11	1.4E-07	mg/kg-day	6.0E-03	mg/kg-day	2.3E-05
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	7.4E-11	mg/kg-day	1.3E+05	1/(mg/kg-day)	9.6E-06	2.2E-10	mg/kg-day	7.0E-10	mg/kg-day	3.1E-01
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	2.3E-06	mg/kg-day	2.0E+00	1/(mg/kg-day)	4.6E-06	6.7E-06	mg/kg-day	2.0E-05	mg/kg-day	3.3E-01
			Exp. Route Total								3.2E-05					7.2E-01
		Exposure Point Total									3.2E-05					7.2E-01
	Exposure Medium Total										3.2E-05					7.2E-01
Sediment Total											3.2E-05					7.2E-01
Receptor Total											3.2E-05					7.2E-01

NA = Not applicable.
[1] An exposure frequency of 1 meal per month was used in the risk and hazard calculations.

Table 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Crab	Ingestion[1]	Cadmium	2.6E-01	mg/kg-fish	7.0E-06	mg/kg-day	NA	NA	NA	4.9E-05	mg/kg-day	1.0E-03	mg/kg-day	4.9E-02
				Chromium	4.0E-01	mg/kg-fish	1.1E-05	mg/kg-day	NA	NA	NA	7.6E-05	mg/kg-day	1.5E+00	mg/kg-day	5.1E-05
				Copper	7.1E+00	mg/kg-fish	2.0E-04	mg/kg-day	NA	NA	NA	1.4E-03	mg/kg-day	4.0E-02	mg/kg-day	3.4E-02
				Lead	3.2E+00	mg/kg-fish	8.8E-05	mg/kg-day	NA	NA	NA	6.2E-04	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.3E-04	mg/kg-day	NA	NA	NA	9.1E-04	mg/kg-day	2.0E-02	mg/kg-day	4.6E-02
				Silver	7.4E-02	mg/kg-fish	2.0E-06	mg/kg-day	NA	NA	NA	1.4E-05	mg/kg-day	5.0E-03	mg/kg-day	2.8E-03
				Zinc	2.7E+01	mg/kg-fish	7.3E-04	mg/kg-day	NA	NA	NA	5.1E-03	mg/kg-day	3.0E-01	mg/kg-day	1.7E-02
				4,4'-DDD	8.0E-02	mg/kg-fish	2.2E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	5.3E-07	1.5E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	3.7E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.3E-05	2.6E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	8.7E-08	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.0E-08	6.1E-07	mg/kg-day	5.0E-04	mg/kg-day	1.2E-03
				Tetrachloroethene	1.3E-03	mg/kg-fish	3.5E-08	mg/kg-day	2.1E-03	1/(mg/kg-day)	7.3E-11	2.4E-07	mg/kg-day	6.0E-03	mg/kg-day	4.0E-05
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	5.5E-11	mg/kg-day	1.3E+05	1/(mg/kg-day)	7.2E-06	3.9E-10	mg/kg-day	7.0E-10	mg/kg-day	5.5E-01
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	1.7E-06	mg/kg-day	2.0E+00	1/(mg/kg-day)	3.4E-06	1.2E-05	mg/kg-day	2.0E-05	mg/kg-day	6.0E-01
			Exp. Route Total								2.4E-05					1.3E+00
		Exposure Point Total									2.4E-05					1.3E+00
	Exposure Medium Total										2.4E-05					1.3E+00
Sediment Total											2.4E-05					1.3E+00
Receptor Total											2.4E-05					1.3E+00

NA = Not applicable.

[1] An exposure frequency of 1 meal per month was used in the risk and hazard calculations.

Table 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

SWMU 6

Former NASD, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Crab Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water/Sediment	Crab (Lagoon)	Crab	Ingestion[1]	Cadmium	2.6E-01	mg/kg-fish	5.5E-06	mg/kg-day	NA	NA	NA	6.4E-05	mg/kg-day	1.0E-03	mg/kg-day	6.4E-02
				Chromium	4.0E-01	mg/kg-fish	8.5E-06	mg/kg-day	NA	NA	NA	9.9E-05	mg/kg-day	1.5E+00	mg/kg-day	6.6E-05
				Copper	7.1E+00	mg/kg-fish	1.5E-04	mg/kg-day	NA	NA	NA	1.8E-03	mg/kg-day	4.0E-02	mg/kg-day	4.5E-02
				Lead	3.2E+00	mg/kg-fish	6.9E-05	mg/kg-day	NA	NA	NA	8.1E-04	mg/kg-day	NA	NA	NA
				Nickel	4.8E+00	mg/kg-fish	1.0E-04	mg/kg-day	NA	NA	NA	1.2E-03	mg/kg-day	2.0E-02	mg/kg-day	6.0E-02
				Silver	7.4E-02	mg/kg-fish	1.6E-06	mg/kg-day	NA	NA	NA	1.8E-05	mg/kg-day	5.0E-03	mg/kg-day	3.7E-03
				Zinc	2.7E+01	mg/kg-fish	5.7E-04	mg/kg-day	NA	NA	NA	6.6E-03	mg/kg-day	3.0E-01	mg/kg-day	2.2E-02
				4,4'-DDD	8.0E-02	mg/kg-fish	1.7E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	4.1E-07	2.0E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.4E+00	mg/kg-fish	2.9E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	9.9E-06	3.4E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	3.2E-03	mg/kg-fish	6.8E-08	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.3E-08	8.0E-07	mg/kg-day	5.0E-04	mg/kg-day	1.6E-03
				Tetrachloroethene	1.3E-03	mg/kg-fish	2.7E-08	mg/kg-day	2.1E-03	1/(mg/kg-day)	5.7E-11	3.2E-07	mg/kg-day	6.0E-03	mg/kg-day	5.3E-05
				Dioxin-Like PCBs	2.0E-06	mg/kg-fish	4.3E-11	mg/kg-day	1.3E+05	1/(mg/kg-day)	5.6E-06	5.1E-10	mg/kg-day	7.0E-10	mg/kg-day	7.2E-01
				Non Dioxin-Like PCBs	6.2E-02	mg/kg-fish	1.3E-06	mg/kg-day	2.0E+00	1/(mg/kg-day)	2.7E-06	1.6E-05	mg/kg-day	2.0E-05	mg/kg-day	7.8E-01
			Exp. Route Total								1.9E-05					1.7E+00
		Exposure Point Total									1.9E-05					1.7E+00
	Exposure Medium Total										1.9E-05					1.7E+00
Sediment Total											1.9E-05					1.7E+00
Receptor Total											1.9E-05					1.7E+00

NA = Not applicable.

[1] An exposure frequency of 1 meal per month was used in the risk and hazard calculations.

Attachment E-7
Chemicals 100% Non-Detected in a Matrix

Attachment E-7

Screening of Non-Detects: Surface Soil

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

CAS	Chemical	Units	Min Result	Max Result	Res RSL [1]	Res RSL Basis	Ind RSL [1]	Ind RSL Basis	Max DL > Res RSL	Max DL > Ind RSL
71-55-6	1,1,1-Trichloroethane	mg/kg	0.0006	0.00067	640	csat	640	csat	No	No
79-34-5	1,1,2,2-Tetrachloroethane	mg/kg	0.0011	0.0012	0.56	ca	2.8	ca	No	No
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	mg/kg	0.0012	0.0013	910	csat	910	csat	No	No
79-00-5	1,1,2-Trichloroethane	mg/kg	0.0015	0.0017	0.16	nc	0.68	nc	No	No
75-34-3	1,1-Dichloroethane	mg/kg	0.00063	0.00071	3.3	ca	17	ca	No	No
75-35-4	1,1-Dichloroethene	mg/kg	0.00063	0.00071	24	nc	110	nc	No	No
87-61-6	1,2,3-Trichlorobenzene	mg/kg	0.0011	0.0013	4.9	nc	49	nc	No	No
120-82-1	1,2,4-Trichlorobenzene	mg/kg	0.0012	0.0013	6.2	nc	27	nc	No	No
96-12-8	1,2-Dibromo-3-chloropropane	mg/kg	0.0046	0.0052	0.0054	ca	0.069	ca	No	No
106-93-4	1,2-Dibromoethane	mg/kg	0.0015	0.0017	0.034	ca	0.17	ca	No	No
95-50-1	1,2-Dichlorobenzene	mg/kg	0.001	0.0012	190	nc	376	csat	No	No
107-06-2	1,2-Dichloroethane	mg/kg	0.0019	0.0021	0.43	ca	2.2	ca	No	No
78-87-5	1,2-Dichloropropane	mg/kg	0.0012	0.0013	0.94	ca	4.7	ca	No	No
99-35-4	1,3,5-Trinitrobenzene	mg/kg	0.14	0.16	220	nc	2700	nc	No	No
541-73-1	1,3-Dichlorobenzene	mg/kg	0.00084	0.00094	2.4	ca	12	ca	No	No
99-65-0	1,3-Dinitrobenzene	mg/kg	0.14	0.16	0.61	nc	6.2	nc	No	No
106-46-7	1,4-Dichlorobenzene	mg/kg	0.0012	0.0014	2.4	ca	12	ca	No	No
90-12-0	1-Methylnaphthalene	mg/kg	0.0026	0.38	16	ca	53	ca	No	No
108-60-1	2,2'-Oxybis(1-chloropropane)	mg/kg	0.19	0.24	4.6	ca	22	ca	No	No
95-95-4	2,4,5-Trichlorophenol	mg/kg	0.19	0.24	610	nc	6200	nc	No	No
88-06-2	2,4,6-Trichlorophenol	mg/kg	0.19	0.24	6.1	nc	62	nc	No	No
118-96-7	2,4,6-Trinitrotoluene	mg/kg	0.14	0.16	3.6	nc	42	nc	No	No
120-83-2	2,4-Dichlorophenol	mg/kg	0.19	0.24	18	nc	180	nc	No	No
105-67-9	2,4-Dimethylphenol	mg/kg	0.19	0.24	120	nc	1200	nc	No	No
51-28-5	2,4-Dinitrophenol	mg/kg	0.93	1.2	12	nc	120	nc	No	No
121-14-2	2,4-Dinitrotoluene	mg/kg	0.14	0.16	1.6	ca	5.5	ca	No	No
606-20-2	2,6-Dinitrotoluene	mg/kg	0.14	0.16	6.1	nc	62	nc	No	No
35572-78-2	2-Amino-4,6-dinitrotoluene	mg/kg	0.14	0.16	15	nc	200	nc	No	No
78-93-3	2-Butanone	mg/kg	0.0026	0.0029	2800	nc	20000	nc	No	No
91-58-7	2-Chloronaphthalene	mg/kg	0.19	0.24	175	csat	175	csat	No	No
95-57-8	2-Chlorophenol	mg/kg	0.19	0.24	39	nc	510	nc	No	No
591-78-6	2-Hexanone	mg/kg	0.0024	0.0027	21	nc	140	nc	No	No
91-57-6	2-Methylnaphthalene	mg/kg	0.0026	0.24	23	nc	220	nc	No	No
95-48-7	2-Methylphenol	mg/kg	0.19	0.24	310	nc	3100	nc	No	No
88-74-4	2-Nitroaniline	mg/kg	0.37	0.48	61	nc	600	nc	No	No
88-75-5	2-Nitrophenol	mg/kg	0.19	0.24	4.8	ca	24	ca	No	No
88-72-2	2-Nitrotoluene	mg/kg	0.14	0.16	2.9	ca	13	ca	No	No
m&pCRESOL	3- and 4-Methylphenol	mg/kg	0.19	0.24	610	nc	6200	nc	No	No
91-94-1	3,3'-Dichlorobenzidine	mg/kg	0.37	0.48	1.1	ca	3.8	ca	No	No
99-09-2	3-Nitroaniline	mg/kg	0.37	0.48	24	nc	86	ca	No	No
99-08-1	3-Nitrotoluene	mg/kg	0.14	0.16	0.61	nc	6.2	nc	No	No
534-52-1	4,6-Dinitro-2-methylphenol	mg/kg	0.37	0.48	0.49	nc	4.9	nc	No	No
19406-51-0	4-Amino-2,6-dinitrotoluene	mg/kg	0.14	0.16	15	nc	190	nc	No	No
101-55-3	4-Bromophenyl-phenylether	mg/kg	0.19	0.24	4.6	ca	22	ca	No	No
59-50-7	4-Chloro-3-methylphenol	mg/kg	0.19	0.24	610	nc	6200	nc	No	No
106-47-8	4-Chloroaniline	mg/kg	0.19	0.24	2.4	ca	8.6	ca	No	No
7005-72-3	4-Chlorophenyl-phenylether	mg/kg	0.19	0.24	4.6	ca	22	ca	No	No
108-10-1	4-Methyl-2-pentanone	mg/kg	0.003	0.0033	530	nc	3360	csat	No	No
100-01-6	4-Nitroaniline	mg/kg	0.37	0.48	24	nc	86	ca	No	No
100-02-7	4-Nitrophenol	mg/kg	0.93	1.2	4.8	ca	24	ca	No	No
99-99-0	4-Nitrotoluene	mg/kg	0.14	0.16	24	nc	110	ca	No	No
83-32-9	Acenaphthene	mg/kg	0.0026	0.24	340	nc	3300	nc	No	No
208-96-8	Acenaphthylene	mg/kg	0.0026	0.24	340	nc	3300	nc	No	No
309-00-2	Aldrin	mg/kg	0.00026	0.039	0.029	ca	0.1	ca	**Yes**	No
319-84-6	alpha-BHC	mg/kg	0.0013	0.039	0.077	ca	0.27	ca	No	No
5103-71-9	alpha-Chlordane	mg/kg	0.00027	0.039	1.6	ca	6.5	ca	No	No
120-12-7	Anthracene	mg/kg	0.0026	0.24	1700	nc	17000	nc	No	No
12674-11-2	Aroclor-1016	mg/kg	0.018	0.026	0.39	nc	3.7	nc	No	No
11104-28-2	Aroclor-1221	mg/kg	0.017	0.024	0.14	ca	0.54	ca	No	No
11141-16-5	Aroclor-1232	mg/kg	0.018	0.03	0.14	ca	0.54	ca	No	No
53469-21-9	Aroclor-1242	mg/kg	0.016	0.024	0.22	ca	0.74	ca	No	No
12672-29-6	Aroclor-1248	mg/kg	0.016	0.024	0.22	ca	0.74	ca	No	No
11096-82-5	Aroclor-1260	mg/kg	0.0088	0.024	0.22	ca	0.74	ca	No	No
71-43-2	Benzene	mg/kg	0.00093	0.001	1.1	ca	5.4	ca	No	No
65-85-0	Benzoic acid	mg/kg	0.93	1.2	24000	nc	250000	nc	No	No

Attachment E-7

Screening of Non-Detects: Surface Soil

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

CAS	Chemical	Units	Min Result	Max Result	Res RSL [1]	Res RSL Basis	Ind RSL [1]	Ind RSL Basis	Max DL > Res RSL	Max DL > Ind RSL
100-51-6	Benzyl alcohol	mg/kg	0.19	0.24	610	nc	6200	nc	No	No
319-85-7	beta-BHC	mg/kg	0.00026	0.039	0.27	ca	0.96	ca	No	No
111-91-1	bis(2-Chloroethoxy)methane	mg/kg	0.19	0.24	18	nc	180	nc	No	No
111-44-4	bis(2-Chloroethyl)ether	mg/kg	0.19	0.24	0.21	ca	1	ca	**Yes**	No
117-81-7	bis(2-Ethylhexyl)phthalate	mg/kg	0.37	0.48	35	ca	120	ca	No	No
74-97-5	Bromochloromethane	mg/kg	0.0017	0.0019	16	nc	68	nc	No	No
75-27-4	Bromodichloromethane	mg/kg	0.0006	0.00067	0.27	ca	1.4	ca	No	No
75-25-2	Bromoform	mg/kg	0.00086	0.00096	62	ca	220	ca	No	No
74-83-9	Bromomethane	mg/kg	0.0019	0.0021	0.73	nc	3.2	nc	No	No
85-68-7	Butylbenzylphthalate	mg/kg	0.37	0.48	260	ca	910	ca	No	No
86-74-8	Carbazole	mg/kg	0.19	0.24	NA	--	NA	--	No	No
75-15-0	Carbon disulfide	mg/kg	0.0019	0.0021	82	nc	370	nc	No	No
56-23-5	Carbon tetrachloride	mg/kg	0.0011	0.0012	0.61	ca	3	ca	No	No
108-90-7	Chlorobenzene	mg/kg	0.00065	0.00073	29	nc	140	nc	No	No
75-00-3	Chloroethane	mg/kg	0.0014	0.0015	1500	nc	2120	csat	No	No
67-66-3	Chloroform	mg/kg	0.001	0.0011	0.29	ca	1.5	ca	No	No
74-87-3	Chloromethane	mg/kg	0.00071	0.00079	12	nc	50	nc	No	No
156-59-2	cis-1,2-Dichloroethene	mg/kg	0.0012	0.0013	16	nc	200	nc	No	No
10061-01-5	cis-1,3-Dichloropropene	mg/kg	0.00078	0.00088	1.7	ca	8.3	ca	No	No
57-12-5	Cyanide	mg/kg	0.13	0.15	4.7	nc	61	nc	No	No
110-82-7	Cyclohexane	mg/kg	0.0019	0.0021	117	csat	117	csat	No	No
319-86-8	delta-BHC	mg/kg	0.00048	0.039	0.27	ca	0.96	ca	No	No
53-70-3	Dibenz(a,h)anthracene	mg/kg	0.0033	0.038	0.015	ca	0.21	ca	**Yes**	No
132-64-9	Dibenzofuran	mg/kg	0.19	0.24	7.8	nc	100	nc	No	No
124-48-1	Dibromochloromethane	mg/kg	0.00086	0.00096	0.68	ca	3.3	ca	No	No
75-71-8	Dichlorodifluoromethane (Freon-12)	mg/kg	0.0011	0.0012	9.4	nc	40	nc	No	No
60-57-1	Dieldrin	mg/kg	0.00027	0.039	0.03	ca	0.11	ca	**Yes**	No
84-66-2	Diethylphthalate	mg/kg	0.37	0.48	4900	nc	49000	nc	No	No
131-11-3	Dimethyl phthalate	mg/kg	0.37	0.48	610	nc	6200	nc	No	No
84-74-2	Di-n-butylphthalate	mg/kg	0.37	0.48	610	nc	6200	nc	No	No
117-84-0	Di-n-octylphthalate	mg/kg	0.37	0.48	35	ca	120	ca	No	No
959-98-8	Endosulfan I	mg/kg	0.00037	0.039	37	nc	370	nc	No	No
33213-65-9	Endosulfan II	mg/kg	0.00049	0.039	37	nc	370	nc	No	No
1031-07-8	Endosulfan sulfate	mg/kg	0.00034	0.078	37	nc	370	nc	No	No
72-20-8	Endrin	mg/kg	0.00044	0.078	1.8	nc	18	nc	No	No
7421-93-4	Endrin aldehyde	mg/kg	0.00061	0.078	1.8	nc	18	nc	No	No
53494-70-5	Endrin ketone	mg/kg	0.00036	0.078	1.8	nc	18	nc	No	No
100-41-4	Ethylbenzene	mg/kg	0.0013	0.0014	5.4	ca	27	ca	No	No
86-73-7	Fluorene	mg/kg	0.0026	0.24	230	nc	2200	nc	No	No
58-89-9	gamma-BHC (Lindane)	mg/kg	0.00034	0.039	0.52	ca	2.1	ca	No	No
5103-74-2	gamma-Chlordane	mg/kg	0.00029	0.039	1.6	ca	6.5	ca	No	No
76-44-8	Heptachlor	mg/kg	0.00034	0.039	0.11	ca	0.38	ca	No	No
1024-57-3	Heptachlor epoxide	mg/kg	0.00026	0.039	0.053	ca	0.19	ca	No	No
118-74-1	Hexachlorobenzene	mg/kg	0.19	0.24	0.3	ca	1.1	ca	No	No
87-68-3	Hexachlorobutadiene	mg/kg	0.19	0.24	6.1	nc	22	ca	No	No
77-47-4	Hexachlorocyclopentadiene	mg/kg	0.19	0.24	37	nc	370	nc	No	No
67-72-1	Hexachloroethane	mg/kg	0.19	0.24	4.3	nc	43	nc	No	No
2691-41-0	HMX	mg/kg	0.14	0.16	380	nc	4900	nc	No	No
78-59-1	Isophorone	mg/kg	0.19	0.24	510	ca	1800	ca	No	No
98-82-8	Isopropylbenzene	mg/kg	0.0011	0.0012	210	nc	268	csat	No	No
72-43-5	Methoxychlor	mg/kg	0.00046	0.078	31	nc	310	nc	No	No
79-20-9	Methyl acetate	mg/kg	0.0037	0.0042	7800	nc	29000	csat	No	No
108-87-2	Methylcyclohexane	mg/kg	0.0008	0.0009	117	csat	117	csat	No	No
75-09-2	Methylene chloride	mg/kg	0.0022	0.0025	36	nc	310	nc	No	No
1634-04-4	Methyl-tert-butyl ether (MTBE)	mg/kg	0.0008	0.0009	43	ca	220	ca	No	No
91-20-3	Naphthalene	mg/kg	0.0026	0.24	3.6	ca	18	ca	No	No
98-95-3	Nitrobenzene	mg/kg	0.14	0.16	4.8	ca	24	ca	No	No
621-64-7	n-Nitroso-di-n-propylamine	mg/kg	0.19	0.24	0.069	ca	0.25	ca	**Yes**	No
86-30-6	n-Nitrosodiphenylamine	mg/kg	0.19	0.24	99	ca	350	ca	No	No
87-86-5	Pentachlorophenol	mg/kg	0.93	1.2	0.89	ca	2.7	ca	**Yes**	No
108-95-2	Phenol	mg/kg	0.19	0.24	1800	nc	18000	nc	No	No
121-82-4	RDX	mg/kg	0.14	0.16	5.6	ca	24	ca	No	No
100-42-5	Styrene	mg/kg	0.00052	0.00058	630	nc	867	csat	No	No
479-45-8	Tetryl	mg/kg	0.14	0.16	24	nc	250	nc	No	No
7440-28-0	Thallium	mg/kg	3.5	22	0.078	nc	1	nc	**Yes**	**Yes**

Attachment E-7

Screening of Non-Detects: Surface Soil

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

CAS	Chemical	Units	Min Result	Max Result	Res RSL [1]	Res RSL Basis	Ind RSL [1]	Ind RSL Basis	Max DL > Res RSL	Max DL > Ind RSL
108-88-3	Toluene	mg/kg	0.00054	0.0006	500	nc	818	csat	No	No
8001-35-2	Toxaphene	mg/kg	0.042	1.9	0.44	ca	1.6	ca	**Yes**	**Yes**
156-60-5	trans-1,2-Dichloroethene	mg/kg	0.00072	0.00081	15	nc	69	nc	No	No
10061-02-6	trans-1,3-Dichloropropene	mg/kg	0.0019	0.0021	1.7	ca	8.3	ca	No	No
79-01-6	Trichloroethene	mg/kg	0.00082	0.00092	0.44	nc	2	nc	No	No
75-69-4	Trichlorofluoromethane (Freon-11)	mg/kg	0.00082	0.00092	79	nc	340	nc	No	No
75-01-4	Vinyl chloride	mg/kg	0.0011	0.0012	0.06	ca	1.7	ca	No	No
1330-20-7	Xylene, total	mg/kg	0.0013	0.0014	63	nc	258	csat	No	No

Notes:

Only analytes that were 100% non-detect in surface soil are included on this table.

[1] Regional Screening Levels for Residential Soil and Industrial Soil (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

The SL for Nitrobenzene was used as the SL for 4-Nitrophenol.
The SL for 1,3-Dichloropropene was used as the SL for cis-1,3-Dichloropropene.
The SL for 1,3-Dichloropropene was used as the SL for trans-1,3-Dichloropropene.
The SL for Bis(2-chloro-1-methylethyl) ether was used as the SL for 4-Bromophenyl phenyl ether
The SL for Endosulfan was used as the SL for Endosulfan sulfate.
The SL for Cyclohexane was used as the SL for Methylcyclohexane.
The SL for Bis(2-Ethylhexyl)phthalate was used as the SL for Di-n-octylphthalate
A SL was calculated for Dimethyl Phthalate using a PPRTV toxicity value.
The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for 'Hexachlorocyclohexane, Technical' was used as the SL for delta-BHC.
The SL for Endosulfan was used as the SL for Endosulfan II.
The SL for Chlordane was used as the SL for alpha-Chlordane.
The SL for Chlordane was used as the SL for gamma-Chlordane
The SL for Endrin was used as the SL for Endrin ketone.
The SL for 1,4-Dichlorobenzene was used as the SL for 1,3-Dichlorobenzene.
The SL for 'Cyanide (CN-)' was used as the SL for Cyanide.
SL for Bis(2-chloro-1-methylethyl) ether used was used as the SL for 4-Chlorophenyl-phenylether
The SL for Endrin was used as the SL for Endrin aldehyde.
No screening level is available for carbazole. The HEAST cancer slope factor has been withdrawn.
The SL for Nitrobenzene was used as the SL for 2-Nitrophenol.
The SL for Endosulfan was used as the SL for Endosulfan I.
The SL for 4-Nitroaniline was used as the SL for 3-Nitroaniline.
The SL for 'Cresol, p-' was used as the SL for 3&4-methylphenol.

ca = Carcinogenic
csat = Soil saturation limit
DL = Detection limit
mg/kg = Milligram per kilogram
nc = Noncarcinogenic
RSL = Regional Screening Level

Attachment E-7

Screening of Non-Detects: Sediment

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

CAS	Chemical	Units	Min Result	Max Result	Res RSL [1]	Res RSL Basis	Max DL > Res RSL
71-55-6	1,1,1-Trichloroethane	mg/kg	0.00091	0.0022	640	csat	No
79-34-5	1,1,2,2-Tetrachloroethane	mg/kg	0.0017	0.0041	0.56	ca	No
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	mg/kg	0.0018	0.0044	910	csat	No
79-00-5	1,1,2-Trichloroethane	mg/kg	0.0023	0.0057	0.16	nc	No
75-34-3	1,1-Dichloroethane	mg/kg	0.00096	0.0024	3.3	ca	No
75-35-4	1,1-Dichloroethene	mg/kg	0.00096	0.0024	24	nc	No
87-61-6	1,2,3-Trichlorobenzene	mg/kg	0.0017	0.0043	4.9	nc	No
120-82-1	1,2,4-Trichlorobenzene	mg/kg	0.0018	0.0044	6.2	nc	No
96-12-8	1,2-Dibromo-3-chloropropane	mg/kg	0.0071	0.0175	0.0054	ca	**Yes**
106-93-4	1,2-Dibromoethane	mg/kg	0.0023	0.0057	0.034	ca	No
95-50-1	1,2-Dichlorobenzene	mg/kg	0.0016	0.0039	190	nc	No
107-06-2	1,2-Dichloroethane	mg/kg	0.0028	0.007	0.43	ca	No
78-87-5	1,2-Dichloropropane	mg/kg	0.0018	0.0044	0.94	ca	No
541-73-1	1,3-Dichlorobenzene	mg/kg	0.0013	0.0032	2.4	ca	No
106-46-7	1,4-Dichlorobenzene	mg/kg	0.0018	0.0046	2.4	ca	No
90-12-0	1-Methylnaphthalene	mg/kg	0.0041	0.0331	16	ca	No
591-78-6	2-Hexanone	mg/kg	0.0037	0.0091	21	nc	No
91-57-6	2-Methylnaphthalene	mg/kg	0.0041	0.0331	23	nc	No
108-10-1	4-Methyl-2-pentanone	mg/kg	0.0045	0.0112	530	nc	No
309-00-2	Aldrin	mg/kg	0.00077	0.0015	0.029	ca	No
319-84-6	alpha-BHC	mg/kg	0.0039	0.0074	0.077	ca	No
5103-71-9	alpha-Chlordane	mg/kg	0.00082	0.0016	1.6	ca	No
12674-11-2	Aroclor-1016	mg/kg	0.033	0.064	0.39	nc	No
11104-28-2	Aroclor-1221	mg/kg	0.031	0.059	0.14	ca	No
11141-16-5	Aroclor-1232	mg/kg	0.039	0.074	0.14	ca	No
53469-21-9	Aroclor-1242	mg/kg	0.028	0.054	0.22	ca	No
12672-29-6	Aroclor-1248	mg/kg	0.028	0.054	0.22	ca	No
11096-82-5	Aroclor-1260	mg/kg	0.016	0.03	0.22	ca	No
71-43-2	Benzene	mg/kg	0.0014	0.0035	1.1	ca	No
7440-41-7	Beryllium	mg/kg	2.73	5.01	16	nc	No
319-85-7	beta-BHC	mg/kg	0.00077	0.0015	0.27	ca	No
74-97-5	Bromochloromethane	mg/kg	0.0026	0.0063	16	nc	No
75-27-4	Bromodichloromethane	mg/kg	0.00091	0.0022	0.27	ca	No
75-25-2	Bromoform	mg/kg	0.0013	0.0032	62	ca	No
74-83-9	Bromomethane	mg/kg	0.0028	0.007	0.73	nc	No
56-23-5	Carbon tetrachloride	mg/kg	0.0017	0.0042	0.61	ca	No
108-90-7	Chlorobenzene	mg/kg	0.00099	0.0024	29	nc	No
75-00-3	Chloroethane	mg/kg	0.0021	0.0052	1500	nc	No
67-66-3	Chloroform	mg/kg	0.0015	0.0038	0.29	ca	No
74-87-3	Chloromethane	mg/kg	0.0011	0.0027	12	nc	No
156-59-2	cis-1,2-Dichloroethene	mg/kg	0.0018	0.0043	16	nc	No
10061-01-5	cis-1,3-Dichloropropene	mg/kg	0.0012	0.0029	1.7	ca	No
110-82-7	Cyclohexane	mg/kg	0.0028	0.007	117	csat	No
319-86-8	delta-BHC	mg/kg	0.0014	0.0028	0.27	ca	No
53-70-3	Dibenz(a,h)anthracene	mg/kg	0.0051	0.0415	0.015	ca	**Yes**
124-48-1	Dibromochloromethane	mg/kg	0.0013	0.0032	0.68	ca	No
75-71-8	Dichlorodifluoromethane (Freon-12)	mg/kg	0.0017	0.0042	9.4	nc	No
60-57-1	Dieldrin	mg/kg	0.00082	0.0016	0.03	ca	No
959-98-8	Endosulfan I	mg/kg	0.0011	0.0022	37	nc	No
33213-65-9	Endosulfan II	mg/kg	0.0015	0.0028	37	nc	No
1031-07-8	Endosulfan sulfate	mg/kg	0.001	0.002	37	nc	No
72-20-8	Endrin	mg/kg	0.0013	0.0026	1.8	nc	No
7421-93-4	Endrin aldehyde	mg/kg	0.0018	0.0035	1.8	nc	No
53494-70-5	Endrin ketone	mg/kg	0.0011	0.0021	1.8	nc	No
100-41-4	Ethylbenzene	mg/kg	0.002	0.0048	5.4	ca	No
58-89-9	gamma-BHC (Lindane)	mg/kg	0.001	0.002	0.52	ca	No
5103-74-2	gamma-Chlordane	mg/kg	0.00088	0.0017	1.6	ca	No
76-44-8	Heptachlor	mg/kg	0.001	0.002	0.11	ca	No
1024-57-3	Heptachlor epoxide	mg/kg	0.00077	0.0015	0.053	ca	No
98-82-8	Isopropylbenzene	mg/kg	0.0017	0.0042	210	nc	No
72-43-5	Methoxychlor	mg/kg	0.0014	0.0027	31	nc	No
79-20-9	Methyl acetate	mg/kg	0.0057	0.014	7800	nc	No

Attachment E-7

Screening of Non-Detects: Sediment

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

CAS	Chemical	Units	Min Result	Max Result	Res RSL [1]	Res RSL Basis	Max DL > Res RSL
108-87-2	Methylcyclohexane	mg/kg	0.0012	0.003	117	csat	No
75-09-2	Methylene chloride	mg/kg	0.0034	0.0084	36	nc	No
1634-04-4	Methyl-tert-butyl ether (MTBE)	mg/kg	0.0012	0.003	43	ca	No
91-20-3	Naphthalene	mg/kg	0.0041	0.0331	3.6	ca	No
7782-49-2	Selenium	mg/kg	0.57	1.4	39	nc	No
100-42-5	Styrene	mg/kg	0.00079	0.002	630	nc	No
108-88-3	Toluene	mg/kg	0.00082	0.002	500	nc	No
8001-35-2	Toxaphene	mg/kg	0.13	0.25	0.44	ca	No
156-60-5	trans-1,2-Dichloroethene	mg/kg	0.0011	0.0027	15	nc	No
10061-02-6	trans-1,3-Dichloropropene	mg/kg	0.0028	0.007	1.7	ca	No
79-01-6	Trichloroethene	mg/kg	0.0012	0.0031	0.44	nc	No
75-69-4	Trichlorofluoromethane (Freon-11)	mg/kg	0.0012	0.0031	79	nc	No
75-01-4	Vinyl chloride	mg/kg	0.0017	0.0042	0.06	ca	No
1330-20-7	Xylene, total	mg/kg	0.0019	0.0048	63	nc	No

Notes:

Only analytes that were 100% non-detect in sediment are included on this table.

[1] Regional Screening Levels for Residential Soil (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

The SL for 1,3-Dichloropropene was used as the SL for cis-1,3-Dichloropropene.

The SL for 1,3-Dichloropropene was used as the SL for trans-1,3-Dichloropropene.

The SL for Endosulfan was used as the SL for Endosulfan sulfate.

The SL for Cyclohexane was used as the SL for Methylcyclohexane.

The SL for 'Hexachlorocyclohexane, Technical' was used as the SL for delta-BHC.

The SL for Endosulfan was used as the SL for Endosulfan II.

The SL for Chlordane was used as the SL for alpha-Chlordane.

The SL for Chlordane was used as the SL for gamma-Chlordane

The SL for Endrin was used as the SL for Endrin ketone.

The SL for 1,4-Dichlorobenzene was used as the SL for 1,3-Dichlorobenzene.

The SL for Endrin was used as the SL for Endrin aldehyde.

The SL for Endosulfan was used as the SL for Endosulfan I.

ca = Carcinogenic

csat = Soil saturation limit

DL = Detection limit

mg/kg = Milligram per kilogram

nc = Noncarcinogenic

RSL = Regional Screening Level

Attachment E-7

Screening of Non-Detects: Surface Water

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

CAS	Chemical	Units	Min Result	Max Result	Tapwater RSL [1]	Tapwater RSL Basis	Max DL > Tapwater RSL
71-55-6	1,1,1-Trichloroethane	ug/L	0.28	0.28	750	nc	No
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.26	0.26	0.066	ca	**Yes**
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	ug/L	0.46	0.46	5300	nc	No
79-00-5	1,1,2-Trichloroethane	ug/L	0.4	0.4	0.041	nc	**Yes**
75-34-3	1,1-Dichloroethane	ug/L	0.3	0.3	2.4	ca	No
75-35-4	1,1-Dichloroethene	ug/L	0.38	0.38	26	nc	No
87-61-6	1,2,3-Trichlorobenzene	ug/L	0.32	0.32	0.52	nc	No
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.22	0.22	0.39	nc	No
96-12-8	1,2-Dibromo-3-chloropropane	ug/L	2	2	0.00032	ca	**Yes**
106-93-4	1,2-Dibromoethane	ug/L	0.22	0.22	0.0065	ca	**Yes**
95-50-1	1,2-Dichlorobenzene	ug/L	0.5	0.5	28	nc	No
107-06-2	1,2-Dichloroethane	ug/L	0.3	0.3	0.15	ca	**Yes**
78-87-5	1,2-Dichloropropane	ug/L	0.3	0.3	0.38	ca	No
541-73-1	1,3-Dichlorobenzene	ug/L	0.3	0.3	0.42	ca	No
106-46-7	1,4-Dichlorobenzene	ug/L	0.3	0.3	0.42	ca	No
90-12-0	1-Methylnaphthalene	ug/L	0.041	0.042	0.97	ca	No
78-93-3	2-Butanone	ug/L	4	4	490	nc	No
591-78-6	2-Hexanone	ug/L	0.96	0.96	3.4	nc	No
91-57-6	2-Methylnaphthalene	ug/L	0.041	0.042	2.7	nc	No
72-54-8	4,4'-DDD	ug/L	0.0053	0.0054	0.28	ca	No
72-55-9	4,4'-DDE	ug/L	0.0078	0.0079	0.2	ca	No
50-29-3	4,4'-DDT	ug/L	0.0022	0.0023	0.2	ca	No
108-10-1	4-Methyl-2-pentanone	ug/L	2	2	100	nc	No
83-32-9	Acenaphthene	ug/L	0.041	0.042	40	nc	No
208-96-8	Acenaphthylene	ug/L	0.041	0.042	40	nc	No
67-64-1	Acetone	ug/L	2.6	3.6	1200	nc	No
309-00-2	Aldrin	ug/L	0.0033	0.0033	0.00021	ca	**Yes**
319-84-6	alpha-BHC	ug/L	0.0062	0.0062	0.0062	ca	No
5103-71-9	alpha-Chlordane	ug/L	0.0062	0.0062	0.027	ca	No
120-12-7	Anthracene	ug/L	0.041	0.042	130	nc	No
12674-11-2	Aroclor-1016	ug/L	0.02	0.021	0.11	nc	No
11104-28-2	Aroclor-1221	ug/L	0.02	0.021	0.0043	ca	**Yes**
11141-16-5	Aroclor-1232	ug/L	0.016	0.016	0.0043	ca	**Yes**
53469-21-9	Aroclor-1242	ug/L	0.02	0.021	0.034	ca	No
12672-29-6	Aroclor-1248	ug/L	0.011	0.011	0.034	ca	No
11097-69-1	Aroclor-1254	ug/L	0.0098	0.01	0.031	nc	No
11096-82-5	Aroclor-1260	ug/L	0.02	0.021	0.034	ca	No
7440-38-2	Arsenic	ug/L	25	132	0.045	ca	**Yes**
71-43-2	Benzene	ug/L	0.34	0.34	0.39	ca	No
56-55-3	Benzo(a)anthracene	ug/L	0.041	0.042	0.029	ca	**Yes**
50-32-8	Benzo(a)pyrene	ug/L	0.041	0.042	0.0029	ca	**Yes**
205-99-2	Benzo(b)fluoranthene	ug/L	0.041	0.042	0.029	ca	**Yes**
191-24-2	Benzo(g,h,i)perylene	ug/L	0.041	0.042	8.7	nc	No
207-08-9	Benzo(k)fluoranthene	ug/L	0.041	0.042	0.29	ca	No
7440-41-7	Beryllium	ug/L	4.8	4.8	1.6	nc	**Yes**
319-85-7	beta-BHC	ug/L	0.0025	0.0025	0.022	ca	No
74-97-5	Bromochloromethane	ug/L	0.34	0.34	8.3	nc	No
75-27-4	Bromodichloromethane	ug/L	0.3	0.3	0.12	ca	**Yes**
75-25-2	Bromoform	ug/L	0.38	0.38	7.9	ca	No
74-83-9	Bromomethane	ug/L	0.86	0.86	0.7	nc	**Yes**
75-15-0	Carbon disulfide	ug/L	0.38	0.38	72	nc	No
56-23-5	Carbon tetrachloride	ug/L	0.28	0.28	0.39	ca	No
108-90-7	Chlorobenzene	ug/L	0.32	0.32	7.2	nc	No
75-00-3	Chloroethane	ug/L	1	1	2100	nc	No

Attachment E-7

Screening of Non-Detects: Surface Water

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

CAS	Chemical	Units	Min Result	Max Result	Tapwater RSL [1]	Tapwater RSL Basis	Max DL > Tapwater RSL
67-66-3	Chloroform	ug/L	0.32	0.32	0.19	ca	**Yes**
74-87-3	Chloromethane	ug/L	0.64	0.64	19	nc	No
7440-47-3	Chromium	ug/L	17.2	17.2	1600	nc	No
218-01-9	Chrysene	ug/L	0.041	0.042	2.9	ca	No
156-59-2	cis-1,2-Dichloroethene	ug/L	0.38	0.38	2.8	nc	No
10061-01-5	cis-1,3-Dichloropropene	ug/L	0.24	0.24	0.41	ca	No
7440-48-4	Cobalt	ug/L	10	14.8	0.47	nc	**Yes**
7440-50-8	Copper	ug/L	25	108	62	nc	**Yes**
110-82-7	Cyclohexane	ug/L	0.4	0.4	1300	nc	No
319-86-8	delta-BHC	ug/L	0.0062	0.0062	0.022	ca	No
53-70-3	Dibenz(a,h)anthracene	ug/L	0.041	0.042	0.0029	ca	**Yes**
124-48-1	Dibromochloromethane	ug/L	0.26	0.26	0.15	ca	**Yes**
75-71-8	Dichlorodifluoromethane (Freon-12)	ug/L	0.34	0.34	19	nc	No
60-57-1	Dieldrin	ug/L	0.0055	0.0056	0.0015	ca	**Yes**
959-98-8	Endosulfan I	ug/L	0.0088	0.0089	7.8	nc	No
33213-65-9	Endosulfan II	ug/L	0.0033	0.0033	7.8	nc	No
1031-07-8	Endosulfan sulfate	ug/L	0.002	0.0021	7.8	nc	No
72-20-8	Endrin	ug/L	0.0037	0.0037	0.17	nc	No
7421-93-4	Endrin aldehyde	ug/L	0.0031	0.0031	0.17	nc	No
53494-70-5	Endrin ketone	ug/L	0.012	0.012	0.17	nc	No
100-41-4	Ethylbenzene	ug/L	0.44	0.44	1.3	ca	No
206-44-0	Fluoranthene	ug/L	0.041	0.042	63	nc	No
58-89-9	gamma-BHC (Lindane)	ug/L	0.0049	0.005	0.036	ca	No
5103-74-2	gamma-Chlordane	ug/L	0.0049	0.005	0.027	ca	No
76-44-8	Heptachlor	ug/L	0.0081	0.0082	0.0018	ca	**Yes**
1024-57-3	Heptachlor epoxide	ug/L	0.0029	0.0029	0.0033	ca	No
193-39-5	Indeno(1,2,3-cd)pyrene	ug/L	0.041	0.042	0.029	ca	**Yes**
98-82-8	Isopropylbenzene	ug/L	0.28	0.28	39	nc	No
7439-92-1	Lead	ug/L	10	20	15	AL	**Yes**
7439-96-5	Manganese	ug/L	14	14	32	nc	No
72-43-5	Methoxychlor	ug/L	0.0037	0.0037	2.7	nc	No
79-20-9	Methyl acetate	ug/L	0.76	0.76	1600	nc	No
108-87-2	Methylcyclohexane	ug/L	0.54	0.54	1300	nc	No
75-09-2	Methylene chloride	ug/L	1.3	1.3	8.4	nc	No
1634-04-4	Methyl-tert-butyl ether (MTBE)	ug/L	1	1	12	ca	No
91-20-3	Naphthalene	ug/L	0.041	0.042	0.14	ca	No
7440-02-0	Nickel	ug/L	37.2	37.2	30	nc	**Yes**
129-00-0	Pyrene	ug/L	0.041	0.042	8.7	nc	No
7782-49-2	Selenium	ug/L	164	164	7.8	nc	**Yes**
7440-22-4	Silver	ug/L	2.5	20.8	7.1	nc	**Yes**
100-42-5	Styrene	ug/L	0.24	0.24	110	nc	No
127-18-4	Tetrachloroethene	ug/L	0.42	0.42	3.5	nc	No
108-88-3	Toluene	ug/L	0.28	0.28	86	nc	No
8001-35-2	Toxaphene	ug/L	0.37	0.37	0.013	ca	**Yes**
156-60-5	trans-1,2-Dichloroethene	ug/L	0.5	0.5	8.6	nc	No
10061-02-6	trans-1,3-Dichloropropene	ug/L	0.6	0.6	0.41	ca	**Yes**
79-01-6	Trichloroethene	ug/L	0.38	0.38	0.26	nc	**Yes**
75-69-4	Trichlorofluoromethane (Freon-11)	ug/L	0.24	0.24	110	nc	No
7440-62-2	Vanadium	ug/L	17.6	17.6	7.8	nc	**Yes**
75-01-4	Vinyl chloride	ug/L	0.36	0.36	0.015	ca	**Yes**
1330-20-7	Xylene, total	ug/L	1	1	19	nc	No
7440-66-6	Zinc	ug/L	160	160	470	nc	No

Attachment E-7

Screening of Non-Detects: Surface Water

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

CAS	Chemical	Units	Min Result	Max Result	Tapwater RSL [1]	Tapwater RSL Basis	Max DL > Tapwater RSL

Notes:

Only analytes that were 100% non-detect in surface water are included on this table.

[1] Regional Screening Levels for Tapwater (May 2012). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1

The SL for 1,3-Dichloropropene was used as the SL for cis-1,3-Dichloropropene.

The SL for 1,3-Dichloropropene was used as the SL for trans-1,3-Dichloropropene.

The SL for Cyclohexane was used as the SL for Methylcyclohexane.

The SL for Pyrene was used as the SL for for Benzo(g,h,i)perylene.

The SL for Acenaphthene was used as the SL for for Acenaphthylene.

The SL for 'Hexachlorocyclohexane, Technical' was used as the SL for alpha-BHC.

The SL for Chlordane was used as the SL for gamma-Chlordane.

The SL for 1,4-Dichlorobenzene was used as the SL for 1,3-Dichlorobenzene.

The Federal Action Level for Lead is used as its SL.

The SL for 'Manganese Non-diet' was used as the SL for Manganese.

The SL for 'Nickel Soluble Salts' was used as the SL for Nickel.

The SL for 'Beryllium and Compounds' was used as the SL for Beryllium.

The SL for 'Chromium (III)' was used as the SL for Chromium.

The SL for 'Vanadium and compounds' was used as the SL for Vanadium.

The SL for 'Zinc and compounds' was used as the SL for Zinc.

The SL for 'Endosulfan' was used as the SL for Endosulfan I.

ca = Carcinogenic

DL = Detection limit

ug/L = Microgram per liter

nc = Noncarcinogenic

RSL = Regional Screening Level

Attachment E-8
Analytical Data Used in the HHRA

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	100-41-4	Ethylbenzene	0.0029	UJ	MG/KG	0.0015	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	100-42-5	Styrene	0.0012	UJ	MG/KG	0.00059	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	10061-01-5	cis-1,3-Dichloropropene	0.0018	UJ	MG/KG	0.00089	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	10061-02-6	trans-1,3-Dichloropropene	0.0042	UJ	MG/KG	0.0021	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	1024-57-3	Heptachlor epoxide	0.00092	UJ	MG/KG	0.00046	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	1031-07-8	Endosulfan sulfate	0.0012	U	MG/KG	0.00061	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	106-46-7	1,4-Dichlorobenzene	0.0028	UJ	MG/KG	0.0014	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	106-93-4	1,2-Dibromoethane	0.0035	UJ	MG/KG	0.0017	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	107-06-2	1,2-Dichloroethane	0.0042	UJ	MG/KG	0.0021	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	108-10-1	4-Methyl-2-pentanone	0.0068	UJ	MG/KG	0.0034	0.0212	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	108-87-2	Methylcyclohexane	0.0018	UJ	MG/KG	0.00091	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	108-88-3	Toluene	0.0012	UJ	MG/KG	0.00061	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	108-90-7	Chlorobenzene	0.0015	UJ	MG/KG	0.00074	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	110-82-7	Cyclohexane	0.0042	UJ	MG/KG	0.0021	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	11096-82-5	Aroclor-1260	0.019	U	MG/KG	0.0094	0.046	8082	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	11097-69-1	Aroclor-1254	0.029	U	MG/KG	0.015	0.046	8082	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	11104-28-2	Aroclor-1221	0.037	U	MG/KG	0.018	0.046	8082	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	11141-16-5	Aroclor-1232	0.046	U	MG/KG	0.031	0.046	8082	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	120-12-7	Anthracene	0.0204	U	MG/KG	0.0102	0.0256	8270C_SIM	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	120-82-1	1,2,4-Trichlorobenzene	0.0027	UJ	MG/KG	0.0013	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	124-48-1	Dibromochloromethane	0.0019	UJ	MG/KG	0.00097	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	12672-29-6	Aroclor-1248	0.034	U	MG/KG	0.017	0.046	8082	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	12674-11-2	Aroclor-1016	0.04	U	MG/KG	0.02	0.046	8082	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	127-18-4	Tetrachloroethene	0.0028	J	MG/KG	0.002	0.0042	8260B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	129-00-0	Pyrene	0.0674	=	MG/KG	0.0102	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	1330-20-7	Xylene, total	0.0029	UJ	MG/KG	0.0014	0.0085	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	156-59-2	cis-1,2-Dichloroethene	0.0026	UJ	MG/KG	0.0013	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	156-60-5	trans-1,2-Dichloroethene	0.0016	UJ	MG/KG	0.00082	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0018	UJ	MG/KG	0.00091	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	18496-25-8	Sulfide	99	=	MG/KG	7	30	9031	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	18540-29-9	Chromium (hexavalent)	5.28	=	MG/KG	0.478	1.91	7196A	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	191-24-2	Benzo(g,h,i)perylene	0.06	J	MG/KG	0.0238	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	193-39-5	Indeno(1,2,3-cd)pyrene	0.0505	J	MG/KG	0.0231	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	205-99-2	Benzo(b)fluoranthene	0.124	J	MG/KG	0.0146	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	206-44-0	Fluoranthene	0.049	J	MG/KG	0.0102	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	207-08-9	Benzo(k)fluoranthene	0.0398	J	MG/KG	0.0161	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	208-96-8	Acenaphthylene	0.0204	U	MG/KG	0.0102	0.0256	8270C_SIM	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	218-01-9	Chrysene	0.0495	=	MG/KG	0.01	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	309-00-2	Aldrin	0.00092	UJ	MG/KG	0.00046	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	319-84-6	alpha-BHC	0.0046	U	MG/KG	0.003	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	319-85-7	beta-BHC	0.00092	U	MG/KG	0.00046	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	319-86-8	delta-BHC	0.0017	UJ	MG/KG	0.00086	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	33213-65-9	Endosulfan II	0.0018	U	MG/KG	0.00089	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	50-29-3	4,4'-DDT	0.0032	J	MG/KG	0.0012	0.0046	8081A	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	50-32-8	Benzo(a)pyrene	0.0778	J	MG/KG	0.0138	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	5103-71-9	alpha-Chlordane	0.00098	UJ	MG/KG	0.00049	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	5103-74-2	gamma-Chlordane	0.001	U	MG/KG	0.00052	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	53469-21-9	Aroclor-1242	0.034	U	MG/KG	0.017	0.046	8082	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	53494-70-5	Endrin ketone	0.0013	U	MG/KG	0.00064	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	53-70-3	Dibenz(a,h)anthracene	0.0256	U	MG/KG	0.02	0.0256	8270C_SIM	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	541-73-1	1,3-Dichlorobenzene	0.0019	UJ	MG/KG	0.00095	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	56-23-5	Carbon tetrachloride	0.0025	UJ	MG/KG	0.0013	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	56-55-3	Benzo(a)anthracene	0.0397	=	MG/KG	0.0108	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	58-89-9	gamma-BHC (Lindane)	0.0012	U	MG/KG	0.00061	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	591-78-6	2-Hexanone	0.0055	UJ	MG/KG	0.0028	0.0212	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	60-57-1	Dieldrin	0.00098	U	MG/KG	0.00049	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	67-64-1	Acetone	0.0807	J	MG/KG	0.0028	0.0212	8260B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	67-66-3	Chloroform	0.0023	UJ	MG/KG	0.0011	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	71-43-2	Benzene	0.0021	UJ	MG/KG	0.001	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	71-55-6	1,1,1-Trichloroethane	0.0014	UJ	MG/KG	0.00068	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	72-20-8	Endrin	0.0016	U	MG/KG	0.0008	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	72-43-5	Methoxychlor	0.0017	U	MG/KG	0.00083	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	72-54-8	4,4'-DDD	0.059	J	MG/KG	0.0016	0.0046	8081A	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	72-55-9	4,4'-DDE	0.094	J	MG/KG	0.00083	0.0046	8081A	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7421-93-4	Endrin aldehyde	0.0022	U	MG/KG	0.0011	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7429-90-5	Aluminum	8980	J	MG/KG	19.4	102	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7439-89-6	Iron	26700	=	MG/KG	6.14	51.1	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7439-92-1	Lead	442	=	MG/KG	3.48	8.18	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7439-95-4	Magnesium	6430	J	MG/KG	29.7	102	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7439-96-5	Manganese	294	=	MG/KG	1.64	5.11	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7439-97-6	Mercury	0.088	=	MG/KG	0.00429	0.0232	7471A	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-02-0	Nickel	10.2	J	MG/KG	1.64	5.11	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-09-7	Potassium	1760	=	MG/KG	51.1	511	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-22-4	Silver	0.295	J	MG/KG	0.233	0.728	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-23-5	Sodium	12600	J	MG/KG	102	307	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-28-0	Thallium	6.96	U	MG/KG	3.48	10.2	6010B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-36-0	Antimony	3.19	J	MG/KG	0.35	1.46	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-38-2	Arsenic	3.9	=	MG/KG	0.69	0.93	6020	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-39-3	Barium	25.8	=	MG/KG	1.64	5.11	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-41-7	Beryllium	3.27	U	MG/KG	1.64	5.11	6010B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-43-9	Cadmium	1.98	J	MG/KG	0.511	5.11	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-47-3	Chromium	16.7	=	MG/KG	0.26	1.9	6020	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-48-4	Cobalt	5.14	=	MG/KG	0.511	5.11	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-50-8	Copper	138	J	MG/KG	1.64	5.11	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-62-2	Vanadium	38.6	=	MG/KG	1.64	5.11	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-66-6	Zinc	440	=	MG/KG	3.38	10.2	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7440-70-2	Calcium	114000	=	MG/KG	33.8	102	6010B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	74-83-9	Bromomethane	0.0042	UJ	MG/KG	0.0025	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	74-87-3	Chloromethane	0.0016	UJ	MG/KG	0.0008	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	74-97-5	Bromochloromethane	0.0038	UJ	MG/KG	0.0019	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-00-3	Chloroethane	0.0031	UJ	MG/KG	0.0016	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-01-4	Vinyl chloride	0.0025	UJ	MG/KG	0.0013	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-09-2	Methylene chloride	0.0051	UJ	MG/KG	0.0025	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-15-0	Carbon disulfide	0.004	J	MG/KG	0.0032	0.0042	8260B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-25-2	Bromoform	0.0019	UJ	MG/KG	0.00097	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-27-4	Bromodichloromethane	0.0014	UJ	MG/KG	0.00068	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-34-3	1,1-Dichloroethane	0.0014	UJ	MG/KG	0.00072	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-35-4	1,1-Dichloroethene	0.0014	UJ	MG/KG	0.00072	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-69-4	Trichlorofluoromethane (Freon-11)	0.0019	UJ	MG/KG	0.00093	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0025	UJ	MG/KG	0.0013	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.0027	UJ	MG/KG	0.0013	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	76-44-8	Heptachlor	0.0012	U	MG/KG	0.00061	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7664-41-7	Ammonia	60.6	=	MG/KG	0.369	1.84	350.1	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	7782-49-2	Selenium	0.93	U	MG/KG	0.28	4.7	6020	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	78-87-5	1,2-Dichloropropane	0.0027	UJ	MG/KG	0.0013	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	78-93-3	2-Butanone	0.0239	J	MG/KG	0.003	0.0212	8260B	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	79-00-5	1,1,2-Trichloroethane	0.0035	UJ	MG/KG	0.0017	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	79-01-6	Trichloroethene	0.0019	UJ	MG/KG	0.00093	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	79-20-9	Methyl acetate	0.0085	UJ	MG/KG	0.0042	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	79-34-5	1,1,2,2-Tetrachloroethane	0.0025	UJ	MG/KG	0.0012	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	8001-35-2	Toxaphene	0.15	U	MG/KG	0.1	0.15	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	83-32-9	Acenaphthene	0.0204	U	MG/KG	0.0102	0.0256	8270C_SIM	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	85-01-8	Phenanthrene	0.027	=	MG/KG	0.0102	0.0256	8270C_SIM	TRUE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	86-73-7	Fluorene	0.0204	U	MG/KG	0.0102	0.0256	8270C_SIM	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	87-61-6	1,2,3-Trichlorobenzene	0.0026	UJ	MG/KG	0.0013	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	90-12-0	1-Methylnaphthalene	0.0204	UJ	MG/KG	0.0102	0.0256	8270C_SIM	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	91-20-3	Naphthalene	0.0204	U	MG/KG	0.0102	0.0256	8270C_SIM	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	91-57-6	2-Methylnaphthalene	0.0204	U	MG/KG	0.0102	0.0256	8270C_SIM	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	95-50-1	1,2-Dichlorobenzene	0.0024	UJ	MG/KG	0.0012	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	959-98-8	Endosulfan I	0.0014	U	MG/KG	0.00068	0.0046	8081A	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	96-12-8	1,2-Dibromo-3-chloropropane	0.0106	UJ	MG/KG	0.0059	0.0106	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	98-82-8	Isopropylbenzene	0.0025	UJ	MG/KG	0.0013	0.0042	8260B	FALSE
VWW06-SD003	VWW06-SD003-0211	0	0.5	04-Feb-11	SD	TOC	Total organic carbon (TOC)	18000	J	MG/KG	18	48	9060	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	100-41-4	Ethylbenzene	0.0022	UJ	MG/KG	0.0011	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	100-42-5	Styrene	0.00088	UJ	MG/KG	0.00044	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	10061-01-5	cis-1,3-Dichloropropene	0.0013	UJ	MG/KG	0.00066	0.0031	8260B	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	10061-02-6	trans-1,3-Dichloropropene	0.0031	UJ	MG/KG	0.0016	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	1024-57-3	Heptachlor epoxide	0.0009	U	MG/KG	0.00045	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	1031-07-8	Endosulfan sulfate	0.0012	U	MG/KG	0.0006	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	106-46-7	1,4-Dichlorobenzene	0.002	UJ	MG/KG	0.001	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	106-93-4	1,2-Dibromoethane	0.0026	UJ	MG/KG	0.0013	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	107-06-2	1,2-Dichloroethane	0.0031	UJ	MG/KG	0.0016	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	108-10-1	4-Methyl-2-pentanone	0.005	UJ	MG/KG	0.0025	0.0157	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	108-87-2	Methylcyclohexane	0.0014	UJ	MG/KG	0.00068	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	108-88-3	Toluene	0.00091	UJ	MG/KG	0.00046	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	108-90-7	Chlorobenzene	0.0011	UJ	MG/KG	0.00055	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	110-82-7	Cyclohexane	0.0031	UJ	MG/KG	0.0016	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	11096-82-5	Aroclor-1260	0.018	U	MG/KG	0.0091	0.045	8082	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	11097-69-1	Aroclor-1254	0.16	=	MG/KG	0.014	0.045	8082	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	11104-28-2	Aroclor-1221	0.036	U	MG/KG	0.018	0.045	8082	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	11141-16-5	Aroclor-1232	0.045	U	MG/KG	0.03	0.045	8082	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	120-12-7	Anthracene	0.0282	=	MG/KG	0.0098	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	120-82-1	1,2,4-Trichlorobenzene	0.002	UJ	MG/KG	0.00099	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	124-48-1	Dibromochloromethane	0.0014	UJ	MG/KG	0.00072	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	12672-29-6	Aroclor-1248	0.033	U	MG/KG	0.016	0.045	8082	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	12674-11-2	Aroclor-1016	0.039	U	MG/KG	0.019	0.045	8082	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	127-18-4	Tetrachloroethene	0.0022	J	MG/KG	0.0015	0.0031	8260B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	129-00-0	Pyrene	0.125	=	MG/KG	0.0098	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	1330-20-7	Xylene, total	0.0021	UJ	MG/KG	0.0011	0.0063	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	156-59-2	cis-1,2-Dichloroethene	0.0019	UJ	MG/KG	0.00097	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	156-60-5	trans-1,2-Dichloroethene	0.0012	UJ	MG/KG	0.00061	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0014	UJ	MG/KG	0.00068	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	18496-25-8	Sulfide	130	=	MG/KG	7	30	9031	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	18540-29-9	Chromium (hexavalent)	0.891	U	MG/KG	0.445	1.78	7196A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	191-24-2	Benzo(g,h,i)perylene	0.0388	=	MG/KG	0.0228	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	193-39-5	Indeno(1,2,3-cd)pyrene	0.0349	=	MG/KG	0.0221	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	205-99-2	Benzo(b)fluoranthene	0.0874	=	MG/KG	0.014	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	206-44-0	Fluoranthene	0.0917	=	MG/KG	0.0098	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	207-08-9	Benzo(k)fluoranthene	0.0315	=	MG/KG	0.0154	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	208-96-8	Acenaphthylene	0.0196	U	MG/KG	0.0098	0.0245	8270C_SIM	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	218-01-9	Chrysene	0.0631	=	MG/KG	0.0096	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	309-00-2	Aldrin	0.0009	U	MG/KG	0.00045	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	319-84-6	alpha-BHC	0.0045	U	MG/KG	0.0029	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	319-85-7	beta-BHC	0.0009	U	MG/KG	0.00045	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	319-86-8	delta-BHC	0.0017	U	MG/KG	0.00084	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	33213-65-9	Endosulfan II	0.0017	U	MG/KG	0.00086	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	50-29-3	4,4'-DDT	0.0023	U	MG/KG	0.0011	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	50-32-8	Benzo(a)pyrene	0.0651	=	MG/KG	0.0132	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	5103-71-9	alpha-Chlordane	0.00096	U	MG/KG	0.00048	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	5103-74-2	gamma-Chlordane	0.001	U	MG/KG	0.00051	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	53469-21-9	Aroclor-1242	0.033	U	MG/KG	0.016	0.045	8082	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	53494-70-5	Endrin ketone	0.0012	U	MG/KG	0.00063	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	53-70-3	Dibenz(a,h)anthracene	0.0245	U	MG/KG	0.0191	0.0245	8270C_SIM	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	541-73-1	1,3-Dichlorobenzene	0.0014	UJ	MG/KG	0.00071	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	56-23-5	Carbon tetrachloride	0.0019	UJ	MG/KG	0.00094	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	56-55-3	Benzo(a)anthracene	0.0667	=	MG/KG	0.0103	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	58-89-9	gamma-BHC (Lindane)	0.0012	U	MG/KG	0.0006	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	591-78-6	2-Hexanone	0.0041	UJ	MG/KG	0.002	0.0157	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	60-57-1	Dieldrin	0.00096	U	MG/KG	0.00048	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	67-64-1	Acetone	0.0296	J	MG/KG	0.002	0.0157	8260B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	67-66-3	Chloroform	0.0017	UJ	MG/KG	0.00085	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	71-43-2	Benzene	0.0016	UJ	MG/KG	0.00078	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	71-55-6	1,1,1-Trichloroethane	0.001	UJ	MG/KG	0.0005	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	72-20-8	Endrin	0.0016	U	MG/KG	0.00078	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	72-43-5	Methoxychlor	0.0016	U	MG/KG	0.0008	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	72-54-8	4,4'-DDD	0.014	J	MG/KG	0.0015	0.0045	8081A	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	72-55-9	4,4'-DDE	0.028	J	MG/KG	0.0008	0.0045	8081A	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7421-93-4	Endrin aldehyde	0.0021	U	MG/KG	0.0011	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7429-90-5	Aluminum	7820	J	MG/KG	18.8	98.8	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7439-89-6	Iron	18800	=	MG/KG	5.93	49.4	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7439-92-1	Lead	185	=	MG/KG	3.36	7.91	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7439-95-4	Magnesium	5390	J	MG/KG	28.7	98.8	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7439-96-5	Manganese	245	=	MG/KG	1.58	4.94	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7439-97-6	Mercury	0.0642	=	MG/KG	0.00355	0.0192	7471A	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-02-0	Nickel	6.41	J	MG/KG	1.58	4.94	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-09-7	Potassium	1700	=	MG/KG	49.4	494	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-22-4	Silver	0.246	J	MG/KG	0.22	0.686	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-23-5	Sodium	12600	J	MG/KG	98.8	296	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-28-0	Thallium	6.72	U	MG/KG	3.36	9.88	6010B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-36-0	Antimony	1.12	J	MG/KG	0.33	1.37	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-38-2	Arsenic	2.4	=	MG/KG	0.68	0.92	6020	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-39-3	Barium	15.1	=	MG/KG	1.58	4.94	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-41-7	Beryllium	3.16	U	MG/KG	1.58	4.94	6010B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-43-9	Cadmium	1.75	J	MG/KG	0.494	4.94	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-47-3	Chromium	12.2	=	MG/KG	0.26	1.8	6020	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-48-4	Cobalt	4.13	J	MG/KG	0.494	4.94	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-50-8	Copper	73.4	J	MG/KG	1.58	4.94	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-62-2	Vanadium	32.6	=	MG/KG	1.58	4.94	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-66-6	Zinc	262	=	MG/KG	3.26	9.88	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7440-70-2	Calcium	94400	=	MG/KG	32.6	98.8	6010B	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	74-83-9	Bromomethane	0.0031	UJ	MG/KG	0.0019	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	74-87-3	Chloromethane	0.0012	UJ	MG/KG	0.0006	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	74-97-5	Bromochloromethane	0.0028	UJ	MG/KG	0.0014	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-00-3	Chloroethane	0.0023	UJ	MG/KG	0.0012	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-01-4	Vinyl chloride	0.0019	UJ	MG/KG	0.00094	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-09-2	Methylene chloride	0.0038	UJ	MG/KG	0.0019	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-15-0	Carbon disulfide	0.0031	UJ	MG/KG	0.0024	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-25-2	Bromoform	0.0014	UJ	MG/KG	0.00072	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-27-4	Bromodichloromethane	0.001	UJ	MG/KG	0.0005	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-34-3	1,1-Dichloroethane	0.0011	UJ	MG/KG	0.00053	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-35-4	1,1-Dichloroethene	0.0011	UJ	MG/KG	0.00053	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-69-4	Trichlorofluoromethane (Freon-11)	0.0014	UJ	MG/KG	0.00069	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0019	UJ	MG/KG	0.00094	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.002	UJ	MG/KG	0.00099	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	76-44-8	Heptachlor	0.0012	U	MG/KG	0.0006	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7664-41-7	Ammonia	62.5	=	MG/KG	0.323	1.62	350.1	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	7782-49-2	Selenium	0.92	U	MG/KG	0.28	4.6	6020	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	78-87-5	1,2-Dichloropropane	0.002	UJ	MG/KG	0.00099	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	78-93-3	2-Butanone	0.0044	UJ	MG/KG	0.0022	0.0157	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	79-00-5	1,1,2-Trichloroethane	0.0026	UJ	MG/KG	0.0013	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	79-01-6	Trichloroethene	0.0014	UJ	MG/KG	0.00069	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	79-20-9	Methyl acetate	0.0063	UJ	MG/KG	0.0031	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	79-34-5	1,1,2,2-Tetrachloroethane	0.0018	UJ	MG/KG	0.00093	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	8001-35-2	Toxaphene	0.15	U	MG/KG	0.099	0.15	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	83-32-9	Acenaphthene	0.0119	J	MG/KG	0.0098	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	85-01-8	Phenanthrene	0.111	=	MG/KG	0.0098	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	86-73-7	Fluorene	0.0116	J	MG/KG	0.0098	0.0245	8270C_SIM	TRUE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	87-61-6	1,2,3-Trichlorobenzene	0.0019	UJ	MG/KG	0.00096	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	90-12-0	1-Methylnaphthalene	0.0196	UJ	MG/KG	0.0098	0.0245	8270C_SIM	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	91-20-3	Naphthalene	0.0196	U	MG/KG	0.0098	0.0245	8270C_SIM	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	91-57-6	2-Methylnaphthalene	0.0196	U	MG/KG	0.0098	0.0245	8270C_SIM	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	95-50-1	1,2-Dichlorobenzene	0.0018	UJ	MG/KG	0.00088	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	959-98-8	Endosulfan I	0.0013	U	MG/KG	0.00066	0.0045	8081A	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	96-12-8	1,2-Dibromo-3-chloropropane	0.0078	UJ	MG/KG	0.0044	0.0078	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	98-82-8	Isopropylbenzene	0.0019	UJ	MG/KG	0.00094	0.0031	8260B	FALSE
VWW06-SD004	VWW06-SD004-0211	0	0.5	04-Feb-11	SD	TOC	Total organic carbon (TOC)	16000	J	MG/KG	14	37	9060	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	100-41-4	Ethylbenzene	0.0021	U	MG/KG	0.001	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	100-42-5	Styrene	0.00085	U	MG/KG	0.00042	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	10061-01-5	cis-1,3-Dichloropropene	0.0013	U	MG/KG	0.00064	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	10061-02-6	trans-1,3-Dichloropropene	0.003	U	MG/KG	0.0015	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	1024-57-3	Heptachlor epoxide	0.00077	UJ	MG/KG	0.00039	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	1031-07-8	Endosulfan sulfate	0.001	UJ	MG/KG	0.00052	0.0039	8081A	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	106-46-7	1,4-Dichlorobenzene	0.002	U	MG/KG	0.00099	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	106-93-4	1,2-Dibromoethane	0.0025	U	MG/KG	0.0012	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	107-06-2	1,2-Dichloroethane	0.003	U	MG/KG	0.0015	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	108-10-1	4-Methyl-2-pentanone	0.0048	U	MG/KG	0.0024	0.0152	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	108-87-2	Methylcyclohexane	0.0013	U	MG/KG	0.00065	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	108-88-3	Toluene	0.00088	U	MG/KG	0.00044	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	108-90-7	Chlorobenzene	0.0011	U	MG/KG	0.00053	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	110-82-7	Cyclohexane	0.003	U	MG/KG	0.0015	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	11096-82-5	Aroclor-1260	0.016	UJ	MG/KG	0.0079	0.039	8082	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	11097-69-1	Aroclor-1254	0.032	J	MG/KG	0.012	0.039	8082	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	11104-28-2	Aroclor-1221	0.031	UJ	MG/KG	0.015	0.039	8082	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	11141-16-5	Aroclor-1232	0.039	UJ	MG/KG	0.026	0.039	8082	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	120-12-7	Anthracene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	120-82-1	1,2,4-Trichlorobenzene	0.0019	U	MG/KG	0.00096	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	124-48-1	Dibromochloromethane	0.0014	U	MG/KG	0.0007	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	12672-29-6	Aroclor-1248	0.028	UJ	MG/KG	0.014	0.039	8082	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	12674-11-2	Aroclor-1016	0.034	UJ	MG/KG	0.017	0.039	8082	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	127-18-4	Tetrachloroethene	0.0018	J	MG/KG	0.0014	0.003	8260B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	129-00-0	Pyrene	0.0319	J	MG/KG	0.0085	0.0213	8270C_SIM	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	1330-20-7	Xylene, total	0.0021	U	MG/KG	0.001	0.0061	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	156-59-2	cis-1,2-Dichloroethene	0.0019	U	MG/KG	0.00094	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	156-60-5	trans-1,2-Dichloroethene	0.0012	U	MG/KG	0.00059	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0013	U	MG/KG	0.00065	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	18496-25-8	Sulfide	160	=	MG/KG	7	30	9031	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	18540-29-9	Chromium (hexavalent)	0.836	UJ	MG/KG	0.418	1.67	7196A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	191-24-2	Benzo(g,h,i)perylene	0.0213	UJ	MG/KG	0.0198	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	193-39-5	Indeno(1,2,3-cd)pyrene	0.0213	UJ	MG/KG	0.0192	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	205-99-2	Benzo(b)fluoranthene	0.0405	J	MG/KG	0.0121	0.0213	8270C_SIM	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	206-44-0	Fluoranthene	0.0295	J	MG/KG	0.0085	0.0213	8270C_SIM	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	207-08-9	Benzo(k)fluoranthene	0.0162	J	MG/KG	0.0134	0.0213	8270C_SIM	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	208-96-8	Acenaphthylene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	218-01-9	Chrysene	0.0211	J	MG/KG	0.0083	0.0213	8270C_SIM	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	309-00-2	Aldrin	0.00077	UJ	MG/KG	0.00039	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	319-84-6	alpha-BHC	0.0039	UJ	MG/KG	0.0025	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	319-85-7	beta-BHC	0.00077	UJ	MG/KG	0.00039	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	319-86-8	delta-BHC	0.0014	UJ	MG/KG	0.00072	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	33213-65-9	Endosulfan II	0.0015	UJ	MG/KG	0.00075	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	50-29-3	4,4'-DDT	0.002	UJ	MG/KG	0.00098	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	50-32-8	Benzo(a)pyrene	0.0245	J	MG/KG	0.0115	0.0213	8270C_SIM	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	5103-71-9	alpha-Chlordane	0.00082	UJ	MG/KG	0.00041	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	5103-74-2	gamma-Chlordane	0.00088	UJ	MG/KG	0.00044	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	53469-21-9	Aroclor-1242	0.028	UJ	MG/KG	0.014	0.039	8082	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	53494-70-5	Endrin ketone	0.0011	UJ	MG/KG	0.00054	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	53-70-3	Dibenz(a,h)anthracene	0.0213	UJ	MG/KG	0.0166	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	541-73-1	1,3-Dichlorobenzene	0.0014	U	MG/KG	0.00068	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	56-23-5	Carbon tetrachloride	0.0018	U	MG/KG	0.00091	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	56-55-3	Benzo(a)anthracene	0.0226	J	MG/KG	0.0089	0.0213	8270C_SIM	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	58-89-9	gamma-BHC (Lindane)	0.001	UJ	MG/KG	0.00052	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	591-78-6	2-Hexanone	0.0039	U	MG/KG	0.002	0.0152	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	60-57-1	Dieldrin	0.00082	UJ	MG/KG	0.00041	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	67-64-1	Acetone	0.0869	=	MG/KG	0.002	0.0152	8260B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	67-66-3	Chloroform	0.0016	U	MG/KG	0.00082	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	71-43-2	Benzene	0.0015	U	MG/KG	0.00076	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	71-55-6	1,1,1-Trichloroethane	0.00097	U	MG/KG	0.00048	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	72-20-8	Endrin	0.0013	UJ	MG/KG	0.00067	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	72-43-5	Methoxychlor	0.0014	UJ	MG/KG	0.0007	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	72-54-8	4,4'-DDD	0.0046	J	MG/KG	0.0013	0.0039	8081A	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	72-55-9	4,4'-DDE	0.0097	J	MG/KG	0.0007	0.0039	8081A	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7421-93-4	Endrin aldehyde	0.0018	UJ	MG/KG	0.00093	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7429-90-5	Aluminum	10700	J	MG/KG	16.4	86.2	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7439-89-6	Iron	26400	J	MG/KG	5.18	43.1	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7439-92-1	Lead	157	J	MG/KG	2.93	6.9	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7439-95-4	Magnesium	7660	J	MG/KG	25	86.2	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7439-96-5	Manganese	266	J	MG/KG	1.38	4.31	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7439-97-6	Mercury	0.0446	J	MG/KG	0.00351	0.019	7471A	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-02-0	Nickel	11.4	J	MG/KG	1.38	4.31	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-09-7	Potassium	1940	J	MG/KG	43.1	431	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-22-4	Silver	0.42	UJ	MG/KG	0.21	0.657	6010B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-23-5	Sodium	9270	J	MG/KG	86.2	259	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-28-0	Thallium	5.17	J	MG/KG	2.93	8.62	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-36-0	Antimony	0.631	UJ	MG/KG	0.315	1.31	6010B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-38-2	Arsenic	2.2	J	MG/KG	0.45	0.61	6020	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-39-3	Barium	18.5	J	MG/KG	1.38	4.31	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-41-7	Beryllium	2.76	UJ	MG/KG	1.38	4.31	6010B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-43-9	Cadmium	4.14	J	MG/KG	0.431	4.31	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-47-3	Chromium	12.5	J	MG/KG	0.17	1.2	6020	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-48-4	Cobalt	7.89	J	MG/KG	0.431	4.31	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-50-8	Copper	71.5	J	MG/KG	1.38	4.31	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-62-2	Vanadium	59.7	J	MG/KG	1.38	4.31	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-66-6	Zinc	237	J	MG/KG	2.85	8.62	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7440-70-2	Calcium	87100	J	MG/KG	28.5	86.2	6010B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	74-83-9	Bromomethane	0.003	U	MG/KG	0.0018	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	74-87-3	Chloromethane	0.0012	U	MG/KG	0.00058	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	74-97-5	Bromochloromethane	0.0027	U	MG/KG	0.0014	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-00-3	Chloroethane	0.0022	U	MG/KG	0.0011	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-01-4	Vinyl chloride	0.0018	U	MG/KG	0.00091	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-09-2	Methylene chloride	0.0036	U	MG/KG	0.0018	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-15-0	Carbon disulfide	0.003	U	MG/KG	0.0023	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-25-2	Bromoform	0.0014	U	MG/KG	0.0007	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-27-4	Bromodichloromethane	0.00097	U	MG/KG	0.00048	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-34-3	1,1-Dichloroethane	0.001	U	MG/KG	0.00052	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-35-4	1,1-Dichloroethene	0.001	U	MG/KG	0.00052	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-69-4	Trichlorofluoromethane (Freon-11)	0.0013	U	MG/KG	0.00067	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0018	U	MG/KG	0.00091	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.0019	U	MG/KG	0.00096	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	76-44-8	Heptachlor	0.001	UJ	MG/KG	0.00052	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7664-41-7	Ammonia	53.1	=	MG/KG	0.285	1.43	350.1	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	7782-49-2	Selenium	0.61	UJ	MG/KG	0.18	3.1	6020	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	78-87-5	1,2-Dichloropropane	0.0019	U	MG/KG	0.00096	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	78-93-3	2-Butanone	0.0195	=	MG/KG	0.0021	0.0152	8260B	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	79-00-5	1,1,2-Trichloroethane	0.0025	U	MG/KG	0.0012	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	79-01-6	Trichloroethene	0.0013	U	MG/KG	0.00067	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	79-20-9	Methyl acetate	0.0061	U	MG/KG	0.003	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	79-34-5	1,1,2,2-Tetrachloroethane	0.0018	U	MG/KG	0.0009	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	8001-35-2	Toxaphene	0.13	UJ	MG/KG	0.086	0.13	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	83-32-9	Acenaphthene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	85-01-8	Phenanthrene	0.0091	J	MG/KG	0.0085	0.0213	8270C_SIM	TRUE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	86-73-7	Fluorene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	87-61-6	1,2,3-Trichlorobenzene	0.0018	U	MG/KG	0.00092	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	90-12-0	1-Methylnaphthalene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	91-20-3	Naphthalene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	91-57-6	2-Methylnaphthalene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	95-50-1	1,2-Dichlorobenzene	0.0017	U	MG/KG	0.00085	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	959-98-8	Endosulfan I	0.0011	UJ	MG/KG	0.00057	0.0039	8081A	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	96-12-8	1,2-Dibromo-3-chloropropane	0.0076	U	MG/KG	0.0042	0.0076	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	98-82-8	Isopropylbenzene	0.0018	U	MG/KG	0.00091	0.003	8260B	FALSE
VWW06-SD005	VWW06-SD005-0211	0	0.5	04-Feb-11	SD	TOC	Total organic carbon (TOC)	13000	J	MG/KG	23	62	9060	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	100-41-4	Ethylbenzene	0.0023	U	MG/KG	0.0011	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	100-42-5	Styrene	0.00092	U	MG/KG	0.00046	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	10061-01-5	cis-1,3-Dichloropropene	0.0014	U	MG/KG	0.00069	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	10061-02-6	trans-1,3-Dichloropropene	0.0033	U	MG/KG	0.0016	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	1024-57-3	Heptachlor epoxide	0.0008	UJ	MG/KG	0.0004	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	1031-07-8	Endosulfan sulfate	0.0011	UJ	MG/KG	0.00053	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	106-46-7	1,4-Dichlorobenzene	0.0021	U	MG/KG	0.0011	0.0082	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	106-93-4	1,2-Dibromoethane	0.0027	U	MG/KG	0.0014	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	107-06-2	1,2-Dichloroethane	0.0033	U	MG/KG	0.0016	0.0082	8260B	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	108-10-1	4-Methyl-2-pentanone	0.0053	U	MG/KG	0.0026	0.0165	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	108-87-2	Methylcyclohexane	0.0014	U	MG/KG	0.00071	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	108-88-3	Toluene	0.00096	U	MG/KG	0.00048	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	108-90-7	Chlorobenzene	0.0012	U	MG/KG	0.00058	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	110-82-7	Cyclohexane	0.0033	U	MG/KG	0.0016	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	11096-82-5	Aroclor-1260	0.016	UJ	MG/KG	0.0081	0.04	8082	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	11097-69-1	Aroclor-1254	0.03	J	MG/KG	0.013	0.04	8082	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	11104-28-2	Aroclor-1221	0.032	UJ	MG/KG	0.016	0.04	8082	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	11141-16-5	Aroclor-1232	0.04	UJ	MG/KG	0.027	0.04	8082	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	120-12-7	Anthracene	0.0188	J	MG/KG	0.009	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	120-82-1	1,2,4-Trichlorobenzene	0.0021	U	MG/KG	0.001	0.0082	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	124-48-1	Dibromochloromethane	0.0015	U	MG/KG	0.00076	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	12672-29-6	Aroclor-1248	0.029	UJ	MG/KG	0.015	0.04	8082	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	12674-11-2	Aroclor-1016	0.035	UJ	MG/KG	0.017	0.04	8082	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	127-18-4	Tetrachloroethene	0.0024	J	MG/KG	0.0015	0.0033	8260B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	129-00-0	Pyrene	0.106	J	MG/KG	0.009	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	1330-20-7	Xylene, total	0.0022	U	MG/KG	0.0011	0.0066	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	156-59-2	cis-1,2-Dichloroethene	0.002	U	MG/KG	0.001	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	156-60-5	trans-1,2-Dichloroethene	0.0013	U	MG/KG	0.00064	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0014	U	MG/KG	0.00071	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	18496-25-8	Sulfide	130	=	MG/KG	7	30	9031	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	18540-29-9	Chromium (hexavalent)	2.99	J	MG/KG	0.412	1.65	7196A	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	191-24-2	Benzo(g,h,i)perylene	0.0622	J	MG/KG	0.021	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	193-39-5	Indeno(1,2,3-cd)pyrene	0.0614	J	MG/KG	0.0203	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	205-99-2	Benzo(b)fluoranthene	0.16	J	MG/KG	0.0128	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	206-44-0	Fluoranthene	0.122	J	MG/KG	0.009	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	207-08-9	Benzo(k)fluoranthene	0.0634	J	MG/KG	0.0142	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	208-96-8	Acenaphthylene	0.02	J	MG/KG	0.009	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	218-01-9	Chrysene	0.0924	J	MG/KG	0.0088	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	309-00-2	Aldrin	0.0008	UJ	MG/KG	0.0004	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	319-84-6	alpha-BHC	0.004	UJ	MG/KG	0.0026	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	319-85-7	beta-BHC	0.0008	UJ	MG/KG	0.0004	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	319-86-8	delta-BHC	0.0015	UJ	MG/KG	0.00075	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	33213-65-9	Endosulfan II	0.0015	UJ	MG/KG	0.00077	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	50-29-3	4,4'-DDT	0.002	UJ	MG/KG	0.001	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	50-32-8	Benzo(a)pyrene	0.11	J	MG/KG	0.0122	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	5103-71-9	alpha-Chlordane	0.00085	UJ	MG/KG	0.00043	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	5103-74-2	gamma-Chlordane	0.00091	UJ	MG/KG	0.00045	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	53469-21-9	Aroclor-1242	0.029	UJ	MG/KG	0.015	0.04	8082	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	53494-70-5	Endrin ketone	0.0011	UJ	MG/KG	0.00056	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	53-70-3	Dibenz(a,h)anthracene	0.0225	UJ	MG/KG	0.0176	0.0225	8270C_SIM	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	541-73-1	1,3-Dichlorobenzene	0.0015	U	MG/KG	0.00074	0.0082	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	56-23-5	Carbon tetrachloride	0.002	U	MG/KG	0.00099	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	56-55-3	Benzo(a)anthracene	0.102	J	MG/KG	0.0095	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	58-89-9	gamma-BHC (Lindane)	0.0011	UJ	MG/KG	0.00053	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	591-78-6	2-Hexanone	0.0043	U	MG/KG	0.0021	0.0165	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	60-57-1	Dieldrin	0.00085	UJ	MG/KG	0.00043	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	67-64-1	Acetone	0.0498	J	MG/KG	0.0021	0.0165	8260B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	67-66-3	Chloroform	0.0018	U	MG/KG	0.00089	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	71-43-2	Benzene	0.0016	U	MG/KG	0.00082	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	71-55-6	1,1,1-Trichloroethane	0.001	U	MG/KG	0.00053	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	72-20-8	Endrin	0.0014	UJ	MG/KG	0.00069	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	72-43-5	Methoxychlor	0.0014	UJ	MG/KG	0.00072	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	72-54-8	4,4'-DDD	0.0028	J	MG/KG	0.0014	0.004	8081A	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	72-55-9	4,4'-DDE	0.0059	J	MG/KG	0.00072	0.004	8081A	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7421-93-4	Endrin aldehyde	0.0019	UJ	MG/KG	0.00096	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7429-90-5	Aluminum	7030	J	MG/KG	17.1	90.1	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7439-89-6	Iron	17100	J	MG/KG	5.4	45	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7439-92-1	Lead	93	J	MG/KG	3.06	7.21	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7439-95-4	Magnesium	7720	J	MG/KG	26.1	90.1	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7439-96-5	Manganese	123	J	MG/KG	1.44	4.5	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7439-97-6	Mercury	0.0336	J	MG/KG	0.00314	0.017	7471A	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-02-0	Nickel	8.36	J	MG/KG	1.44	4.5	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-09-7	Potassium	1360	J	MG/KG	45	450	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-22-4	Silver	0.406	UJ	MG/KG	0.203	0.634	6010B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-23-5	Sodium	10300	J	MG/KG	90.1	270	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-28-0	Thallium	6.13	UJ	MG/KG	3.06	9.01	6010B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-36-0	Antimony	3.88	J	MG/KG	0.369	1.54	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-38-2	Arsenic	4.8	J	MG/KG	0.46	0.62	6020	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-39-3	Barium	13.3	J	MG/KG	1.44	4.5	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-41-7	Beryllium	2.88	UJ	MG/KG	1.44	4.5	6010B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-43-9	Cadmium	1.65	J	MG/KG	0.45	4.5	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-47-3	Chromium	14.3	J	MG/KG	0.17	1.2	6020	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-48-4	Cobalt	3.12	J	MG/KG	0.45	4.5	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-50-8	Copper	54.1	J	MG/KG	1.44	4.5	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-62-2	Vanadium	26.7	J	MG/KG	1.44	4.5	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-66-6	Zinc	206	J	MG/KG	2.97	9.01	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7440-70-2	Calcium	140000	J	MG/KG	29.7	90.1	6010B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	74-83-9	Bromomethane	0.0033	U	MG/KG	0.002	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	74-87-3	Chloromethane	0.0012	U	MG/KG	0.00063	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	74-97-5	Bromochloromethane	0.003	U	MG/KG	0.0015	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-00-3	Chloroethane	0.0024	U	MG/KG	0.0012	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-01-4	Vinyl chloride	0.002	U	MG/KG	0.00099	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-09-2	Methylene chloride	0.004	U	MG/KG	0.002	0.0082	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-15-0	Carbon disulfide	0.0034	J	MG/KG	0.0025	0.0033	8260B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-25-2	Bromoform	0.0015	U	MG/KG	0.00076	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-27-4	Bromodichloromethane	0.001	U	MG/KG	0.00053	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-34-3	1,1-Dichloroethane	0.0011	U	MG/KG	0.00056	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-35-4	1,1-Dichloroethene	0.0011	U	MG/KG	0.00056	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-69-4	Trichlorofluoromethane (Freon-11)	0.0014	U	MG/KG	0.00073	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	75-71-8	Dichlorodifluoromethane (Freon-12)	0.002	U	MG/KG	0.00099	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.0021	U	MG/KG	0.001	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	76-44-8	Heptachlor	0.0011	UJ	MG/KG	0.00053	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7664-41-7	Ammonia	41.5	=	MG/KG	0.303	1.52	350.1	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	7782-49-2	Selenium	0.62	UJ	MG/KG	0.19	3.1	6020	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	78-87-5	1,2-Dichloropropane	0.0021	U	MG/KG	0.001	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	78-93-3	2-Butanone	0.0134	J	MG/KG	0.0023	0.0165	8260B	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	79-00-5	1,1,2-Trichloroethane	0.0027	U	MG/KG	0.0014	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	79-01-6	Trichloroethene	0.0014	U	MG/KG	0.00073	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	79-20-9	Methyl acetate	0.0066	U	MG/KG	0.0033	0.0082	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	79-34-5	1,1,2,2-Tetrachloroethane	0.0019	U	MG/KG	0.00097	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	8001-35-2	Toxaphene	0.13	UJ	MG/KG	0.089	0.13	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	83-32-9	Acenaphthene	0.018	UJ	MG/KG	0.009	0.0225	8270C_SIM	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	85-01-8	Phenanthrene	0.0098	J	MG/KG	0.009	0.0225	8270C_SIM	TRUE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	86-73-7	Fluorene	0.018	UJ	MG/KG	0.009	0.0225	8270C_SIM	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	87-61-6	1,2,3-Trichlorobenzene	0.002	U	MG/KG	0.001	0.0082	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	90-12-0	1-Methylnaphthalene	0.018	UJ	MG/KG	0.009	0.0225	8270C_SIM	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	91-20-3	Naphthalene	0.018	UJ	MG/KG	0.009	0.0225	8270C_SIM	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	91-57-6	2-Methylnaphthalene	0.018	UJ	MG/KG	0.009	0.0225	8270C_SIM	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	95-50-1	1,2-Dichlorobenzene	0.0018	U	MG/KG	0.00092	0.0082	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	959-98-8	Endosulfan I	0.0012	UJ	MG/KG	0.00059	0.004	8081A	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	96-12-8	1,2-Dibromo-3-chloropropane	0.0082	U	MG/KG	0.0046	0.0082	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	98-82-8	Isopropylbenzene	0.002	U	MG/KG	0.00099	0.0033	8260B	FALSE
VWW06-SD006	VWW06-SD006-0211	0	0.5	04-Feb-11	SD	TOC	Total organic carbon (TOC)	16000	J	MG/KG	30	78	9060	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	100-41-4	Ethylbenzene	0.003	UJ	MG/KG	0.0015	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	100-42-5	Styrene	0.0012	UJ	MG/KG	0.00062	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	10061-01-5	cis-1,3-Dichloropropene	0.0019	UJ	MG/KG	0.00093	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	10061-02-6	trans-1,3-Dichloropropene	0.0044	UJ	MG/KG	0.0022	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	1024-57-3	Heptachlor epoxide	0.00093	UJ	MG/KG	0.00047	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	1031-07-8	Endosulfan sulfate	0.0012	UJ	MG/KG	0.00062	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	106-46-7	1,4-Dichlorobenzene	0.0029	UJ	MG/KG	0.0014	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	106-93-4	1,2-Dibromoethane	0.0036	UJ	MG/KG	0.0018	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	107-06-2	1,2-Dichloroethane	0.0044	UJ	MG/KG	0.0022	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	108-10-1	4-Methyl-2-pentanone	0.0071	UJ	MG/KG	0.0035	0.0222	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	108-87-2	Methylcyclohexane	0.0019	UJ	MG/KG	0.00095	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	108-88-3	Toluene	0.0013	UJ	MG/KG	0.00064	0.0044	8260B	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	108-90-7	Chlorobenzene	0.0016	UJ	MG/KG	0.00078	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	110-82-7	Cyclohexane	0.0044	UJ	MG/KG	0.0022	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	11096-82-5	Aroclor-1260	0.019	UJ	MG/KG	0.0095	0.047	8082	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	11097-69-1	Aroclor-1254	0.03	UJ	MG/KG	0.015	0.047	8082	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	11104-28-2	Aroclor-1221	0.037	UJ	MG/KG	0.019	0.047	8082	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	11141-16-5	Aroclor-1232	0.047	UJ	MG/KG	0.031	0.047	8082	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	120-12-7	Anthracene	0.0041	UJ	MG/KG	0.002	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	120-82-1	1,2,4-Trichlorobenzene	0.0028	UJ	MG/KG	0.0014	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	124-48-1	Dibromochloromethane	0.002	UJ	MG/KG	0.001	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	12672-29-6	Aroclor-1248	0.034	UJ	MG/KG	0.017	0.047	8082	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	12674-11-2	Aroclor-1016	0.04	UJ	MG/KG	0.02	0.047	8082	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	127-18-4	Tetrachloroethene	0.0041	UJ	MG/KG	0.0021	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	129-00-0	Pyrene	0.0073	J	MG/KG	0.002	0.0051	8270C_SIM	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	1330-20-7	Xylene, total	0.003	UJ	MG/KG	0.0015	0.0089	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	156-59-2	cis-1,2-Dichloroethene	0.0027	UJ	MG/KG	0.0014	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	156-60-5	trans-1,2-Dichloroethene	0.0017	UJ	MG/KG	0.00086	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0019	UJ	MG/KG	0.00095	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	18496-25-8	Sulfide	70	=	MG/KG	7	30	9031	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	18540-29-9	Chromium (hexavalent)	6.43	J	MG/KG	0.467	1.87	7196A	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	191-24-2	Benzo(g,h,i)perylene	0.0051	UJ	MG/KG	0.0047	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	193-39-5	Indeno(1,2,3-cd)pyrene	0.0051	UJ	MG/KG	0.0046	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	205-99-2	Benzo(b)fluoranthene	0.0107	J	MG/KG	0.0029	0.0051	8270C_SIM	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	206-44-0	Fluoranthene	0.0085	J	MG/KG	0.002	0.0051	8270C_SIM	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	207-08-9	Benzo(k)fluoranthene	0.0042	J	MG/KG	0.0032	0.0051	8270C_SIM	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	208-96-8	Acenaphthylene	0.0041	UJ	MG/KG	0.002	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	218-01-9	Chrysene	0.0068	J	MG/KG	0.002	0.0051	8270C_SIM	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	309-00-2	Aldrin	0.00093	UJ	MG/KG	0.00047	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	319-84-6	alpha-BHC	0.0047	UJ	MG/KG	0.003	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	319-85-7	beta-BHC	0.00093	UJ	MG/KG	0.00047	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	319-86-8	delta-BHC	0.0017	UJ	MG/KG	0.00087	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	33213-65-9	Endosulfan II	0.0018	UJ	MG/KG	0.0009	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	50-29-3	4,4'-DDT	0.0024	UJ	MG/KG	0.0012	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	50-32-8	Benzo(a)pyrene	0.0067	J	MG/KG	0.0028	0.0051	8270C_SIM	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	5103-71-9	alpha-Chlordane	0.00099	UJ	MG/KG	0.0005	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	5103-74-2	gamma-Chlordane	0.001	UJ	MG/KG	0.00053	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	53469-21-9	Aroclor-1242	0.034	UJ	MG/KG	0.017	0.047	8082	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	53494-70-5	Endrin ketone	0.0013	UJ	MG/KG	0.00065	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	53-70-3	Dibenz(a,h)anthracene	0.0051	UJ	MG/KG	0.004	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	541-73-1	1,3-Dichlorobenzene	0.002	UJ	MG/KG	0.001	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	56-23-5	Carbon tetrachloride	0.0027	UJ	MG/KG	0.0013	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	56-55-3	Benzo(a)anthracene	0.0047	J	MG/KG	0.0021	0.0051	8270C_SIM	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	58-89-9	gamma-BHC (Lindane)	0.0012	UJ	MG/KG	0.00062	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	591-78-6	2-Hexanone	0.0058	UJ	MG/KG	0.0029	0.0222	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	60-57-1	Dieldrin	0.00099	UJ	MG/KG	0.0005	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	67-64-1	Acetone	0.112	J	MG/KG	0.0029	0.0222	8260B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	67-66-3	Chloroform	0.0024	UJ	MG/KG	0.0012	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	71-43-2	Benzene	0.0022	UJ	MG/KG	0.0011	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	71-55-6	1,1,1-Trichloroethane	0.0014	UJ	MG/KG	0.00071	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	72-20-8	Endrin	0.0016	UJ	MG/KG	0.00081	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	72-43-5	Methoxychlor	0.0017	UJ	MG/KG	0.00084	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	72-54-8	4,4'-DDD	0.0032	UJ	MG/KG	0.0016	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	72-55-9	4,4'-DDE	0.0017	UJ	MG/KG	0.00084	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7421-93-4	Endrin aldehyde	0.0022	UJ	MG/KG	0.0011	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7429-90-5	Aluminum	5460	J	MG/KG	21.1	111	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7439-89-6	Iron	6750	J	MG/KG	6.66	55.5	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7439-92-1	Lead	11.8	J	MG/KG	3.78	8.89	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7439-95-4	Magnesium	3580	J	MG/KG	32.2	111	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7439-96-5	Manganese	60.1	J	MG/KG	1.78	5.55	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7439-97-6	Mercury	0.0205	J	MG/KG	0.00414	0.0224	7471A	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-02-0	Nickel	3.55	UJ	MG/KG	1.78	5.55	6010B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-09-7	Potassium	1380	J	MG/KG	55.5	555	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-22-4	Silver	0.478	UJ	MG/KG	0.239	0.747	6010B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-23-5	Sodium	12400	J	MG/KG	111	333	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-28-0	Thallium	7.55	UJ	MG/KG	3.78	11.1	6010B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-36-0	Antimony	0.717	UJ	MG/KG	0.358	1.49	6010B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-38-2	Arsenic	1.2	J	MG/KG	0.62	0.84	6020	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-39-3	Barium	7.39	J	MG/KG	1.78	5.55	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-41-7	Beryllium	3.55	UJ	MG/KG	1.78	5.55	6010B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-43-9	Cadmium	0.903	J	MG/KG	0.555	5.55	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-47-3	Chromium	5.9	J	MG/KG	0.23	1.7	6020	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-48-4	Cobalt	1.77	J	MG/KG	0.555	5.55	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-50-8	Copper	13.6	J	MG/KG	1.78	5.55	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-62-2	Vanadium	17.6	J	MG/KG	1.78	5.55	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-66-6	Zinc	25.4	J	MG/KG	3.66	11.1	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7440-70-2	Calcium	93800	J	MG/KG	36.6	111	6010B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	74-83-9	Bromomethane	0.0044	UJ	MG/KG	0.0027	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	74-87-3	Chloromethane	0.0017	UJ	MG/KG	0.00084	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	74-97-5	Bromochloromethane	0.004	UJ	MG/KG	0.002	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-00-3	Chloroethane	0.0033	UJ	MG/KG	0.0016	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-01-4	Vinyl chloride	0.0027	UJ	MG/KG	0.0013	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-09-2	Methylene chloride	0.0053	UJ	MG/KG	0.0027	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-15-0	Carbon disulfide	0.0044	UJ	MG/KG	0.0033	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-25-2	Bromoform	0.002	UJ	MG/KG	0.001	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-27-4	Bromodichloromethane	0.0014	UJ	MG/KG	0.00071	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-34-3	1,1-Dichloroethane	0.0015	UJ	MG/KG	0.00075	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-35-4	1,1-Dichloroethene	0.0015	UJ	MG/KG	0.00075	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-69-4	Trichlorofluoromethane (Freon-11)	0.002	UJ	MG/KG	0.00098	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0027	UJ	MG/KG	0.0013	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.0028	UJ	MG/KG	0.0014	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	76-44-8	Heptachlor	0.0012	UJ	MG/KG	0.00062	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7664-41-7	Ammonia	60.3	=	MG/KG	0.372	1.86	350.1	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	7782-49-2	Selenium	0.84	UJ	MG/KG	0.25	4.2	6020	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	78-87-5	1,2-Dichloropropane	0.0028	UJ	MG/KG	0.0014	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	78-93-3	2-Butanone	0.0056	J	MG/KG	0.0031	0.0222	8260B	TRUE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	79-00-5	1,1,2-Trichloroethane	0.0036	UJ	MG/KG	0.0018	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	79-01-6	Trichloroethene	0.002	UJ	MG/KG	0.00098	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	79-20-9	Methyl acetate	0.0089	UJ	MG/KG	0.0044	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	79-34-5	1,1,2,2-Tetrachloroethane	0.0026	UJ	MG/KG	0.0013	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	8001-35-2	Toxaphene	0.16	UJ	MG/KG	0.1	0.16	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	83-32-9	Acenaphthene	0.0041	UJ	MG/KG	0.002	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	85-01-8	Phenanthrene	0.0041	UJ	MG/KG	0.002	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	86-73-7	Fluorene	0.0041	UJ	MG/KG	0.002	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	87-61-6	1,2,3-Trichlorobenzene	0.0027	UJ	MG/KG	0.0014	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	90-12-0	1-Methylnaphthalene	0.0041	UJ	MG/KG	0.002	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	91-20-3	Naphthalene	0.0041	UJ	MG/KG	0.002	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	91-57-6	2-Methylnaphthalene	0.0041	UJ	MG/KG	0.002	0.0051	8270C_SIM	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	95-50-1	1,2-Dichlorobenzene	0.0025	UJ	MG/KG	0.0012	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	959-98-8	Endosulfan I	0.0014	UJ	MG/KG	0.00068	0.0047	8081A	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	96-12-8	1,2-Dibromo-3-chloropropane	0.0111	UJ	MG/KG	0.0062	0.0111	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	98-82-8	Isopropylbenzene	0.0027	UJ	MG/KG	0.0013	0.0044	8260B	FALSE
VWW06-SD007	VWW06-SD007-0211	0	0.5	04-Feb-11	SD	TOC	Total organic carbon (TOC)	13000	J	MG/KG	24	63	9060	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	100-41-4	Ethylbenzene	0.0014	U	MG/KG	0.00072	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	100-42-5	Styrene	0.00058	U	MG/KG	0.00029	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	10061-01-5	cis-1,3-Dichloropropene	0.00088	U	MG/KG	0.00044	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	10061-02-6	trans-1,3-Dichloropropene	0.0021	U	MG/KG	0.001	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	1024-57-3	Heptachlor epoxide	0.0003	UJ	MG/KG	0.00015	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	1031-07-8	Endosulfan sulfate	0.0004	UJ	MG/KG	0.0002	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	106-46-7	1,4-Dichlorobenzene	0.0014	U	MG/KG	0.00068	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	106-93-4	1,2-Dibromoethane	0.0017	U	MG/KG	0.00086	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	107-06-2	1,2-Dichloroethane	0.0021	U	MG/KG	0.001	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	108-10-1	4-Methyl-2-pentanone	0.0033	U	MG/KG	0.0017	0.0104	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	108-87-2	Methylcyclohexane	0.0009	U	MG/KG	0.00045	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	108-88-3	Toluene	0.0006	U	MG/KG	0.0003	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	108-90-7	Chlorobenzene	0.00073	U	MG/KG	0.00036	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	110-82-7	Cyclohexane	0.0021	U	MG/KG	0.001	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	11096-82-5	Aroclor-1260	0.012	UJ	MG/KG	0.0061	0.03	8082	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	11097-69-1	Aroclor-1254	0.019	UJ	MG/KG	0.0095	0.03	8082	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	11104-28-2	Aroclor-1221	0.024	UJ	MG/KG	0.012	0.03	8082	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	11141-16-5	Aroclor-1232	0.03	UJ	MG/KG	0.02	0.03	8082	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	120-12-7	Anthracene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	120-82-1	1,2,4-Trichlorobenzene	0.0013	U	MG/KG	0.00066	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	124-48-1	Dibromochloromethane	0.00096	U	MG/KG	0.00048	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	12672-29-6	Aroclor-1248	0.022	UJ	MG/KG	0.011	0.03	8082	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	12674-11-2	Aroclor-1016	0.026	UJ	MG/KG	0.013	0.03	8082	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	127-18-4	Tetrachloroethene	0.002	J	MG/KG	0.00097	0.0021	8260B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	129-00-0	Pyrene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	1330-20-7	Xylene, total	0.0014	U	MG/KG	0.00071	0.0042	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	156-59-2	cis-1,2-Dichloroethene	0.0013	U	MG/KG	0.00065	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	156-60-5	trans-1,2-Dichloroethene	0.00081	U	MG/KG	0.00041	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0009	U	MG/KG	0.00045	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	18496-25-8	Sulfide	19	=	MG/KG	3.5	15	9031	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	18540-29-9	Chromium (hexavalent)	1.84	J	MG/KG	0.295	1.18	7196A	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	191-24-2	Benzo(g,h,i)perylene	0.0033	UJ	MG/KG	0.003	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	193-39-5	Indeno(1,2,3-cd)pyrene	0.0033	UJ	MG/KG	0.0029	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	205-99-2	Benzo(b)fluoranthene	0.0033	UJ	MG/KG	0.0019	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	206-44-0	Fluoranthene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	207-08-9	Benzo(k)fluoranthene	0.0033	UJ	MG/KG	0.002	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	208-96-8	Acenaphthylene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	218-01-9	Chrysene	0.0025	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	309-00-2	Aldrin	0.0003	UJ	MG/KG	0.00015	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	319-84-6	alpha-BHC	0.0015	UJ	MG/KG	0.00096	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	319-85-7	beta-BHC	0.0003	UJ	MG/KG	0.00015	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	319-86-8	delta-BHC	0.00056	UJ	MG/KG	0.00028	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	33213-65-9	Endosulfan II	0.00058	UJ	MG/KG	0.00029	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	50-29-3	4,4'-DDT	0.00076	UJ	MG/KG	0.00038	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	50-32-8	Benzo(a)pyrene	0.0033	UJ	MG/KG	0.0018	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	5103-71-9	alpha-Chlordane	0.00032	UJ	MG/KG	0.00016	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	5103-74-2	gamma-Chlordane	0.00034	UJ	MG/KG	0.00017	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	53469-21-9	Aroclor-1242	0.022	UJ	MG/KG	0.011	0.03	8082	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	53494-70-5	Endrin ketone	0.00042	UJ	MG/KG	0.00021	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	53-70-3	Dibenz(a,h)anthracene	0.0033	UJ	MG/KG	0.0025	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	541-73-1	1,3-Dichlorobenzene	0.00094	U	MG/KG	0.00047	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	56-23-5	Carbon tetrachloride	0.0012	U	MG/KG	0.00062	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	56-55-3	Benzo(a)anthracene	0.0027	UJ	MG/KG	0.0014	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	58-89-9	gamma-BHC (Lindane)	0.0004	UJ	MG/KG	0.0002	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	591-78-6	2-Hexanone	0.0027	U	MG/KG	0.0014	0.0104	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	60-57-1	Dieldrin	0.00032	UJ	MG/KG	0.00016	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	67-64-1	Acetone	0.0027	U	MG/KG	0.0014	0.0104	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	67-66-3	Chloroform	0.0011	U	MG/KG	0.00056	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	71-43-2	Benzene	0.001	U	MG/KG	0.00052	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	71-55-6	1,1,1-Trichloroethane	0.00067	U	MG/KG	0.00033	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	72-20-8	Endrin	0.00052	UJ	MG/KG	0.00026	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	72-43-5	Methoxychlor	0.00054	UJ	MG/KG	0.00027	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	72-54-8	4,4'-DDD	0.001	UJ	MG/KG	0.00051	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	72-55-9	4,4'-DDE	0.00054	UJ	MG/KG	0.00027	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7421-93-4	Endrin aldehyde	0.00072	UJ	MG/KG	0.00036	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7429-90-5	Aluminum	2120	J	MG/KG	16.9	89	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7439-89-6	Iron	3310	J	MG/KG	5.34	44.5	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7439-92-1	Lead	6.8	J	MG/KG	3.02	7.12	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7439-95-4	Magnesium	3110	J	MG/KG	25.8	89	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7439-96-5	Manganese	89.4	J	MG/KG	1.42	4.45	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7439-97-6	Mercury	0.00742	J	MG/KG	0.00248	0.0134	7471A	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-02-0	Nickel	2.85	UJ	MG/KG	1.42	4.45	6010B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-09-7	Potassium	699	J	MG/KG	44.5	445	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-22-4	Silver	0.304	UJ	MG/KG	0.152	0.475	6010B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-23-5	Sodium	10900	J	MG/KG	89	267	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-28-0	Thallium	6.05	UJ	MG/KG	3.02	8.9	6010B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-36-0	Antimony	0.456	UJ	MG/KG	0.228	0.951	6010B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-38-2	Arsenic	1.2	J	MG/KG	0.34	0.47	6020	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-39-3	Barium	10.3	J	MG/KG	1.42	4.45	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-41-7	Beryllium	2.85	UJ	MG/KG	1.42	4.45	6010B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-43-9	Cadmium	0.775	J	MG/KG	0.445	4.45	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-47-3	Chromium	3.3	J	MG/KG	0.13	0.93	6020	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-48-4	Cobalt	0.925	J	MG/KG	0.445	4.45	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-50-8	Copper	5.08	J	MG/KG	1.42	4.45	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-62-2	Vanadium	9.58	J	MG/KG	1.42	4.45	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-66-6	Zinc	11	J	MG/KG	2.94	8.9	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7440-70-2	Calcium	105000	J	MG/KG	29.4	89	6010B	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	74-83-9	Bromomethane	0.0021	U	MG/KG	0.0012	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	74-87-3	Chloromethane	0.00079	U	MG/KG	0.0004	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	74-97-5	Bromochloromethane	0.0019	U	MG/KG	0.00094	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-00-3	Chloroethane	0.0015	U	MG/KG	0.00077	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-01-4	Vinyl chloride	0.0012	U	MG/KG	0.00062	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-09-2	Methylene chloride	0.0025	U	MG/KG	0.0012	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-15-0	Carbon disulfide	0.0021	U	MG/KG	0.0016	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-25-2	Bromoform	0.00096	U	MG/KG	0.00048	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-27-4	Bromodichloromethane	0.00067	U	MG/KG	0.00033	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-34-3	1,1-Dichloroethane	0.00071	U	MG/KG	0.00035	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-35-4	1,1-Dichloroethene	0.00071	U	MG/KG	0.00035	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-69-4	Trichlorofluoromethane (Freon-11)	0.00092	U	MG/KG	0.00046	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0012	U	MG/KG	0.00062	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.0013	U	MG/KG	0.00066	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	76-44-8	Heptachlor	0.0004	UJ	MG/KG	0.0002	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7664-41-7	Ammonia	27.2	=	MG/KG	0.24	1.2	350.1	TRUE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	7782-49-2	Selenium	0.47	UJ	MG/KG	0.14	2.3	6020	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	78-87-5	1,2-Dichloropropane	0.0013	U	MG/KG	0.00066	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	78-93-3	2-Butanone	0.0029	U	MG/KG	0.0014	0.0104	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	79-00-5	1,1,2-Trichloroethane	0.0017	U	MG/KG	0.00086	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	79-01-6	Trichloroethene	0.00092	U	MG/KG	0.00046	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	79-20-9	Methyl acetate	0.0042	U	MG/KG	0.0021	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	79-34-5	1,1,2,2-Tetrachloroethane	0.0012	U	MG/KG	0.00062	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	8001-35-2	Toxaphene	0.05	UJ	MG/KG	0.033	0.05	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	83-32-9	Acenaphthene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	85-01-8	Phenanthrene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	86-73-7	Fluorene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	87-61-6	1,2,3-Trichlorobenzene	0.0013	U	MG/KG	0.00064	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	90-12-0	1-Methylnaphthalene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	91-20-3	Naphthalene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	91-57-6	2-Methylnaphthalene	0.0026	UJ	MG/KG	0.0013	0.0033	8270C_SIM	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	95-50-1	1,2-Dichlorobenzene	0.0012	U	MG/KG	0.00058	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	959-98-8	Endosulfan I	0.00044	UJ	MG/KG	0.00022	0.0015	8081A	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	96-12-8	1,2-Dibromo-3-chloropropane	0.0052	U	MG/KG	0.0029	0.0052	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	98-82-8	Isopropylbenzene	0.0012	U	MG/KG	0.00062	0.0021	8260B	FALSE
VWW06-SD008	VWW06-SD008-0211	0	0.5	04-Feb-11	SS	TOC	Total organic carbon (TOC)	7500	=	MG/KG	24	63	9060	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	100-41-4	Ethylbenzene	0.0048	UJ	MG/KG	0.0024	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	100-42-5	Styrene	0.002	UJ	MG/KG	0.00098	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	10061-01-5	cis-1,3-Dichloropropene	0.0029	UJ	MG/KG	0.0015	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	10061-02-6	trans-1,3-Dichloropropene	0.007	UJ	MG/KG	0.0035	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	1024-57-3	Heptachlor epoxide	0.0015	UJ	MG/KG	0.00074	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	1031-07-8	Endosulfan sulfate	0.002	UJ	MG/KG	0.00098	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	106-46-7	1,4-Dichlorobenzene	0.0046	UJ	MG/KG	0.0023	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	106-93-4	1,2-Dibromoethane	0.0057	UJ	MG/KG	0.0029	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	107-06-2	1,2-Dichloroethane	0.007	UJ	MG/KG	0.0035	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	108-10-1	4-Methyl-2-pentanone	0.0112	UJ	MG/KG	0.0056	0.035	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	108-87-2	Methylcyclohexane	0.003	UJ	MG/KG	0.0015	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	108-88-3	Toluene	0.002	UJ	MG/KG	0.001	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	108-90-7	Chlorobenzene	0.0024	UJ	MG/KG	0.0012	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	110-82-7	Cyclohexane	0.007	UJ	MG/KG	0.0035	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	11096-82-5	Aroclor-1260	0.03	UJ	MG/KG	0.015	0.074	8082	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	11097-69-1	Aroclor-1254	0.26	J	MG/KG	0.023	0.074	8082	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	11104-28-2	Aroclor-1221	0.059	UJ	MG/KG	0.03	0.074	8082	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	11141-16-5	Aroclor-1232	0.074	UJ	MG/KG	0.049	0.074	8082	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	120-12-7	Anthracene	0.0331	UJ	MG/KG	0.0166	0.0415	8270C_SIM	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	120-82-1	1,2,4-Trichlorobenzene	0.0044	UJ	MG/KG	0.0022	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	124-48-1	Dibromochloromethane	0.0032	UJ	MG/KG	0.0016	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	12672-29-6	Aroclor-1248	0.054	UJ	MG/KG	0.027	0.074	8082	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	12674-11-2	Aroclor-1016	0.064	UJ	MG/KG	0.032	0.074	8082	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	127-18-4	Tetrachloroethene	0.0065	UJ	MG/KG	0.0032	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	129-00-0	Pyrene	0.108	J	MG/KG	0.0166	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	1330-20-7	Xylene, total	0.0048	UJ	MG/KG	0.0024	0.014	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	156-59-2	cis-1,2-Dichloroethene	0.0043	UJ	MG/KG	0.0022	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	156-60-5	trans-1,2-Dichloroethene	0.0027	UJ	MG/KG	0.0014	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.003	UJ	MG/KG	0.0015	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	18496-25-8	Sulfide	54	=	MG/KG	7	30	9031	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	18540-29-9	Chromium (hexavalent)	12	J	MG/KG	0.793	3.17	7196A	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	191-24-2	Benzo(g,h,i)perylene	0.0588	J	MG/KG	0.0386	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	193-39-5	Indeno(1,2,3-cd)pyrene	0.0555	J	MG/KG	0.0374	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	205-99-2	Benzo(b)fluoranthene	0.155	J	MG/KG	0.0237	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	206-44-0	Fluoranthene	0.0926	J	MG/KG	0.0166	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	207-08-9	Benzo(k)fluoranthene	0.0597	J	MG/KG	0.0262	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	208-96-8	Acenaphthylene	0.0331	UJ	MG/KG	0.0166	0.0415	8270C_SIM	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	218-01-9	Chrysene	0.0863	J	MG/KG	0.0162	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	309-00-2	Aldrin	0.0015	UJ	MG/KG	0.00074	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	319-84-6	alpha-BHC	0.0074	UJ	MG/KG	0.0047	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	319-85-7	beta-BHC	0.0015	UJ	MG/KG	0.00074	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	319-86-8	delta-BHC	0.0028	UJ	MG/KG	0.0014	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	33213-65-9	Endosulfan II	0.0028	UJ	MG/KG	0.0014	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	50-29-3	4,4'-DDT	0.0037	UJ	MG/KG	0.0019	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	50-32-8	Benzo(a)pyrene	0.0967	J	MG/KG	0.0224	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	5103-71-9	alpha-Chlordane	0.0016	UJ	MG/KG	0.00079	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	5103-74-2	gamma-Chlordane	0.0017	UJ	MG/KG	0.00084	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	53469-21-9	Aroclor-1242	0.054	UJ	MG/KG	0.027	0.074	8082	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	53494-70-5	Endrin ketone	0.0021	UJ	MG/KG	0.001	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	53-70-3	Dibenz(a,h)anthracene	0.0415	UJ	MG/KG	0.0324	0.0415	8270C_SIM	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	541-73-1	1,3-Dichlorobenzene	0.0032	UJ	MG/KG	0.0016	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	56-23-5	Carbon tetrachloride	0.0042	UJ	MG/KG	0.0021	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	56-55-3	Benzo(a)anthracene	0.0632	J	MG/KG	0.0174	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	58-89-9	gamma-BHC (Lindane)	0.002	UJ	MG/KG	0.00098	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	591-78-6	2-Hexanone	0.0091	UJ	MG/KG	0.0046	0.035	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	60-57-1	Dieldrin	0.0016	UJ	MG/KG	0.00079	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	67-64-1	Acetone	0.158	J	MG/KG	0.0046	0.035	8260B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	67-66-3	Chloroform	0.0038	UJ	MG/KG	0.0019	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	71-43-2	Benzene	0.0035	UJ	MG/KG	0.0018	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	71-55-6	1,1,1-Trichloroethane	0.0022	UJ	MG/KG	0.0011	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	72-20-8	Endrin	0.0026	UJ	MG/KG	0.0013	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	72-43-5	Methoxychlor	0.0027	UJ	MG/KG	0.0013	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	72-54-8	4,4'-DDD	0.034	J	MG/KG	0.0025	0.0074	8081A	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	72-55-9	4,4'-DDE	0.066	J	MG/KG	0.0013	0.0074	8081A	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7421-93-4	Endrin aldehyde	0.0035	UJ	MG/KG	0.0018	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7429-90-5	Aluminum	14400	J	MG/KG	29.7	156	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7439-89-6	Iron	45900	J	MG/KG	9.39	78.3	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7439-92-1	Lead	612	J	MG/KG	5.32	12.5	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7439-95-4	Magnesium	11900	J	MG/KG	45.4	156	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7439-96-5	Manganese	356	J	MG/KG	2.5	7.83	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7439-97-6	Mercury	0.129	J	MG/KG	0.00652	0.0352	7471A	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-02-0	Nickel	19.1	J	MG/KG	2.5	7.83	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-09-7	Potassium	3450	J	MG/KG	78.3	783	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-22-4	Silver	0.787	UJ	MG/KG	0.394	1.23	6010B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-23-5	Sodium	27800	J	MG/KG	156	470	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-28-0	Thallium	10.6	UJ	MG/KG	5.32	15.6	6010B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-36-0	Antimony	2.2	J	MG/KG	0.59	2.46	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-38-2	Arsenic	7.8	J	MG/KG	1	1.4	6020	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-39-3	Barium	33.8	J	MG/KG	2.5	7.83	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-41-7	Beryllium	5.01	UJ	MG/KG	2.5	7.83	6010B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-43-9	Cadmium	5.69	J	MG/KG	0.783	7.83	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-47-3	Chromium	37	J	MG/KG	0.39	2.8	6020	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-48-4	Cobalt	9	J	MG/KG	0.783	7.83	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-50-8	Copper	204	J	MG/KG	2.5	7.83	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-62-2	Vanadium	66.1	J	MG/KG	2.5	7.83	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-66-6	Zinc	849	J	MG/KG	5.17	15.6	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7440-70-2	Calcium	72900	J	MG/KG	51.7	156	6010B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	74-83-9	Bromomethane	0.007	UJ	MG/KG	0.0042	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	74-87-3	Chloromethane	0.0027	UJ	MG/KG	0.0013	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	74-97-5	Bromochloromethane	0.0063	UJ	MG/KG	0.0032	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-00-3	Chloroethane	0.0052	UJ	MG/KG	0.0026	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-01-4	Vinyl chloride	0.0042	UJ	MG/KG	0.0021	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-09-2	Methylene chloride	0.0084	UJ	MG/KG	0.0042	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-15-0	Carbon disulfide	0.013	J	MG/KG	0.0052	0.007	8260B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-25-2	Bromoform	0.0032	UJ	MG/KG	0.0016	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-27-4	Bromodichloromethane	0.0022	UJ	MG/KG	0.0011	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-34-3	1,1-Dichloroethane	0.0024	UJ	MG/KG	0.0012	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-35-4	1,1-Dichloroethene	0.0024	UJ	MG/KG	0.0012	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-69-4	Trichlorofluoromethane (Freon-11)	0.0031	UJ	MG/KG	0.0015	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0042	UJ	MG/KG	0.0021	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.0044	UJ	MG/KG	0.0022	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	76-44-8	Heptachlor	0.002	UJ	MG/KG	0.00098	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7664-41-7	Ammonia	141	=	MG/KG	0.572	2.86	350.1	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	7782-49-2	Selenium	1.4	UJ	MG/KG	0.42	7	6020	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	78-87-5	1,2-Dichloropropane	0.0044	UJ	MG/KG	0.0022	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	78-93-3	2-Butanone	0.0473	J	MG/KG	0.0049	0.035	8260B	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	79-00-5	1,1,2-Trichloroethane	0.0057	UJ	MG/KG	0.0029	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	79-01-6	Trichloroethene	0.0031	UJ	MG/KG	0.0015	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	79-20-9	Methyl acetate	0.014	UJ	MG/KG	0.007	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	79-34-5	1,1,2,2-Tetrachloroethane	0.0041	UJ	MG/KG	0.0021	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	8001-35-2	Toxaphene	0.25	UJ	MG/KG	0.16	0.25	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	83-32-9	Acenaphthene	0.0331	UJ	MG/KG	0.0166	0.0415	8270C_SIM	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	85-01-8	Phenanthrene	0.026	J	MG/KG	0.0166	0.0415	8270C_SIM	TRUE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	86-73-7	Fluorene	0.0331	UJ	MG/KG	0.0166	0.0415	8270C_SIM	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	87-61-6	1,2,3-Trichlorobenzene	0.0043	UJ	MG/KG	0.0021	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	90-12-0	1-Methylnaphthalene	0.0331	UJ	MG/KG	0.0166	0.0415	8270C_SIM	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	91-20-3	Naphthalene	0.0331	UJ	MG/KG	0.0166	0.0415	8270C_SIM	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	91-57-6	2-Methylnaphthalene	0.0331	UJ	MG/KG	0.0166	0.0415	8270C_SIM	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	95-50-1	1,2-Dichlorobenzene	0.0039	UJ	MG/KG	0.002	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	959-98-8	Endosulfan I	0.0022	UJ	MG/KG	0.0011	0.0074	8081A	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	96-12-8	1,2-Dibromo-3-chloropropane	0.0175	UJ	MG/KG	0.0098	0.0175	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	98-82-8	Isopropylbenzene	0.0042	UJ	MG/KG	0.0021	0.007	8260B	FALSE
VWW06-SD009	VWW06-SD009-0211	0	0.5	04-Feb-11	SD	TOC	Total organic carbon (TOC)	24000	J	MG/KG	18	47	9060	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	100-41-4	Ethylbenzene	0.002	U	MG/KG	0.00098	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	100-42-5	Styrene	0.00079	U	MG/KG	0.0004	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	10061-01-5	cis-1,3-Dichloropropene	0.0012	U	MG/KG	0.0006	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	10061-02-6	trans-1,3-Dichloropropene	0.0028	U	MG/KG	0.0014	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	1024-57-3	Heptachlor epoxide	0.00077	UJ	MG/KG	0.00039	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	1031-07-8	Endosulfan sulfate	0.001	UJ	MG/KG	0.00051	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	106-46-7	1,4-Dichlorobenzene	0.0018	U	MG/KG	0.00092	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	106-93-4	1,2-Dibromoethane	0.0023	U	MG/KG	0.0012	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	107-06-2	1,2-Dichloroethane	0.0028	U	MG/KG	0.0014	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	108-10-1	4-Methyl-2-pentanone	0.0045	U	MG/KG	0.0023	0.0142	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	108-87-2	Methylcyclohexane	0.0012	U	MG/KG	0.00061	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	108-88-3	Toluene	0.00082	U	MG/KG	0.00041	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	108-90-7	Chlorobenzene	0.00099	U	MG/KG	0.0005	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	110-82-7	Cyclohexane	0.0028	U	MG/KG	0.0014	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	11096-82-5	Aroclor-1260	0.016	UJ	MG/KG	0.0078	0.039	8082	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	11097-69-1	Aroclor-1254	0.048	J	MG/KG	0.012	0.039	8082	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	11104-28-2	Aroclor-1221	0.031	UJ	MG/KG	0.015	0.039	8082	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	11141-16-5	Aroclor-1232	0.039	UJ	MG/KG	0.026	0.039	8082	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	120-12-7	Anthracene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	120-82-1	1,2,4-Trichlorobenzene	0.0018	U	MG/KG	0.00089	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	124-48-1	Dibromochloromethane	0.0013	U	MG/KG	0.00065	0.0028	8260B	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	12672-29-6	Aroclor-1248	0.028	UJ	MG/KG	0.014	0.039	8082	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	12674-11-2	Aroclor-1016	0.033	UJ	MG/KG	0.017	0.039	8082	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	127-18-4	Tetrachloroethene	0.0016	J	MG/KG	0.0013	0.0028	8260B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	129-00-0	Pyrene	0.0328	J	MG/KG	0.0085	0.0213	8270C_SIM	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	1330-20-7	Xylene, total	0.0019	U	MG/KG	0.00096	0.0057	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	156-59-2	cis-1,2-Dichloroethene	0.0018	U	MG/KG	0.00088	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	156-60-5	trans-1,2-Dichloroethene	0.0011	U	MG/KG	0.00055	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0012	U	MG/KG	0.00061	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	18496-25-8	Sulfide	89	=	MG/KG	7	30	9031	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	18540-29-9	Chromium (hexavalent)	1.92	J	MG/KG	0.387	1.55	7196A	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	191-24-2	Benzo(g,h,i)perylene	0.0213	UJ	MG/KG	0.0199	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	193-39-5	Indeno(1,2,3-cd)pyrene	0.0213	UJ	MG/KG	0.0192	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	205-99-2	Benzo(b)fluoranthene	0.0361	J	MG/KG	0.0122	0.0213	8270C_SIM	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	206-44-0	Fluoranthene	0.0252	J	MG/KG	0.0085	0.0213	8270C_SIM	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	207-08-9	Benzo(k)fluoranthene	0.0151	J	MG/KG	0.0134	0.0213	8270C_SIM	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	208-96-8	Acenaphthylene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	218-01-9	Chrysene	0.0182	J	MG/KG	0.0083	0.0213	8270C_SIM	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	309-00-2	Aldrin	0.00077	UJ	MG/KG	0.00039	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	319-84-6	alpha-BHC	0.0039	UJ	MG/KG	0.0025	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	319-85-7	beta-BHC	0.00077	UJ	MG/KG	0.00039	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	319-86-8	delta-BHC	0.0014	UJ	MG/KG	0.00072	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	33213-65-9	Endosulfan II	0.0015	UJ	MG/KG	0.00075	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	50-29-3	4,4'-DDT	0.002	UJ	MG/KG	0.00098	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	50-32-8	Benzo(a)pyrene	0.0252	J	MG/KG	0.0115	0.0213	8270C_SIM	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	5103-71-9	alpha-Chlordane	0.00082	UJ	MG/KG	0.00041	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	5103-74-2	gamma-Chlordane	0.00088	UJ	MG/KG	0.00044	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	53469-21-9	Aroclor-1242	0.028	UJ	MG/KG	0.014	0.039	8082	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	53494-70-5	Endrin ketone	0.0011	UJ	MG/KG	0.00054	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	53-70-3	Dibenz(a,h)anthracene	0.0213	UJ	MG/KG	0.0167	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	541-73-1	1,3-Dichlorobenzene	0.0013	U	MG/KG	0.00064	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	56-23-5	Carbon tetrachloride	0.0017	U	MG/KG	0.00085	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	56-55-3	Benzo(a)anthracene	0.0202	J	MG/KG	0.009	0.0213	8270C_SIM	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	58-89-9	gamma-BHC (Lindane)	0.001	UJ	MG/KG	0.00051	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	591-78-6	2-Hexanone	0.0037	U	MG/KG	0.0018	0.0142	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	60-57-1	Dieldrin	0.00082	UJ	MG/KG	0.00041	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	67-64-1	Acetone	0.07	=	MG/KG	0.0018	0.0142	8260B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	67-66-3	Chloroform	0.0015	U	MG/KG	0.00077	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	71-43-2	Benzene	0.0014	U	MG/KG	0.00071	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	71-55-6	1,1,1-Trichloroethane	0.00091	U	MG/KG	0.00045	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	72-20-8	Endrin	0.0013	UJ	MG/KG	0.00067	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	72-43-5	Methoxychlor	0.0014	UJ	MG/KG	0.00069	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	72-54-8	4,4'-DDD	0.0054	J	MG/KG	0.0013	0.0039	8081A	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	72-55-9	4,4'-DDE	0.0075	J	MG/KG	0.00069	0.0039	8081A	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7421-93-4	Endrin aldehyde	0.0018	UJ	MG/KG	0.00093	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7429-90-5	Aluminum	6030	J	MG/KG	16.2	85.4	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7439-89-6	Iron	18600	J	MG/KG	5.12	42.7	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7439-92-1	Lead	134	J	MG/KG	2.9	6.83	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7439-95-4	Magnesium	4100	J	MG/KG	24.8	85.4	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7439-96-5	Manganese	164	J	MG/KG	1.36	4.27	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7439-97-6	Mercury	0.0554	J	MG/KG	0.00338	0.0183	7471A	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-02-0	Nickel	6.66	J	MG/KG	1.36	4.27	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-09-7	Potassium	1170	J	MG/KG	42.7	427	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-22-4	Silver	0.368	UJ	MG/KG	0.184	0.574	6010B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-23-5	Sodium	8010	J	MG/KG	85.4	256	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-28-0	Thallium	5.8	UJ	MG/KG	2.9	8.54	6010B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-36-0	Antimony	0.396	J	MG/KG	0.276	1.15	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-38-2	Arsenic	4.4	J	MG/KG	0.42	0.57	6020	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-39-3	Barium	14.8	J	MG/KG	1.36	4.27	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-41-7	Beryllium	2.73	UJ	MG/KG	1.36	4.27	6010B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-43-9	Cadmium	1.62	J	MG/KG	0.427	4.27	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-47-3	Chromium	19.3	J	MG/KG	0.16	1.1	6020	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-48-4	Cobalt	3.81	J	MG/KG	0.427	4.27	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-50-8	Copper	56.9	J	MG/KG	1.36	4.27	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-62-2	Vanadium	29.8	J	MG/KG	1.36	4.27	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-66-6	Zinc	164	J	MG/KG	2.82	8.54	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7440-70-2	Calcium	110000	J	MG/KG	28.2	85.4	6010B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	74-83-9	Bromomethane	0.0028	U	MG/KG	0.0017	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	74-87-3	Chloromethane	0.0011	U	MG/KG	0.00054	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	74-97-5	Bromochloromethane	0.0026	U	MG/KG	0.0013	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-00-3	Chloroethane	0.0021	U	MG/KG	0.001	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-01-4	Vinyl chloride	0.0017	U	MG/KG	0.00085	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-09-2	Methylene chloride	0.0034	U	MG/KG	0.0017	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-15-0	Carbon disulfide	0.0028	U	MG/KG	0.0021	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-25-2	Bromoform	0.0013	U	MG/KG	0.00065	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-27-4	Bromodichloromethane	0.00091	U	MG/KG	0.00045	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-34-3	1,1-Dichloroethane	0.00096	U	MG/KG	0.00048	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-35-4	1,1-Dichloroethene	0.00096	U	MG/KG	0.00048	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-69-4	Trichlorofluoromethane (Freon-11)	0.0012	U	MG/KG	0.00062	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0017	U	MG/KG	0.00085	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.0018	U	MG/KG	0.00089	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	76-44-8	Heptachlor	0.001	UJ	MG/KG	0.00051	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7664-41-7	Ammonia	40.4	=	MG/KG	0.302	1.51	350.1	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	7782-49-2	Selenium	0.57	UJ	MG/KG	0.17	2.9	6020	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	78-87-5	1,2-Dichloropropane	0.0018	U	MG/KG	0.00089	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	78-93-3	2-Butanone	0.0139	J	MG/KG	0.002	0.0142	8260B	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	79-00-5	1,1,2-Trichloroethane	0.0023	U	MG/KG	0.0012	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	79-01-6	Trichloroethene	0.0012	U	MG/KG	0.00062	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	79-20-9	Methyl acetate	0.0057	U	MG/KG	0.0028	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	79-34-5	1,1,2,2-Tetrachloroethane	0.0017	U	MG/KG	0.00084	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	8001-35-2	Toxaphene	0.13	UJ	MG/KG	0.086	0.13	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	83-32-9	Acenaphthene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	85-01-8	Phenanthrene	0.0087	J	MG/KG	0.0085	0.0213	8270C_SIM	TRUE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	86-73-7	Fluorene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	87-61-6	1,2,3-Trichlorobenzene	0.0017	U	MG/KG	0.00086	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	90-12-0	1-Methylnaphthalene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	91-20-3	Naphthalene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	91-57-6	2-Methylnaphthalene	0.017	UJ	MG/KG	0.0085	0.0213	8270C_SIM	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	95-50-1	1,2-Dichlorobenzene	0.0016	U	MG/KG	0.00079	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	959-98-8	Endosulfan I	0.0011	UJ	MG/KG	0.00057	0.0039	8081A	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	96-12-8	1,2-Dibromo-3-chloropropane	0.0071	U	MG/KG	0.004	0.0071	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	98-82-8	Isopropylbenzene	0.0017	U	MG/KG	0.00085	0.0028	8260B	FALSE
VWW06-SD010	VWW06-SD010-0211	0	0.6	04-Feb-11	SD	TOC	Total organic carbon (TOC)	6700	=	MG/KG	28	72	9060	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	100-41-4	Ethylbenzene	0.0013	U	MG/KG	0.00064	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	100-42-5	Styrene	0.00052	UJ	MG/KG	0.00026	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	10061-01-5	cis-1,3-Dichloropropene	0.00078	UJ	MG/KG	0.00039	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	10061-02-6	trans-1,3-Dichloropropene	0.0019	U	MG/KG	0.00093	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	1024-57-3	Heptachlor epoxide	0.00026	UJ	MG/KG	0.00013	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	1031-07-8	Endosulfan sulfate	0.00034	UJ	MG/KG	0.00017	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	106-46-7	1,4-Dichlorobenzene	0.0012	U	MG/KG	0.0006	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	106-93-4	1,2-Dibromoethane	0.0015	UJ	MG/KG	0.00076	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	107-06-2	1,2-Dichloroethane	0.0019	U	MG/KG	0.00093	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	108-10-1	4-Methyl-2-pentanone	0.003	UJ	MG/KG	0.0015	0.0093	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	108-87-2	Methylcyclohexane	0.0008	UJ	MG/KG	0.0004	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	108-88-3	Toluene	0.00054	UJ	MG/KG	0.00027	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	108-90-7	Chlorobenzene	0.00065	UJ	MG/KG	0.00032	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	110-82-7	Cyclohexane	0.0019	U	MG/KG	0.00093	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	11096-82-5	Aroclor-1260	0.01	UJ	MG/KG	0.0052	0.026	8082	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	11097-69-1	Aroclor-1254	0.12	J	MG/KG	0.0081	0.026	8082	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	11104-28-2	Aroclor-1221	0.02	UJ	MG/KG	0.01	0.026	8082	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	11141-16-5	Aroclor-1232	0.026	UJ	MG/KG	0.017	0.026	8082	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	120-12-7	Anthracene	0.0113	UJ	MG/KG	0.0057	0.0142	8270C_SIM	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	120-82-1	1,2,4-Trichlorobenzene	0.0012	U	MG/KG	0.00058	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	124-48-1	Dibromochloromethane	0.00086	UJ	MG/KG	0.00043	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	12672-29-6	Aroclor-1248	0.019	UJ	MG/KG	0.0094	0.026	8082	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	12674-11-2	Aroclor-1016	0.022	UJ	MG/KG	0.011	0.026	8082	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	127-18-4	Tetrachloroethene	0.002	J	MG/KG	0.00086	0.0019	8260B	TRUE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	129-00-0	Pyrene	0.0388	J	MG/KG	0.0057	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	1330-20-7	Xylene, total	0.0013	U	MG/KG	0.00063	0.0037	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	156-59-2	cis-1,2-Dichloroethene	0.0012	U	MG/KG	0.00058	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	156-60-5	trans-1,2-Dichloroethene	0.00072	UJ	MG/KG	0.00036	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0008	UJ	MG/KG	0.0004	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	18496-25-8	Sulfide	33	=	MG/KG	7	30	9031	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	18540-29-9	Chromium (hexavalent)	2.38	J	MG/KG	0.26	1.04	7196A	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	191-24-2	Benzo(g,h,i)perylene	0.0172	J	MG/KG	0.0132	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	193-39-5	Indeno(1,2,3-cd)pyrene	0.0168	J	MG/KG	0.0128	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	205-99-2	Benzo(b)fluoranthene	0.0412	J	MG/KG	0.0081	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	206-44-0	Fluoranthene	0.0436	J	MG/KG	0.0057	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	207-08-9	Benzo(k)fluoranthene	0.0152	J	MG/KG	0.0089	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	208-96-8	Acenaphthylene	0.0113	UJ	MG/KG	0.0057	0.0142	8270C_SIM	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	218-01-9	Chrysene	0.0265	J	MG/KG	0.0055	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	309-00-2	Aldrin	0.00026	UJ	MG/KG	0.00013	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	319-84-6	alpha-BHC	0.0013	UJ	MG/KG	0.00082	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	319-85-7	beta-BHC	0.00026	UJ	MG/KG	0.00013	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	319-86-8	delta-BHC	0.00048	UJ	MG/KG	0.00024	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	33213-65-9	Endosulfan II	0.00049	UJ	MG/KG	0.00025	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	50-29-3	4,4'-DDT	0.007	J	MG/KG	0.00032	0.0013	8081A	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	50-32-8	Benzo(a)pyrene	0.0291	J	MG/KG	0.0077	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	5103-71-9	alpha-Chlordane	0.00027	UJ	MG/KG	0.00014	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	5103-74-2	gamma-Chlordane	0.00029	UJ	MG/KG	0.00014	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	53469-21-9	Aroclor-1242	0.019	UJ	MG/KG	0.0094	0.026	8082	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	53494-70-5	Endrin ketone	0.00036	UJ	MG/KG	0.00018	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	53-70-3	Dibenz(a,h)anthracene	0.0142	UJ	MG/KG	0.0111	0.0142	8270C_SIM	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	541-73-1	1,3-Dichlorobenzene	0.00084	UJ	MG/KG	0.00042	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	56-23-5	Carbon tetrachloride	0.0011	UJ	MG/KG	0.00056	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	56-55-3	Benzo(a)anthracene	0.0306	J	MG/KG	0.006	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	58-89-9	gamma-BHC (Lindane)	0.00034	UJ	MG/KG	0.00017	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	591-78-6	2-Hexanone	0.0024	UJ	MG/KG	0.0012	0.0093	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	60-57-1	Dieldrin	0.00027	UJ	MG/KG	0.00014	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	67-64-1	Acetone	0.0046	J	MG/KG	0.0012	0.0093	8260B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	67-66-3	Chloroform	0.001	U	MG/KG	0.0005	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	71-43-2	Benzene	0.00093	UJ	MG/KG	0.00046	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	71-55-6	1,1,1-Trichloroethane	0.0006	UJ	MG/KG	0.0003	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	72-20-8	Endrin	0.00044	UJ	MG/KG	0.00022	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	72-43-5	Methoxychlor	0.00046	UJ	MG/KG	0.00023	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	72-54-8	4,4'-DDD	0.0017	J	MG/KG	0.00043	0.0013	8081A	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	72-55-9	4,4'-DDE	0.016	J	MG/KG	0.00023	0.0013	8081A	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7421-93-4	Endrin aldehyde	0.00061	UJ	MG/KG	0.00031	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7429-90-5	Aluminum	5610	J	MG/KG	15.4	81	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7439-89-6	Iron	11900	J	MG/KG	4.86	40.5	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7439-92-1	Lead	12.7	J	MG/KG	2.75	6.48	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7439-95-4	Magnesium	5380	J	MG/KG	23.5	81	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7439-96-5	Manganese	247	J	MG/KG	1.3	4.05	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7439-97-6	Mercury	0.0106	J	MG/KG	0.00287	0.0155	7471A	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-02-0	Nickel	3.56	J	MG/KG	1.3	4.05	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-09-7	Potassium	874	J	MG/KG	40.5	405	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-22-4	Silver	0.301	UJ	MG/KG	0.151	0.471	6010B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-23-5	Sodium	5390	J	MG/KG	81	243	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-28-0	Thallium	5.5	UJ	MG/KG	2.75	8.1	6010B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-36-0	Antimony	0.452	UJ	MG/KG	0.226	0.942	6010B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-38-2	Arsenic	1.2	J	MG/KG	0.32	0.43	6020	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-39-3	Barium	49.8	J	MG/KG	1.3	4.05	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-41-7	Beryllium	2.59	UJ	MG/KG	1.3	4.05	6010B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-43-9	Cadmium	0.5	J	MG/KG	0.405	4.05	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-47-3	Chromium	6.6	J	MG/KG	0.12	0.86	6020	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-48-4	Cobalt	4.05	J	MG/KG	0.405	4.05	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-50-8	Copper	72	J	MG/KG	1.3	4.05	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-62-2	Vanadium	35	J	MG/KG	1.3	4.05	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-66-6	Zinc	58	J	MG/KG	2.67	8.1	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7440-70-2	Calcium	107000	J	MG/KG	26.7	81	6010B	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	74-83-9	Bromomethane	0.0019	U	MG/KG	0.0011	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	74-87-3	Chloromethane	0.00071	UJ	MG/KG	0.00035	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	74-97-5	Bromochloromethane	0.0017	U	MG/KG	0.00084	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-00-3	Chloroethane	0.0014	U	MG/KG	0.00069	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-01-4	Vinyl chloride	0.0011	UJ	MG/KG	0.00056	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-09-2	Methylene chloride	0.0022	UJ	MG/KG	0.0011	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-15-0	Carbon disulfide	0.0019	U	MG/KG	0.0014	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-25-2	Bromoform	0.00086	UJ	MG/KG	0.00043	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-27-4	Bromodichloromethane	0.0006	UJ	MG/KG	0.0003	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-34-3	1,1-Dichloroethane	0.00063	UJ	MG/KG	0.00032	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-35-4	1,1-Dichloroethene	0.00063	UJ	MG/KG	0.00032	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-69-4	Trichlorofluoromethane (Freon-11)	0.00082	UJ	MG/KG	0.00041	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0011	UJ	MG/KG	0.00056	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.0012	U	MG/KG	0.00058	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	76-44-8	Heptachlor	0.00034	UJ	MG/KG	0.00017	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7664-41-7	Ammonia	37.7	=	MG/KG	0.19	0.952	350.1	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	7782-49-2	Selenium	0.43	UJ	MG/KG	0.13	2.1	6020	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	78-87-5	1,2-Dichloropropane	0.0012	U	MG/KG	0.00058	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	78-93-3	2-Butanone	0.0026	UJ	MG/KG	0.0013	0.0093	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	79-00-5	1,1,2-Trichloroethane	0.0015	UJ	MG/KG	0.00076	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	79-01-6	Trichloroethene	0.00082	UJ	MG/KG	0.00041	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	79-20-9	Methyl acetate	0.0037	UJ	MG/KG	0.0019	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	79-34-5	1,1,2,2-Tetrachloroethane	0.0011	U	MG/KG	0.00055	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	8001-35-2	Toxaphene	0.042	UJ	MG/KG	0.028	0.042	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	83-32-9	Acenaphthene	0.0113	UJ	MG/KG	0.0057	0.0142	8270C_SIM	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	85-01-8	Phenanthrene	0.0175	J	MG/KG	0.0057	0.0142	8270C_SIM	TRUE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	86-73-7	Fluorene	0.0113	UJ	MG/KG	0.0057	0.0142	8270C_SIM	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	87-61-6	1,2,3-Trichlorobenzene	0.0011	UJ	MG/KG	0.00057	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	90-12-0	1-Methylnaphthalene	0.0113	UJ	MG/KG	0.0057	0.0142	8270C_SIM	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	91-20-3	Naphthalene	0.0113	UJ	MG/KG	0.0057	0.0142	8270C_SIM	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	91-57-6	2-Methylnaphthalene	0.0113	UJ	MG/KG	0.0057	0.0142	8270C_SIM	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	95-50-1	1,2-Dichlorobenzene	0.001	UJ	MG/KG	0.00052	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	959-98-8	Endosulfan I	0.00037	UJ	MG/KG	0.00019	0.0013	8081A	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	96-12-8	1,2-Dibromo-3-chloropropane	0.0046	UJ	MG/KG	0.0026	0.0046	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	98-82-8	Isopropylbenzene	0.0011	UJ	MG/KG	0.00056	0.0019	8260B	FALSE
VWW06-SD011	VWW06-SD011-0211	0	0.5	04-Feb-11	SS	TOC	Total organic carbon (TOC)	8500	=	MG/KG	26	68	9060	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7429-90-5	Aluminum	8030	=	MG/KG	1.1	11	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-36-0	Antimony	2.1	J	MG/KG	1.1	13	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-38-2	Arsenic	1.8	=	MG/KG	0.81	1.8	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-39-3	Barium	31.8	=	MG/KG	0.56	11	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-41-7	Beryllium	0.13	J	MG/KG	0.11	0.28	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-43-9	Cadmium	0.79	=	MG/KG	0.056	0.22	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-70-2	Calcium	84500	=	MG/KG	22	1100	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-47-3	Chromium	16.3	=	MG/KG	0.09	0.56	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-48-4	Cobalt	6.7	=	MG/KG	0.046	2.8	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-50-8	Copper	69.9	=	MG/KG	0.12	1.4	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7439-89-6	Iron	17100	=	MG/KG	1.5	5.6	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7439-92-1	Lead	145	=	MG/KG	1	22	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7439-95-4	Magnesium	5990	=	MG/KG	5.6	280	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7439-96-5	Manganese	426	=	MG/KG	0.11	3.4	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7439-97-6	Mercury	0.035	J	MG/KG	0.013	0.089	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-02-0	Nickel	10.7	=	MG/KG	0.18	2.2	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-09-7	Potassium	1550	=	MG/KG	5.6	560	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7782-49-2	Selenium	2.4	J	MG/KG	0.69	22	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-22-4	Silver	0.27	J	MG/KG	0.067	0.56	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-23-5	Sodium	8430	=	MG/KG	190	2200	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-62-2	Vanadium	29	=	MG/KG	0.037	2.8	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-66-6	Zinc	126	J	MG/KG	0.21	1.1	SW6010B	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	72-54-8	4,4'-DDD	0.0356	J	MG/KG	0.016	0.078	SW8081A	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	72-55-9	4,4'-DDE	0.086	=	MG/KG	0.016	0.078	SW8081A	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	50-29-3	4,4'-DDT	0.352	=	MG/KG	0.016	0.078	SW8081A	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	56-55-3	Benzo(a)anthracene	0.082	J	MG/KG	0.039	0.19	SW8270C	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	50-32-8	Benzo(a)pyrene	0.122	=	MG/KG	0.016	0.031	SW8270C	TRUE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	205-99-2	Benzo(b)fluoranthene	0.213	=	MG/KG	0.039	0.19	SW8270C	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	191-24-2	Benzo(g,h,i)perylene	0.087	=	MG/KG	0.016	0.031	SW8270C	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	207-08-9	Benzo(k)fluoranthene	0.0716	=	MG/KG	0.016	0.031	SW8270C	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	218-01-9	Chrysene	0.0919	=	MG/KG	0.016	0.031	SW8270C	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	206-44-0	Fluoranthene	0.101	J	MG/KG	0.039	0.19	SW8270C	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	193-39-5	Indeno(1,2,3-cd)pyrene	0.126	=	MG/KG	0.016	0.031	SW8270C	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	129-00-0	Pyrene	0.0995	J	MG/KG	0.039	0.19	SW8270C	TRUE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	100-01-6	4-Nitroaniline	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	100-02-7	4-Nitrophenol	0.97	U	MG/KG	0.97	0.97	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	100-51-6	Benzyl alcohol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	101-55-3	4-Bromophenyl-phenylether	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	1024-57-3	Heptachlor epoxide	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	1031-07-8	Endosulfan sulfate	0.078	U	MG/KG	0.078	0.078	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	105-67-9	2,4-Dimethylphenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	106-47-8	4-Chloroaniline	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	108-60-1	2,2'-Oxybis(1-chloropropane)	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	108-95-2	Phenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	11096-82-5	Aroclor-1260	0.019	U	MG/KG	0.019	0.019	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	11097-69-1	Aroclor-1254	0.019	U	MG/KG	0.019	0.019	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	11104-28-2	Aroclor-1221	0.019	U	MG/KG	0.019	0.019	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	11141-16-5	Aroclor-1232	0.019	U	MG/KG	0.019	0.019	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	111-44-4	bis(2-Chloroethyl)ether	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	111-91-1	bis(2-Chloroethoxy)methane	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	117-81-7	bis(2-Ethylhexyl)phthalate	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	117-84-0	Di-n-octylphthalate	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	118-74-1	Hexachlorobenzene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	118-96-7	2,4,6-Trinitrotoluene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	120-12-7	Anthracene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	120-83-2	2,4-Dichlorophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	121-14-2	2,4-Dinitrotoluene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	121-82-4	RDX	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	12672-29-6	Aroclor-1248	0.019	U	MG/KG	0.019	0.019	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	12674-11-2	Aroclor-1016	0.019	U	MG/KG	0.019	0.019	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	131-11-3	Dimethyl phthalate	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	132-64-9	Dibenzofuran	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	1336-36-3	Polychlorinated biphenyls (PCBs)	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	19406-51-0	4-Amino-2,6-dinitrotoluene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	208-96-8	Acenaphthylene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	2691-41-0	HMX	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	309-00-2	Aldrin	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	319-84-6	alpha-BHC	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	319-85-7	beta-BHC	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	319-86-8	delta-BHC	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	33213-65-9	Endosulfan II	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	35572-78-2	2-Amino-4,6-dinitrotoluene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	479-45-8	Tetryl	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	5103-71-9	alpha-Chlordane	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	5103-74-2	gamma-Chlordane	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	51-28-5	2,4-Dinitrophenol	0.97	U	MG/KG	0.97	0.97	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	534-52-1	4,6-Dinitro-2-methylphenol	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	53469-21-9	Aroclor-1242	0.019	U	MG/KG	0.019	0.019	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	53494-70-5	Endrin ketone	0.078	U	MG/KG	0.078	0.078	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	53-70-3	Dibenz(a,h)anthracene	0.031	U	MG/KG	0.031	0.031	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	57-12-5	Cyanide	0.13	U	MG/KG	0.13	0.13	SW6010B	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	58-89-9	gamma-BHC (Lindane)	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	59-50-7	4-Chloro-3-methylphenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	60-57-1	Dieldrin	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	606-20-2	2,6-Dinitrotoluene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	621-64-7	n-Nitroso-di-n-propylamine	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	65-85-0	Benzoic acid	0.97	U	MG/KG	0.97	0.97	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	67-72-1	Hexachloroethane	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7005-72-3	4-Chlorophenyl-phenylether	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	72-20-8	Endrin	0.078	U	MG/KG	0.078	0.078	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	72-43-5	Methoxychlor	0.078	U	MG/KG	0.078	0.078	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7421-93-4	Endrin aldehyde	0.078	U	MG/KG	0.078	0.078	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	7440-28-0	Thallium	11	U	MG/KG	11	11	SW6010B	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	76-44-8	Heptachlor	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	77-47-4	Hexachlorocyclopentadiene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	78-59-1	Isophorone	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	8001-35-2	Toxaphene	1.9	U	MG/KG	1.9	1.9	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	83-32-9	Acenaphthene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	84-66-2	Diethylphthalate	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	84-74-2	Di-n-butylphthalate	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	85-01-8	Phenanthrene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	85-68-7	Butylbenzylphthalate	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	86-30-6	n-Nitrosodiphenylamine	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	86-73-7	Fluorene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	86-74-8	Carbazole	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	87-68-3	Hexachlorobutadiene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	87-86-5	Pentachlorophenol	0.97	U	MG/KG	0.97	0.97	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	88-06-2	2,4,6-Trichlorophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	88-72-2	2-Nitrotoluene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	88-74-4	2-Nitroaniline	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	88-75-5	2-Nitrophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	90-12-0	1-Methylnaphthalene	0.31	U	MG/KG	0.31	0.31	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	91-20-3	Naphthalene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	91-57-6	2-Methylnaphthalene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	91-58-7	2-Chloronaphthalene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	91-94-1	3,3'-Dichlorobenzidine	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	95-48-7	2-Methylphenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	95-57-8	2-Chlorophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	95-95-4	2,4,5-Trichlorophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	959-98-8	Endosulfan I	0.039	U	MG/KG	0.039	0.039	SW8081A	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	98-95-3	Nitrobenzene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	99-08-1	3-Nitrotoluene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	99-09-2	3-Nitroaniline	0.39	U	MG/KG	0.39	0.39	SW8270C	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	99-35-4	1,3,5-Trinitrobenzene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	99-65-0	1,3-Dinitrobenzene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	99-99-0	4-Nitrotoluene	0.14	U	MG/KG	0.14	0.14	SW8330	FALSE
VWW06-SO132	116701-06-Z-132	0	0.5	24-Jun-09	SS	m&pCRESOL	3- and 4-Methylphenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7429-90-5	Aluminum	16200	=	MG/KG	1.1	11	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-36-0	Antimony	1.3	J	MG/KG	0.51	6.4	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-38-2	Arsenic	0.48	J	MG/KG	0.38	0.85	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-39-3	Barium	48.9	=	MG/KG	0.53	11	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-41-7	Beryllium	0.3	=	MG/KG	0.11	0.26	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-70-2	Calcium	4180	=	MG/KG	5.3	260	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-47-3	Chromium	24.6	=	MG/KG	0.085	0.53	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-48-4	Cobalt	16.5	=	MG/KG	0.044	2.6	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-50-8	Copper	51.6	=	MG/KG	0.11	1.3	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7439-89-6	Iron	32200	=	MG/KG	2.8	11	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7439-92-1	Lead	4	J	MG/KG	0.48	11	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7439-95-4	Magnesium	11500	=	MG/KG	5.3	260	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7439-96-5	Manganese	911	=	MG/KG	0.13	4	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-02-0	Nickel	16.6	=	MG/KG	0.17	2.1	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-09-7	Potassium	640	=	MG/KG	5.3	530	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-23-5	Sodium	3110	=	MG/KG	44	530	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-62-2	Vanadium	108	=	MG/KG	0.07	5.3	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-66-6	Zinc	51.5	J	MG/KG	0.2	1.1	SW6010B	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	56-55-3	Benzo(a)anthracene	0.0664	=	MG/KG	0.015	0.03	SW8270C	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	50-32-8	Benzo(a)pyrene	0.0847	=	MG/KG	0.015	0.03	SW8270C	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	205-99-2	Benzo(b)fluoranthene	0.119	J	MG/KG	0.037	0.19	SW8270C	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	191-24-2	Benzo(g,h,i)perylene	0.0432	=	MG/KG	0.015	0.03	SW8270C	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	207-08-9	Benzo(k)fluoranthene	0.0453	=	MG/KG	0.015	0.03	SW8270C	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	218-01-9	Chrysene	0.0651	J	MG/KG	0.037	0.19	SW8270C	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	206-44-0	Fluoranthene	0.0485	J	MG/KG	0.037	0.19	SW8270C	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	193-39-5	Indeno(1,2,3-cd)pyrene	0.0608	=	MG/KG	0.015	0.03	SW8270C	TRUE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	129-00-0	Pyrene	0.0403	J	MG/KG	0.037	0.19	SW8270C	TRUE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	100-01-6	4-Nitroaniline	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	100-02-7	4-Nitrophenol	0.93	U	MG/KG	0.93	0.93	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	100-51-6	Benzyl alcohol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	101-55-3	4-Bromophenyl-phenylether	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	1024-57-3	Heptachlor epoxide	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	1031-07-8	Endosulfan sulfate	0.0037	U	MG/KG	0.0037	0.0037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	105-67-9	2,4-Dimethylphenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	106-47-8	4-Chloroaniline	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	108-60-1	2,2'-Oxybis(1-chloropropane)	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	108-95-2	Phenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	11096-82-5	Aroclor-1260	0.018	U	MG/KG	0.018	0.018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	11097-69-1	Aroclor-1254	0.018	U	MG/KG	0.018	0.018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	11104-28-2	Aroclor-1221	0.018	U	MG/KG	0.018	0.018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	11141-16-5	Aroclor-1232	0.018	U	MG/KG	0.018	0.018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	111-44-4	bis(2-Chloroethyl)ether	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	111-91-1	bis(2-Chloroethoxy)methane	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	117-81-7	bis(2-Ethylhexyl)phthalate	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	117-84-0	Di-n-octylphthalate	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	118-74-1	Hexachlorobenzene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	118-96-7	2,4,6-Trinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	120-12-7	Anthracene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	120-83-2	2,4-Dichlorophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	121-14-2	2,4-Dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	121-82-4	RDX	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	12672-29-6	Aroclor-1248	0.018	U	MG/KG	0.018	0.018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	12674-11-2	Aroclor-1016	0.018	U	MG/KG	0.018	0.018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	131-11-3	Dimethyl phthalate	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	132-64-9	Dibenzofuran	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	1336-36-3	Polychlorinated biphenyls (PCBs)	0.037	U	MG/KG	0.037	0.037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	19406-51-0	4-Amino-2,6-dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	208-96-8	Acenaphthylene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	2691-41-0	HMX	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	309-00-2	Aldrin	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	319-84-6	alpha-BHC	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	319-85-7	beta-BHC	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	319-86-8	delta-BHC	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	33213-65-9	Endosulfan II	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	35572-78-2	2-Amino-4,6-dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	479-45-8	Tetryl	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	50-29-3	4,4'-DDT	0.0037	U	MG/KG	0.0037	0.0037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	5103-71-9	alpha-Chlordane	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	5103-74-2	gamma-Chlordane	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	51-28-5	2,4-Dinitrophenol	0.93	U	MG/KG	0.93	0.93	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	534-52-1	4,6-Dinitro-2-methylphenol	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	53469-21-9	Aroclor-1242	0.018	U	MG/KG	0.018	0.018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	53494-70-5	Endrin ketone	0.0037	U	MG/KG	0.0037	0.0037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	53-70-3	Dibenz(a,h)anthracene	0.03	U	MG/KG	0.03	0.03	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	57-12-5	Cyanide	0.13	U	MG/KG	0.13	0.13	SW6010B	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	58-89-9	gamma-BHC (Lindane)	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	59-50-7	4-Chloro-3-methylphenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	60-57-1	Dieldrin	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	606-20-2	2,6-Dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	621-64-7	n-Nitroso-di-n-propylamine	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	65-85-0	Benzoic acid	0.93	U	MG/KG	0.93	0.93	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	67-72-1	Hexachloroethane	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7005-72-3	4-Chlorophenyl-phenylether	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	72-20-8	Endrin	0.0037	U	MG/KG	0.0037	0.0037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	72-43-5	Methoxychlor	0.0037	U	MG/KG	0.0037	0.0037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	72-54-8	4,4'-DDD	0.0037	U	MG/KG	0.0037	0.0037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	72-55-9	4,4'-DDE	0.0037	U	MG/KG	0.0037	0.0037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7421-93-4	Endrin aldehyde	0.0037	U	MG/KG	0.0037	0.0037	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7439-97-6	Mercury	0.093	U	MG/KG	0.093	0.093	SW6010B	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-22-4	Silver	0.53	U	MG/KG	0.53	0.53	SW6010B	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-28-0	Thallium	22	U	MG/KG	22	22	SW6010B	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7440-43-9	Cadmium	0.42	U	MG/KG	0.42	0.42	SW6010B	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	76-44-8	Heptachlor	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	77-47-4	Hexachlorocyclopentadiene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	7782-49-2	Selenium	11	U	MG/KG	11	11	SW6010B	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	78-59-1	Isophorone	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	8001-35-2	Toxaphene	0.092	U	MG/KG	0.092	0.092	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	83-32-9	Acenaphthene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	84-66-2	Diethylphthalate	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	84-74-2	Di-n-butylphthalate	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	85-01-8	Phenanthrene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	85-68-7	Butylbenzylphthalate	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	86-30-6	n-Nitrosodiphenylamine	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	86-73-7	Fluorene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	86-74-8	Carbazole	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	87-68-3	Hexachlorobutadiene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	87-86-5	Pentachlorophenol	0.93	U	MG/KG	0.93	0.93	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	88-06-2	2,4,6-Trichlorophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	88-72-2	2-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	88-74-4	2-Nitroaniline	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	88-75-5	2-Nitrophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	90-12-0	1-Methylnaphthalene	0.3	U	MG/KG	0.3	0.3	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	91-20-3	Naphthalene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	91-57-6	2-Methylnaphthalene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	91-58-7	2-Chloronaphthalene	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	91-94-1	3,3'-Dichlorobenzidine	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	95-48-7	2-Methylphenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	95-57-8	2-Chlorophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	95-95-4	2,4,5-Trichlorophenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	959-98-8	Endosulfan I	0.0018	U	MG/KG	0.0018	0.0018	SW8081A	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	98-95-3	Nitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	99-08-1	3-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	99-09-2	3-Nitroaniline	0.37	U	MG/KG	0.37	0.37	SW8270C	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	99-35-4	1,3,5-Trinitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	99-65-0	1,3-Dinitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	99-99-0	4-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO136	116701-06-Z-136	0	0.5	24-Jun-09	SS	m&pCRESOL	3- and 4-Methylphenol	0.19	U	MG/KG	0.19	0.19	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7429-90-5	Aluminum	4010	=	MG/KG	1.4	14	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-38-2	Arsenic	1.7	J	MG/KG	1	2.2	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-39-3	Barium	17.6	=	MG/KG	0.69	14	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-43-9	Cadmium	0.12	J	MG/KG	0.069	0.28	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-70-2	Calcium	124000	=	MG/KG	28	1400	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-47-3	Chromium	6.7	=	MG/KG	0.11	0.69	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-48-4	Cobalt	2.2	J	MG/KG	0.058	3.5	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-50-8	Copper	25.1	=	MG/KG	0.15	1.7	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7439-89-6	Iron	6860	=	MG/KG	1.8	6.9	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7439-92-1	Lead	62.1	=	MG/KG	1.3	28	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7439-95-4	Magnesium	3080	=	MG/KG	6.9	350	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7439-96-5	Manganese	75.6	=	MG/KG	0.035	1	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7439-97-6	Mercury	0.02	J	MG/KG	0.017	0.12	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-02-0	Nickel	4.7	=	MG/KG	0.22	2.8	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-09-7	Potassium	1500	=	MG/KG	6.9	690	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7782-49-2	Selenium	4.4	J	MG/KG	0.86	28	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-23-5	Sodium	9180	=	MG/KG	230	2800	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-62-2	Vanadium	13.8	=	MG/KG	0.046	3.5	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-66-6	Zinc	56.7	J	MG/KG	0.26	1.4	SW6010B	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	72-55-9	4,4'-DDE	0.0023	J	MG/KG	0.00094	0.0047	SW8081A	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	205-99-2	Benzo(b)fluoranthene	0.0274	J	MG/KG	0.019	0.038	SW8270C	TRUE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	100-01-6	4-Nitroaniline	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	100-02-7	4-Nitrophenol	1.2	U	MG/KG	1.2	1.2	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	100-51-6	Benzyl alcohol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	101-55-3	4-Bromophenyl-phenylether	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	1024-57-3	Heptachlor epoxide	0.0024	UJ	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	1031-07-8	Endosulfan sulfate	0.0047	U	MG/KG	0.0047	0.0047	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	105-67-9	2,4-Dimethylphenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	106-47-8	4-Chloroaniline	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	108-60-1	2,2'-Oxybis(1-chloropropane)	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	108-95-2	Phenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	11096-82-5	Aroclor-1260	0.024	U	MG/KG	0.024	0.024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	11097-69-1	Aroclor-1254	0.024	U	MG/KG	0.024	0.024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	11104-28-2	Aroclor-1221	0.024	U	MG/KG	0.024	0.024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	11141-16-5	Aroclor-1232	0.024	U	MG/KG	0.024	0.024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	111-44-4	bis(2-Chloroethyl)ether	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	111-91-1	bis(2-Chloroethoxy)methane	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	117-81-7	bis(2-Ethylhexyl)phthalate	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	117-84-0	Di-n-octylphthalate	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	118-74-1	Hexachlorobenzene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	118-96-7	2,4,6-Trinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	120-12-7	Anthracene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	120-83-2	2,4-Dichlorophenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	121-14-2	2,4-Dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	121-82-4	RDX	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	12672-29-6	Aroclor-1248	0.024	U	MG/KG	0.024	0.024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	12674-11-2	Aroclor-1016	0.024	U	MG/KG	0.024	0.024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	129-00-0	Pyrene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	131-11-3	Dimethyl phthalate	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	132-64-9	Dibenzofuran	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	1336-36-3	Polychlorinated biphenyls (PCBs)	0.047	U	MG/KG	0.047	0.047	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	191-24-2	Benzo(g,h,i)perylene	0.038	U	MG/KG	0.038	0.038	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	193-39-5	Indeno(1,2,3-cd)pyrene	0.038	U	MG/KG	0.038	0.038	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	19406-51-0	4-Amino-2,6-dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	206-44-0	Fluoranthene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	207-08-9	Benzo(k)fluoranthene	0.038	U	MG/KG	0.038	0.038	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	208-96-8	Acenaphthylene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	218-01-9	Chrysene	0.038	U	MG/KG	0.038	0.038	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	2691-41-0	HMX	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	309-00-2	Aldrin	0.0024	U	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	319-84-6	alpha-BHC	0.0024	U	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	319-85-7	beta-BHC	0.0024	U	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	319-86-8	delta-BHC	0.0024	U	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	33213-65-9	Endosulfan II	0.0024	U	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	35572-78-2	2-Amino-4,6-dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	479-45-8	Tetryl	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	50-29-3	4,4'-DDT	0.0047	UJ	MG/KG	0.0047	0.0047	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	50-32-8	Benzo(a)pyrene	0.038	U	MG/KG	0.038	0.038	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	5103-71-9	alpha-Chlordane	0.0024	UJ	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	5103-74-2	gamma-Chlordane	0.0024	UJ	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	51-28-5	2,4-Dinitrophenol	1.2	U	MG/KG	1.2	1.2	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	534-52-1	4,6-Dinitro-2-methylphenol	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	53469-21-9	Aroclor-1242	0.024	U	MG/KG	0.024	0.024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	53494-70-5	Endrin ketone	0.0047	UJ	MG/KG	0.0047	0.0047	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	53-70-3	Dibenz(a,h)anthracene	0.038	U	MG/KG	0.038	0.038	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	56-55-3	Benzo(a)anthracene	0.038	U	MG/KG	0.038	0.038	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	57-12-5	Cyanide	0.15	U	MG/KG	0.15	0.15	SW6010B	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	58-89-9	gamma-BHC (Lindane)	0.0024	U	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	59-50-7	4-Chloro-3-methylphenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	60-57-1	Dieldrin	0.0024	UJ	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	606-20-2	2,6-Dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	621-64-7	n-Nitroso-di-n-propylamine	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	65-85-0	Benzoic acid	1.2	UJ	MG/KG	1.2	1.2	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	67-72-1	Hexachloroethane	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7005-72-3	4-Chlorophenyl-phenylether	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	72-20-8	Endrin	0.0047	U	MG/KG	0.0047	0.0047	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	72-43-5	Methoxychlor	0.0047	UJ	MG/KG	0.0047	0.0047	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	72-54-8	4,4'-DDD	0.0047	U	MG/KG	0.0047	0.0047	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7421-93-4	Endrin aldehyde	0.0047	U	MG/KG	0.0047	0.0047	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-22-4	Silver	0.69	U	MG/KG	0.69	0.69	SW6010B	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-28-0	Thallium	3.5	U	MG/KG	3.5	3.5	SW6010B	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-36-0	Antimony	17	U	MG/KG	17	17	SW6010B	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	7440-41-7	Beryllium	0.35	U	MG/KG	0.35	0.35	SW6010B	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	76-44-8	Heptachlor	0.0024	U	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	77-47-4	Hexachlorocyclopentadiene	0.24	UJ	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	78-59-1	Isophorone	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	8001-35-2	Toxaphene	0.12	U	MG/KG	0.12	0.12	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	83-32-9	Acenaphthene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	84-66-2	Diethylphthalate	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	84-74-2	Di-n-butylphthalate	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	85-01-8	Phenanthrene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	85-68-7	Butylbenzylphthalate	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	86-30-6	n-Nitrosodiphenylamine	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	86-73-7	Fluorene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	86-74-8	Carbazole	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	87-68-3	Hexachlorobutadiene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	87-86-5	Pentachlorophenol	1.2	U	MG/KG	1.2	1.2	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	88-06-2	2,4,6-Trichlorophenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	88-72-2	2-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	88-74-4	2-Nitroaniline	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	88-75-5	2-Nitrophenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	90-12-0	1-Methylnaphthalene	0.38	U	MG/KG	0.38	0.38	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	91-20-3	Naphthalene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	91-57-6	2-Methylnaphthalene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	91-58-7	2-Chloronaphthalene	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	91-94-1	3,3'-Dichlorobenzidine	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	95-48-7	2-Methylphenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	95-57-8	2-Chlorophenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	95-95-4	2,4,5-Trichlorophenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	959-98-8	Endosulfan I	0.0024	U	MG/KG	0.0024	0.0024	SW8081A	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	98-95-3	Nitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	99-08-1	3-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	99-09-2	3-Nitroaniline	0.48	U	MG/KG	0.48	0.48	SW8270C	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	99-35-4	1,3,5-Trinitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	99-65-0	1,3-Dinitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	99-99-0	4-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO137	116701-06-Z-137	0	0.5	24-Jun-09	SS	m&pCRESOL	3- and 4-Methylphenol	0.24	U	MG/KG	0.24	0.24	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7429-90-5	Aluminum	16000	=	MG/KG	1.3	13	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-36-0	Antimony	1.2	J	MG/KG	0.31	3.9	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-38-2	Arsenic	0.69	=	MG/KG	0.23	0.52	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-39-3	Barium	58.7	=	MG/KG	0.65	13	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-41-7	Beryllium	0.32	J	MG/KG	0.13	0.33	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-43-9	Cadmium	0.31	=	MG/KG	0.065	0.26	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-70-2	Calcium	12500	=	MG/KG	6.5	330	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-47-3	Chromium	23.7	=	MG/KG	0.1	0.65	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-48-4	Cobalt	16.2	=	MG/KG	0.054	3.3	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-50-8	Copper	65.7	=	MG/KG	0.14	1.6	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7439-89-6	Iron	26700	=	MG/KG	1.7	6.5	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7439-92-1	Lead	47.7	=	MG/KG	0.29	6.5	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7439-95-4	Magnesium	9850	=	MG/KG	6.5	330	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7439-96-5	Manganese	961	=	MG/KG	0.16	4.9	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7439-97-6	Mercury	0.027	J	MG/KG	0.016	0.11	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-02-0	Nickel	18.1	=	MG/KG	0.21	2.6	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-09-7	Potassium	2800	=	MG/KG	6.5	650	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-22-4	Silver	0.084	J	MG/KG	0.078	0.65	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-23-5	Sodium	7070	=	MG/KG	110	1300	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-62-2	Vanadium	82.3	=	MG/KG	0.043	3.3	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-66-6	Zinc	127	J	MG/KG	0.25	1.3	SW6010B	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	72-55-9	4,4'-DDE	0.0089	=	MG/KG	0.00088	0.0044	SW8081A	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	11097-69-1	Aroclor-1254	0.0613	=	MG/KG	0.011	0.022	SW8081A	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	1336-36-3	Polychlorinated biphenyls (PCBs)	0.0613	=	MG/KG	0.022	0.044	SW8081A	TRUE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	205-99-2	Benzo(b)fluoranthene	0.0308	J	MG/KG	0.018	0.036	SW8270C	TRUE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	100-01-6	4-Nitroaniline	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	100-02-7	4-Nitrophenol	1.1	U	MG/KG	1.1	1.1	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	100-51-6	Benzyl alcohol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	101-55-3	4-Bromophenyl-phenylether	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	1024-57-3	Heptachlor epoxide	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	1031-07-8	Endosulfan sulfate	0.0044	U	MG/KG	0.0044	0.0044	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	105-67-9	2,4-Dimethylphenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	106-47-8	4-Chloroaniline	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	108-60-1	2,2'-Oxybis(1-chloropropane)	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	108-95-2	Phenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	11096-82-5	Aroclor-1260	0.022	U	MG/KG	0.022	0.022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	11104-28-2	Aroclor-1221	0.022	U	MG/KG	0.022	0.022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	11141-16-5	Aroclor-1232	0.022	U	MG/KG	0.022	0.022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	111-44-4	bis(2-Chloroethyl)ether	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	111-91-1	bis(2-Chloroethoxy)methane	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	117-81-7	bis(2-Ethylhexyl)phthalate	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	117-84-0	Di-n-octylphthalate	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	118-74-1	Hexachlorobenzene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	118-96-7	2,4,6-Trinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	120-12-7	Anthracene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	120-83-2	2,4-Dichlorophenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	121-14-2	2,4-Dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	121-82-4	RDX	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	12672-29-6	Aroclor-1248	0.022	U	MG/KG	0.022	0.022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	12674-11-2	Aroclor-1016	0.022	U	MG/KG	0.022	0.022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	129-00-0	Pyrene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	131-11-3	Dimethyl phthalate	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	132-64-9	Dibenzofuran	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	191-24-2	Benzo(g,h,i)perylene	0.036	U	MG/KG	0.036	0.036	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	193-39-5	Indeno(1,2,3-cd)pyrene	0.036	U	MG/KG	0.036	0.036	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	19406-51-0	4-Amino-2,6-dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	206-44-0	Fluoranthene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	207-08-9	Benzo(k)fluoranthene	0.036	U	MG/KG	0.036	0.036	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	208-96-8	Acenaphthylene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	218-01-9	Chrysene	0.036	U	MG/KG	0.036	0.036	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	2691-41-0	HMX	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	309-00-2	Aldrin	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	319-84-6	alpha-BHC	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	319-85-7	beta-BHC	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	319-86-8	delta-BHC	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	33213-65-9	Endosulfan II	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	35572-78-2	2-Amino-4,6-dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	479-45-8	Tetryl	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	50-29-3	4,4'-DDT	0.044	U	MG/KG	0.044	0.044	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	50-32-8	Benzo(a)pyrene	0.036	U	MG/KG	0.036	0.036	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	5103-71-9	alpha-Chlordane	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	5103-74-2	gamma-Chlordane	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	51-28-5	2,4-Dinitrophenol	1.1	U	MG/KG	1.1	1.1	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	534-52-1	4,6-Dinitro-2-methylphenol	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	53469-21-9	Aroclor-1242	0.022	U	MG/KG	0.022	0.022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	53494-70-5	Endrin ketone	0.0044	U	MG/KG	0.0044	0.0044	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	53-70-3	Dibenz(a,h)anthracene	0.036	U	MG/KG	0.036	0.036	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	56-55-3	Benzo(a)anthracene	0.036	U	MG/KG	0.036	0.036	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	57-12-5	Cyanide	0.14	U	MG/KG	0.14	0.14	SW6010B	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	58-89-9	gamma-BHC (Lindane)	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	59-50-7	4-Chloro-3-methylphenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	60-57-1	Dieldrin	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	606-20-2	2,6-Dinitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	621-64-7	n-Nitroso-di-n-propylamine	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	65-85-0	Benzoic acid	1.1	U	MG/KG	1.1	1.1	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	67-72-1	Hexachloroethane	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7005-72-3	4-Chlorophenyl-phenylether	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	72-20-8	Endrin	0.0044	U	MG/KG	0.0044	0.0044	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	72-43-5	Methoxychlor	0.0044	UJ	MG/KG	0.0044	0.0044	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	72-54-8	4,4'-DDD	0.044	U	MG/KG	0.044	0.044	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7421-93-4	Endrin aldehyde	0.0044	U	MG/KG	0.0044	0.0044	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7440-28-0	Thallium	13	U	MG/KG	13	13	SW6010B	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	76-44-8	Heptachlor	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	77-47-4	Hexachlorocyclopentadiene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	7782-49-2	Selenium	6.5	U	MG/KG	6.5	6.5	SW6010B	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	78-59-1	Isophorone	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	8001-35-2	Toxaphene	0.11	U	MG/KG	0.11	0.11	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	83-32-9	Acenaphthene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	84-66-2	Diethylphthalate	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	84-74-2	Di-n-butylphthalate	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	85-01-8	Phenanthrene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	85-68-7	Butylbenzylphthalate	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	86-30-6	n-Nitrosodiphenylamine	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	86-73-7	Fluorene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	86-74-8	Carbazole	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	87-68-3	Hexachlorobutadiene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	87-86-5	Pentachlorophenol	1.1	U	MG/KG	1.1	1.1	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	88-06-2	2,4,6-Trichlorophenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	88-72-2	2-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	88-74-4	2-Nitroaniline	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	88-75-5	2-Nitrophenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	90-12-0	1-Methylnaphthalene	0.36	U	MG/KG	0.36	0.36	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	91-20-3	Naphthalene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	91-57-6	2-Methylnaphthalene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	91-58-7	2-Chloronaphthalene	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	91-94-1	3,3'-Dichlorobenzidine	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	95-48-7	2-Methylphenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	95-57-8	2-Chlorophenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	95-95-4	2,4,5-Trichlorophenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	959-98-8	Endosulfan I	0.0022	U	MG/KG	0.0022	0.0022	SW8081A	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	98-95-3	Nitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	99-08-1	3-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	99-09-2	3-Nitroaniline	0.45	U	MG/KG	0.45	0.45	SW8270C	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	99-35-4	1,3,5-Trinitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	99-65-0	1,3-Dinitrobenzene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	99-99-0	4-Nitrotoluene	0.16	U	MG/KG	0.16	0.16	SW8330	FALSE
VWW06-SO142	116701-06-Z-142	0	0.5	24-Jun-09	SS	m&pCRESOL	3- and 4-Methylphenol	0.22	U	MG/KG	0.22	0.22	SW8270C	FALSE
VWW06-SS012	VWW06-SS012-0211	0	0.5	07-Feb-11	SS	11096-82-5	Aroclor-1260	0.0088	U	MG/KG	0.0044	0.022	8082	FALSE
VWW06-SS012	VWW06-SS012-0211	0	0.5	07-Feb-11	SS	11097-69-1	Aroclor-1254	0.098	=	MG/KG	0.0068	0.022	8082	TRUE
VWW06-SS012	VWW06-SS012-0211	0	0.5	07-Feb-11	SS	11104-28-2	Aroclor-1221	0.017	U	MG/KG	0.0086	0.022	8082	FALSE
VWW06-SS012	VWW06-SS012-0211	0	0.5	07-Feb-11	SS	11141-16-5	Aroclor-1232	0.022	U	MG/KG	0.014	0.022	8082	FALSE
VWW06-SS012	VWW06-SS012-0211	0	0.5	07-Feb-11	SS	12672-29-6	Aroclor-1248	0.016	U	MG/KG	0.0079	0.022	8082	FALSE
VWW06-SS012	VWW06-SS012-0211	0	0.5	07-Feb-11	SS	12674-11-2	Aroclor-1016	0.019	U	MG/KG	0.0094	0.022	8082	FALSE
VWW06-SS012	VWW06-SS012-0211	0	0.5	07-Feb-11	SS	53469-21-9	Aroclor-1242	0.016	U	MG/KG	0.0079	0.022	8082	FALSE
VWW06-SS013	VWW06-SS013-0211	0	0.5	07-Feb-11	SS	11096-82-5	Aroclor-1260	0.01	U	MG/KG	0.005	0.025	8082	FALSE
VWW06-SS013	VWW06-SS013-0211	0	0.5	07-Feb-11	SS	11097-69-1	Aroclor-1254	0.016	U	MG/KG	0.0079	0.025	8082	FALSE
VWW06-SS013	VWW06-SS013-0211	0	0.5	07-Feb-11	SS	11104-28-2	Aroclor-1221	0.02	U	MG/KG	0.0099	0.025	8082	FALSE
VWW06-SS013	VWW06-SS013-0211	0	0.5	07-Feb-11	SS	11141-16-5	Aroclor-1232	0.025	U	MG/KG	0.016	0.025	8082	FALSE
VWW06-SS013	VWW06-SS013-0211	0	0.5	07-Feb-11	SS	12672-29-6	Aroclor-1248	0.018	U	MG/KG	0.0091	0.025	8082	FALSE
VWW06-SS013	VWW06-SS013-0211	0	0.5	07-Feb-11	SS	12674-11-2	Aroclor-1016	0.022	U	MG/KG	0.011	0.025	8082	FALSE
VWW06-SS013	VWW06-SS013-0211	0	0.5	07-Feb-11	SS	53469-21-9	Aroclor-1242	0.018	U	MG/KG	0.0091	0.025	8082	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	100-41-4	Ethylbenzene	0.44	U	UG/L	0.22	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	100-42-5	Styrene	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	10061-01-5	cis-1,3-Dichloropropene	0.24	U	UG/L	0.12	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	10061-02-6	trans-1,3-Dichloropropene	0.6	U	UG/L	0.3	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	1024-57-3	Heptachlor epoxide	0.0029	U	UG/L	0.0014	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	1031-07-8	Endosulfan sulfate	0.0021	U	UG/L	0.001	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	106-46-7	1,4-Dichlorobenzene	0.3	U	UG/L	0.15	3	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	106-93-4	1,2-Dibromoethane	0.22	U	UG/L	0.11	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	107-06-2	1,2-Dichloroethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	108-10-1	4-Methyl-2-pentanone	2	U	UG/L	1	4	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	108-87-2	Methylcyclohexane	0.54	U	UG/L	0.27	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	108-88-3	Toluene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	108-90-7	Chlorobenzene	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	110-82-7	Cyclohexane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	11096-82-5	Aroclor-1260	0.02	U	UG/L	0.01	0.02	8082	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	11097-69-1	Aroclor-1254	0.0098	U	UG/L	0.0049	0.02	8082	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	11104-28-2	Aroclor-1221	0.02	U	UG/L	0.018	0.02	8082	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	11141-16-5	Aroclor-1232	0.016	U	UG/L	0.0082	0.02	8082	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	120-12-7	Anthracene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	120-82-1	1,2,4-Trichlorobenzene	0.22	U	UG/L	0.11	2	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	124-48-1	Dibromochloromethane	0.26	U	UG/L	0.13	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	12672-29-6	Aroclor-1248	0.011	U	UG/L	0.0053	0.02	8082	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	12674-11-2	Aroclor-1016	0.02	U	UG/L	0.015	0.02	8082	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	127-18-4	Tetrachloroethene	0.42	U	UG/L	0.21	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	129-00-0	Pyrene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	1330-20-7	Xylene, total	1	U	UG/L	0.5	2	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	156-59-2	cis-1,2-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	156-60-5	trans-1,2-Dichloroethene	0.5	U	UG/L	0.33	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	1634-04-4	Methyl-tert-butyl ether (MTBE)	1	U	UG/L	0.5	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	18540-29-9	Chromium (hexavalent)	35	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	18540-29-9_D	Chromium (hexavalent), Dissolved	12	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	191-24-2	Benzo(g,h,i)perylene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	205-99-2	Benzo(b)fluoranthene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	206-44-0	Fluoranthene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	207-08-9	Benzo(k)fluoranthene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	208-96-8	Acenaphthylene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	218-01-9	Chrysene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	309-00-2	Aldrin	0.0033	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	319-84-6	alpha-BHC	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	319-85-7	beta-BHC	0.0025	U	UG/L	0.0012	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	319-86-8	delta-BHC	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	33213-65-9	Endosulfan II	0.0033	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	50-29-3	4,4'-DDT	0.0023	U	UG/L	0.0011	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	50-32-8	Benzo(a)pyrene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	5103-71-9	alpha-Chlordane	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	5103-74-2	gamma-Chlordane	0.005	U	UG/L	0.0025	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	53469-21-9	Aroclor-1242	0.02	U	UG/L	0.013	0.02	8082	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	53494-70-5	Endrin ketone	0.012	U	UG/L	0.0062	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	53-70-3	Dibenz(a,h)anthracene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	541-73-1	1,3-Dichlorobenzene	0.3	U	UG/L	0.15	2	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	56-23-5	Carbon tetrachloride	0.28	U	UG/L	0.14	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	56-55-3	Benzo(a)anthracene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	58-89-9	gamma-BHC (Lindane)	0.005	U	UG/L	0.0025	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	591-78-6	2-Hexanone	0.96	U	UG/L	0.48	4	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	60-57-1	Dieldrin	0.0056	U	UG/L	0.0028	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	67-64-1	Acetone	2.6	U	UG/L	1.3	10	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	67-66-3	Chloroform	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	71-43-2	Benzene	0.34	U	UG/L	0.17	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	71-55-6	1,1,1-Trichloroethane	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	72-20-8	Endrin	0.0037	U	UG/L	0.0019	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	72-43-5	Methoxychlor	0.0037	U	UG/L	0.0019	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	72-54-8	4,4'-DDD	0.0054	U	UG/L	0.0027	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	72-55-9	4,4'-DDE	0.0079	U	UG/L	0.0039	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7421-93-4	Endrin aldehyde	0.0031	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7429-90-5_D	Aluminum, Dissolved	1220	J	UG/L	186	2000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-89-6	Iron	392	J	UG/L	110	800	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-89-6_D	Iron, Dissolved	220	U	UG/L	110	800	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-92-1	Lead	10	U	UG/L	3.4	50	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-92-1_D	Lead, Dissolved	10	U	UG/L	3.4	50	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-95-4	Magnesium	1310000	J	UG/L	196	2000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-95-4_D	Magnesium, Dissolved	1320000	=	UG/L	196	2000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-96-5	Manganese	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-96-5_D	Manganese, Dissolved	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-97-6	Mercury	0.0411	J	UG/L	0.037	0.2	7470A	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7439-97-6_D	Mercury, Dissolved	0.074	UJ	UG/L	0.037	0.2	7470A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-02-0	Nickel	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-02-0_D	Nickel, Dissolved	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-09-7	Potassium	433000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-09-7_D	Potassium, Dissolved	438000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-22-4	Silver	2.5	U	UG/L	1.1	50	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-22-4_D	Silver, Dissolved	2.5	U	UG/L	1.1	50	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-23-5	Sodium	11100000	=	UG/L	9000	15000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-23-5_D	Sodium, Dissolved	11000000	J	UG/L	9000	15000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-28-0	Thallium	121	J	UG/L	88	200	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-28-0_D	Thallium, Dissolved	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-36-0	Antimony	10.3	J	UG/L	10	100	6020	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-36-0_D	Antimony, Dissolved	10	U	UG/L	10	100	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-38-2	Arsenic	25	U	UG/L	9.5	100	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-38-2_D	Arsenic, Dissolved	132.4	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-39-3	Barium	7.06	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-39-3_D	Barium, Dissolved	7.58	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-41-7	Beryllium	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-41-7_D	Beryllium, Dissolved	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-43-9	Cadmium	10	U	UG/L	4.2	50	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-43-9_D	Cadmium, Dissolved	10	U	UG/L	4.2	50	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-47-3	Chromium	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-47-3_D	Chromium, Dissolved	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-48-4	Cobalt	10	U	UG/L	1.2	50	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-48-4_D	Cobalt, Dissolved	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-50-8	Copper	25	U	UG/L	12	250	6020	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-50-8_D	Copper, Dissolved	108	U	UG/L	54	200	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-62-2	Vanadium	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-62-2_D	Vanadium, Dissolved	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-66-6	Zinc	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-66-6_D	Zinc, Dissolved	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-70-2	Calcium	419000	J	UG/L	780	2000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7440-70-2_D	Calcium, Dissolved	418000	=	UG/L	780	2000	6010B	TRUE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	74-83-9	Bromomethane	0.86	U	UG/L	0.43	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	74-87-3	Chloromethane	0.64	U	UG/L	0.32	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	74-97-5	Bromochloromethane	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-00-3	Chloroethane	1	U	UG/L	0.72	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-01-4	Vinyl chloride	0.36	U	UG/L	0.18	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-09-2	Methylene chloride	1.3	U	UG/L	0.66	5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-15-0	Carbon disulfide	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-25-2	Bromoform	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-27-4	Bromodichloromethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-34-3	1,1-Dichloroethane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-35-4	1,1-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-69-4	Trichlorofluoromethane (Freon-11)	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	75-71-8	Dichlorodifluoromethane (Freon-12)	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.46	U	UG/L	0.23	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	76-44-8	Heptachlor	0.0082	U	UG/L	0.0041	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7782-49-2	Selenium	164	UJ	UG/L	82	180	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	7782-49-2_D	Selenium, Dissolved	164	U	UG/L	82	180	6010B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	78-87-5	1,2-Dichloropropane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	78-93-3	2-Butanone	4	U	UG/L	2	4	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	79-00-5	1,1,2-Trichloroethane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	79-01-6	Trichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	79-20-9	Methyl acetate	0.76	U	UG/L	0.38	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	UG/L	0.13	1	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	8001-35-2	Toxaphene	0.37	U	UG/L	0.19	0.52	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	83-32-9	Acenaphthene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	85-01-8	Phenanthrene	0.051	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	86-73-7	Fluorene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	87-61-6	1,2,3-Trichlorobenzene	0.32	U	UG/L	0.16	2	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	90-12-0	1-Methylnaphthalene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	91-20-3	Naphthalene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	91-57-6	2-Methylnaphthalene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	95-50-1	1,2-Dichlorobenzene	0.5	U	UG/L	0.25	2	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	959-98-8	Endosulfan I	0.0089	U	UG/L	0.0044	0.052	8081A	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	96-12-8	1,2-Dibromo-3-chloropropane	2	U	UG/L	1	2	8260B	FALSE
VWW06-SW003	VWW06-SW003-0211	0	0.6	03-Feb-11	SW	98-82-8	Isopropylbenzene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	100-41-4	Ethylbenzene	0.44	U	UG/L	0.22	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	100-42-5	Styrene	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	10061-01-5	cis-1,3-Dichloropropene	0.24	U	UG/L	0.12	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	10061-02-6	trans-1,3-Dichloropropene	0.6	U	UG/L	0.3	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	1024-57-3	Heptachlor epoxide	0.0029	U	UG/L	0.0014	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	1031-07-8	Endosulfan sulfate	0.0021	U	UG/L	0.001	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	106-46-7	1,4-Dichlorobenzene	0.3	U	UG/L	0.15	3	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	106-93-4	1,2-Dibromoethane	0.22	U	UG/L	0.11	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	107-06-2	1,2-Dichloroethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	108-10-1	4-Methyl-2-pentanone	2	U	UG/L	1	4	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	108-87-2	Methylcyclohexane	0.54	U	UG/L	0.27	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	108-88-3	Toluene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	108-90-7	Chlorobenzene	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	110-82-7	Cyclohexane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	11096-82-5	Aroclor-1260	0.02	U	UG/L	0.01	0.02	8082	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	11097-69-1	Aroclor-1254	0.0098	U	UG/L	0.0049	0.02	8082	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	11104-28-2	Aroclor-1221	0.02	U	UG/L	0.018	0.02	8082	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	11141-16-5	Aroclor-1232	0.016	U	UG/L	0.0082	0.02	8082	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	120-12-7	Anthracene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	120-82-1	1,2,4-Trichlorobenzene	0.22	U	UG/L	0.11	2	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	124-48-1	Dibromochloromethane	0.26	U	UG/L	0.13	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	12672-29-6	Aroclor-1248	0.011	U	UG/L	0.0053	0.02	8082	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	12674-11-2	Aroclor-1016	0.02	U	UG/L	0.015	0.02	8082	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	127-18-4	Tetrachloroethene	0.42	U	UG/L	0.21	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	129-00-0	Pyrene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	1330-20-7	Xylene, total	1	U	UG/L	0.5	2	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	156-59-2	cis-1,2-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	156-60-5	trans-1,2-Dichloroethene	0.5	U	UG/L	0.33	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	1634-04-4	Methyl-tert-butyl ether (MTBE)	1	U	UG/L	0.5	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	18540-29-9	Chromium (hexavalent)	21	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	18540-29-9_D	Chromium (hexavalent), Dissolved	13	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	191-24-2	Benzo(g,h,i)perylene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	205-99-2	Benzo(b)fluoranthene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	206-44-0	Fluoranthene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	207-08-9	Benzo(k)fluoranthene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	208-96-8	Acenaphthylene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	218-01-9	Chrysene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	309-00-2	Aldrin	0.0033	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	319-84-6	alpha-BHC	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	319-85-7	beta-BHC	0.0025	U	UG/L	0.0012	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	319-86-8	delta-BHC	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	33213-65-9	Endosulfan II	0.0033	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	50-29-3	4,4'-DDT	0.0023	U	UG/L	0.0011	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	50-32-8	Benzo(a)pyrene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	5103-71-9	alpha-Chlordane	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	5103-74-2	gamma-Chlordane	0.0049	U	UG/L	0.0025	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	53469-21-9	Aroclor-1242	0.02	U	UG/L	0.013	0.02	8082	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	53494-70-5	Endrin ketone	0.012	U	UG/L	0.0062	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	53-70-3	Dibenz(a,h)anthracene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	541-73-1	1,3-Dichlorobenzene	0.3	U	UG/L	0.15	2	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	56-23-5	Carbon tetrachloride	0.28	U	UG/L	0.14	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	56-55-3	Benzo(a)anthracene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	58-89-9	gamma-BHC (Lindane)	0.0049	U	UG/L	0.0025	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	591-78-6	2-Hexanone	0.96	U	UG/L	0.48	4	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	60-57-1	Dieldrin	0.0056	U	UG/L	0.0028	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	67-64-1	Acetone	2.8	U	UG/L	1.3	10	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	67-66-3	Chloroform	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	71-43-2	Benzene	0.34	U	UG/L	0.17	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	71-55-6	1,1,1-Trichloroethane	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	72-20-8	Endrin	0.0037	U	UG/L	0.0018	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	72-43-5	Methoxychlor	0.0037	U	UG/L	0.0018	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	72-54-8	4,4'-DDD	0.0054	U	UG/L	0.0027	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	72-55-9	4,4'-DDE	0.0078	U	UG/L	0.0039	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7421-93-4	Endrin aldehyde	0.0031	U	UG/L	0.0015	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7429-90-5_D	Aluminum, Dissolved	1740	J	UG/L	186	2000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-89-6	Iron	813	J	UG/L	110	800	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-89-6_D	Iron, Dissolved	293	J	UG/L	110	800	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-92-1	Lead	20	U	UG/L	6.8	100	6020	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-92-1_D	Lead, Dissolved	20	U	UG/L	6.8	100	6020	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-95-4	Magnesium	1360000	J	UG/L	196	2000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-95-4_D	Magnesium, Dissolved	1280000	=	UG/L	196	2000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-96-5	Manganese	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-96-5_D	Manganese, Dissolved	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-97-6	Mercury	0.074	UJ	UG/L	0.037	0.2	7470A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7439-97-6_D	Mercury, Dissolved	0.0439	J	UG/L	0.037	0.2	7470A	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-02-0	Nickel	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-02-0_D	Nickel, Dissolved	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-09-7	Potassium	544000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-09-7_D	Potassium, Dissolved	436000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-22-4	Silver	20.8	U	UG/L	10.4	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-22-4_D	Silver, Dissolved	20.8	U	UG/L	10.4	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-23-5	Sodium	15900000	=	UG/L	18000	30000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-23-5_D	Sodium, Dissolved	10800000	J	UG/L	18000	30000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-28-0	Thallium	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-28-0_D	Thallium, Dissolved	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-36-0	Antimony	100	U	UG/L	100	1000	6020	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-36-0_D	Antimony, Dissolved	100	U	UG/L	100	1000	6020	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-38-2	Arsenic	132	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-38-2_D	Arsenic, Dissolved	132.4	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-39-3	Barium	16.1	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-39-3_D	Barium, Dissolved	19.6	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-41-7	Beryllium	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-41-7_D	Beryllium, Dissolved	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-43-9	Cadmium	15.9	J	UG/L	14.4	100	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-43-9_D	Cadmium, Dissolved	28.8	U	UG/L	14.4	100	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-47-3	Chromium	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-47-3_D	Chromium, Dissolved	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-48-4	Cobalt	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-48-4_D	Cobalt, Dissolved	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-50-8	Copper	108	U	UG/L	54	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-50-8_D	Copper, Dissolved	108	U	UG/L	54	200	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-62-2	Vanadium	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-62-2_D	Vanadium, Dissolved	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-66-6	Zinc	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-66-6_D	Zinc, Dissolved	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-70-2	Calcium	523000	J	UG/L	780	2000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7440-70-2_D	Calcium, Dissolved	419000	=	UG/L	780	2000	6010B	TRUE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	74-83-9	Bromomethane	0.86	U	UG/L	0.43	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	74-87-3	Chloromethane	0.64	U	UG/L	0.32	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	74-97-5	Bromochloromethane	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-00-3	Chloroethane	1	U	UG/L	0.72	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-01-4	Vinyl chloride	0.36	U	UG/L	0.18	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-09-2	Methylene chloride	1.3	U	UG/L	0.66	5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-15-0	Carbon disulfide	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-25-2	Bromoform	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-27-4	Bromodichloromethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-34-3	1,1-Dichloroethane	0.3	U	UG/L	0.15	1	8260B	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-35-4	1,1-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-69-4	Trichlorofluoromethane (Freon-11)	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	75-71-8	Dichlorodifluoromethane (Freon-12)	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.46	U	UG/L	0.23	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	76-44-8	Heptachlor	0.0082	U	UG/L	0.0041	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7782-49-2	Selenium	164	UJ	UG/L	82	180	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	7782-49-2_D	Selenium, Dissolved	164	U	UG/L	82	180	6010B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	78-87-5	1,2-Dichloropropane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	78-93-3	2-Butanone	4	U	UG/L	2	4	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	79-00-5	1,1,2-Trichloroethane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	79-01-6	Trichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	79-20-9	Methyl acetate	0.76	U	UG/L	0.38	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	UG/L	0.13	1	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	8001-35-2	Toxaphene	0.37	U	UG/L	0.18	0.52	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	83-32-9	Acenaphthene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	85-01-8	Phenanthrene	0.059	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	86-73-7	Fluorene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	87-61-6	1,2,3-Trichlorobenzene	0.32	U	UG/L	0.16	2	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	90-12-0	1-Methylnaphthalene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	91-20-3	Naphthalene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	91-57-6	2-Methylnaphthalene	0.041	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	95-50-1	1,2-Dichlorobenzene	0.5	U	UG/L	0.25	2	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	959-98-8	Endosulfan I	0.0089	U	UG/L	0.0044	0.052	8081A	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	96-12-8	1,2-Dibromo-3-chloropropane	2	U	UG/L	1	2	8260B	FALSE
VWW06-SW004	VWW06-SW004-0211	0	0.8	03-Feb-11	SW	98-82-8	Isopropylbenzene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	100-41-4	Ethylbenzene	0.44	U	UG/L	0.22	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	100-42-5	Styrene	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	10061-01-5	cis-1,3-Dichloropropene	0.24	U	UG/L	0.12	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	10061-02-6	trans-1,3-Dichloropropene	0.6	U	UG/L	0.3	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	1024-57-3	Heptachlor epoxide	0.0029	U	UG/L	0.0014	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	1031-07-8	Endosulfan sulfate	0.002	U	UG/L	0.001	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	106-46-7	1,4-Dichlorobenzene	0.3	U	UG/L	0.15	3	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	106-93-4	1,2-Dibromoethane	0.22	U	UG/L	0.11	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	107-06-2	1,2-Dichloroethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	108-10-1	4-Methyl-2-pentanone	2	U	UG/L	1	4	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	108-87-2	Methylcyclohexane	0.54	U	UG/L	0.27	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	108-88-3	Toluene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	108-90-7	Chlorobenzene	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	110-82-7	Cyclohexane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	11096-82-5	Aroclor-1260	0.02	U	UG/L	0.01	0.02	8082	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	11097-69-1	Aroclor-1254	0.0098	U	UG/L	0.0049	0.02	8082	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	11104-28-2	Aroclor-1221	0.02	U	UG/L	0.018	0.02	8082	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	11141-16-5	Aroclor-1232	0.016	U	UG/L	0.0082	0.02	8082	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	120-12-7	Anthracene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	120-82-1	1,2,4-Trichlorobenzene	0.22	U	UG/L	0.11	2	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	124-48-1	Dibromochloromethane	0.26	U	UG/L	0.13	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	12672-29-6	Aroclor-1248	0.011	U	UG/L	0.0053	0.02	8082	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	12674-11-2	Aroclor-1016	0.02	U	UG/L	0.015	0.02	8082	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	127-18-4	Tetrachloroethene	0.42	U	UG/L	0.21	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	129-00-0	Pyrene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	1330-20-7	Xylene, total	1	U	UG/L	0.5	2	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	156-59-2	cis-1,2-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	156-60-5	trans-1,2-Dichloroethene	0.5	U	UG/L	0.33	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	1634-04-4	Methyl-tert-butyl ether (MTBE)	1	U	UG/L	0.5	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	18540-29-9	Chromium (hexavalent)	41	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	18540-29-9_D	Chromium (hexavalent), Dissolved	14	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	191-24-2	Benzo(g,h,i)perylene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	205-99-2	Benzo(b)fluoranthene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	206-44-0	Fluoranthene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	207-08-9	Benzo(k)fluoranthene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	208-96-8	Acenaphthylene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	218-01-9	Chrysene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	309-00-2	Aldrin	0.0033	U	UG/L	0.0016	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	319-84-6	alpha-BHC	0.0062	U	UG/L	0.0031	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	319-85-7	beta-BHC	0.0025	U	UG/L	0.0012	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	319-86-8	delta-BHC	0.0062	U	UG/L	0.0031	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	33213-65-9	Endosulfan II	0.0033	U	UG/L	0.0016	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	50-29-3	4,4'-DDT	0.0022	U	UG/L	0.0011	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	50-32-8	Benzo(a)pyrene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	5103-71-9	alpha-Chlordane	0.0062	U	UG/L	0.0031	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	5103-74-2	gamma-Chlordane	0.0049	U	UG/L	0.0025	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	53469-21-9	Aroclor-1242	0.02	U	UG/L	0.013	0.02	8082	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	53494-70-5	Endrin ketone	0.012	U	UG/L	0.0062	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	53-70-3	Dibenz(a,h)anthracene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	541-73-1	1,3-Dichlorobenzene	0.3	U	UG/L	0.15	2	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	56-23-5	Carbon tetrachloride	0.28	U	UG/L	0.14	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	56-55-3	Benzo(a)anthracene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	58-89-9	gamma-BHC (Lindane)	0.0049	U	UG/L	0.0025	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	591-78-6	2-Hexanone	0.96	U	UG/L	0.48	4	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	60-57-1	Dieldrin	0.0055	U	UG/L	0.0028	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	67-64-1	Acetone	2.6	U	UG/L	1.3	10	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	67-66-3	Chloroform	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	71-43-2	Benzene	0.34	U	UG/L	0.17	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	71-55-6	1,1,1-Trichloroethane	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	72-20-8	Endrin	0.0037	U	UG/L	0.0018	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	72-43-5	Methoxychlor	0.0037	U	UG/L	0.0018	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	72-54-8	4,4'-DDD	0.0053	U	UG/L	0.0027	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	72-55-9	4,4'-DDE	0.0078	U	UG/L	0.0039	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7421-93-4	Endrin aldehyde	0.0031	U	UG/L	0.0015	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7429-90-5_D	Aluminum, Dissolved	387	J	UG/L	186	2000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-89-6	Iron	590	J	UG/L	110	800	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-89-6_D	Iron, Dissolved	220	U	UG/L	110	800	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-92-1	Lead	20	U	UG/L	6.8	100	6020	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-92-1_D	Lead, Dissolved	20	U	UG/L	6.8	100	6020	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-95-4	Magnesium	1180000	J	UG/L	196	2000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-95-4_D	Magnesium, Dissolved	1080000	=	UG/L	196	2000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-96-5	Manganese	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-96-5_D	Manganese, Dissolved	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-97-6	Mercury	0.074	UJ	UG/L	0.037	0.2	7470A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7439-97-6_D	Mercury, Dissolved	0.0474	J	UG/L	0.037	0.2	7470A	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-02-0	Nickel	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-02-0_D	Nickel, Dissolved	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-09-7	Potassium	510000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-09-7_D	Potassium, Dissolved	498000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-22-4	Silver	5	U	UG/L	2.2	100	6020	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-22-4_D	Silver, Dissolved	20.8	U	UG/L	10.4	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-23-5	Sodium	11500000	=	UG/L	9000	15000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-23-5_D	Sodium, Dissolved	11000000	J	UG/L	9000	15000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-28-0	Thallium	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-28-0_D	Thallium, Dissolved	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-36-0	Antimony	20	U	UG/L	20	200	6020	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-36-0_D	Antimony, Dissolved	20	U	UG/L	20	200	6020	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-38-2	Arsenic	132	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-38-2_D	Arsenic, Dissolved	132.4	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-39-3	Barium	13.7	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-39-3_D	Barium, Dissolved	15.5	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-41-7	Beryllium	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-41-7_D	Beryllium, Dissolved	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-43-9	Cadmium	20	U	UG/L	8.4	100	6020	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-43-9_D	Cadmium, Dissolved	28.8	U	UG/L	14.4	100	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-47-3	Chromium	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-47-3_D	Chromium, Dissolved	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-48-4	Cobalt	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-48-4_D	Cobalt, Dissolved	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-50-8	Copper	108	U	UG/L	54	200	6010B	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-50-8_D	Copper, Dissolved	108	U	UG/L	54	200	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-62-2	Vanadium	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-62-2_D	Vanadium, Dissolved	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-66-6	Zinc	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-66-6_D	Zinc, Dissolved	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-70-2	Calcium	489000	J	UG/L	780	2000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7440-70-2_D	Calcium, Dissolved	484000	=	UG/L	780	2000	6010B	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	74-83-9	Bromomethane	0.86	U	UG/L	0.43	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	74-87-3	Chloromethane	0.64	U	UG/L	0.32	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	74-97-5	Bromochloromethane	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-00-3	Chloroethane	1	U	UG/L	0.72	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-01-4	Vinyl chloride	0.36	U	UG/L	0.18	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-09-2	Methylene chloride	1.3	U	UG/L	0.66	5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-15-0	Carbon disulfide	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-25-2	Bromoform	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-27-4	Bromodichloromethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-34-3	1,1-Dichloroethane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-35-4	1,1-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-69-4	Trichlorofluoromethane (Freon-11)	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	75-71-8	Dichlorodifluoromethane (Freon-12)	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.46	U	UG/L	0.23	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	76-44-8	Heptachlor	0.0081	U	UG/L	0.0041	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7782-49-2	Selenium	164	UJ	UG/L	82	180	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	7782-49-2_D	Selenium, Dissolved	164	U	UG/L	82	180	6010B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	78-87-5	1,2-Dichloropropane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	78-93-3	2-Butanone	4	U	UG/L	2	4	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	79-00-5	1,1,2-Trichloroethane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	79-01-6	Trichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	79-20-9	Methyl acetate	0.76	U	UG/L	0.38	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	UG/L	0.13	1	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	8001-35-2	Toxaphene	0.37	U	UG/L	0.18	0.51	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	83-32-9	Acenaphthene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	85-01-8	Phenanthrene	0.064	=	UG/L	0.02	0.051	8270C_SIM	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	86-73-7	Fluorene	0.043	J	UG/L	0.02	0.051	8270C_SIM	TRUE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	87-61-6	1,2,3-Trichlorobenzene	0.32	U	UG/L	0.16	2	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	90-12-0	1-Methylnaphthalene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	91-20-3	Naphthalene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	91-57-6	2-Methylnaphthalene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	95-50-1	1,2-Dichlorobenzene	0.5	U	UG/L	0.25	2	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	959-98-8	Endosulfan I	0.0088	U	UG/L	0.0044	0.051	8081A	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	96-12-8	1,2-Dibromo-3-chloropropane	2	U	UG/L	1	2	8260B	FALSE
VWW06-SW005	VWW06-SW005-0211	0	0.2	03-Feb-11	SW	98-82-8	Isopropylbenzene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	100-41-4	Ethylbenzene	0.44	U	UG/L	0.22	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	100-42-5	Styrene	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	10061-01-5	cis-1,3-Dichloropropene	0.24	U	UG/L	0.12	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	10061-02-6	trans-1,3-Dichloropropene	0.6	U	UG/L	0.3	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	1024-57-3	Heptachlor epoxide	0.0029	U	UG/L	0.0014	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	1031-07-8	Endosulfan sulfate	0.0021	U	UG/L	0.001	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	106-46-7	1,4-Dichlorobenzene	0.3	U	UG/L	0.15	3	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	106-93-4	1,2-Dibromoethane	0.22	U	UG/L	0.11	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	107-06-2	1,2-Dichloroethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	108-10-1	4-Methyl-2-pentanone	2	U	UG/L	1	4	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	108-87-2	Methylcyclohexane	0.54	U	UG/L	0.27	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	108-88-3	Toluene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	108-90-7	Chlorobenzene	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	110-82-7	Cyclohexane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	11096-82-5	Aroclor-1260	0.021	U	UG/L	0.01	0.021	8082	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	11097-69-1	Aroclor-1254	0.01	U	UG/L	0.005	0.021	8082	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	11104-28-2	Aroclor-1221	0.021	U	UG/L	0.018	0.021	8082	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	11141-16-5	Aroclor-1232	0.016	U	UG/L	0.0083	0.021	8082	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	120-12-7	Anthracene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	120-82-1	1,2,4-Trichlorobenzene	0.22	U	UG/L	0.11	2	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	124-48-1	Dibromochloromethane	0.26	U	UG/L	0.13	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	12672-29-6	Aroclor-1248	0.011	U	UG/L	0.0054	0.021	8082	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	12674-11-2	Aroclor-1016	0.021	U	UG/L	0.015	0.021	8082	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	127-18-4	Tetrachloroethene	0.42	U	UG/L	0.21	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	129-00-0	Pyrene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	1330-20-7	Xylene, total	1	U	UG/L	0.5	2	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	156-59-2	cis-1,2-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	156-60-5	trans-1,2-Dichloroethene	0.5	U	UG/L	0.33	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	1634-04-4	Methyl-tert-butyl ether (MTBE)	1	U	UG/L	0.5	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	18540-29-9	Chromium (hexavalent)	12	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	18540-29-9_D	Chromium (hexavalent), Dissolved	13	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	191-24-2	Benzo(g,h,i)perylene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	193-39-5	Indeno(1,2,3-cd)pyrene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	205-99-2	Benzo(b)fluoranthene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	206-44-0	Fluoranthene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	207-08-9	Benzo(k)fluoranthene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	208-96-8	Acenaphthylene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	218-01-9	Chrysene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	309-00-2	Aldrin	0.0033	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	319-84-6	alpha-BHC	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	319-85-7	beta-BHC	0.0025	U	UG/L	0.0012	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	319-86-8	delta-BHC	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	33213-65-9	Endosulfan II	0.0033	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	50-29-3	4,4'-DDT	0.0023	U	UG/L	0.0011	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	50-32-8	Benzo(a)pyrene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	5103-71-9	alpha-Chlordane	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	5103-74-2	gamma-Chlordane	0.005	U	UG/L	0.0025	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	53469-21-9	Aroclor-1242	0.021	U	UG/L	0.013	0.021	8082	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	53494-70-5	Endrin ketone	0.012	U	UG/L	0.0062	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	53-70-3	Dibenz(a,h)anthracene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	541-73-1	1,3-Dichlorobenzene	0.3	U	UG/L	0.15	2	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	56-23-5	Carbon tetrachloride	0.28	U	UG/L	0.14	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	56-55-3	Benzo(a)anthracene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	58-89-9	gamma-BHC (Lindane)	0.005	U	UG/L	0.0025	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	591-78-6	2-Hexanone	0.96	U	UG/L	0.48	4	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	60-57-1	Dieldrin	0.0056	U	UG/L	0.0028	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	67-64-1	Acetone	3.6	U	UG/L	1.3	10	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	67-66-3	Chloroform	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	71-43-2	Benzene	0.34	U	UG/L	0.17	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	71-55-6	1,1,1-Trichloroethane	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	72-20-8	Endrin	0.0037	U	UG/L	0.0019	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	72-43-5	Methoxychlor	0.0037	U	UG/L	0.0019	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	72-54-8	4,4'-DDD	0.0054	U	UG/L	0.0027	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	72-55-9	4,4'-DDE	0.0079	U	UG/L	0.0039	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7421-93-4	Endrin aldehyde	0.0031	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7429-90-5_D	Aluminum, Dissolved	1450	J	UG/L	186	2000	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-89-6	Iron	220	U	UG/L	110	800	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-89-6_D	Iron, Dissolved	220	U	UG/L	110	800	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-92-1	Lead	20	U	UG/L	6.8	100	6020	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-92-1_D	Lead, Dissolved	20	U	UG/L	6.8	100	6020	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-95-4	Magnesium	1360000	J	UG/L	196	2000	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-95-4_D	Magnesium, Dissolved	1290000	=	UG/L	196	2000	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-96-5	Manganese	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-96-5_D	Manganese, Dissolved	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-97-6	Mercury	0.074	UJ	UG/L	0.037	0.2	7470A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7439-97-6_D	Mercury, Dissolved	0.074	UJ	UG/L	0.037	0.2	7470A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-02-0	Nickel	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-02-0_D	Nickel, Dissolved	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-09-7	Potassium	512000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-09-7_D	Potassium, Dissolved	435000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-22-4	Silver	20.8	U	UG/L	10.4	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-22-4_D	Silver, Dissolved	20.8	U	UG/L	10.4	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-23-5	Sodium	11300000	=	UG/L	9000	15000	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-23-5_D	Sodium, Dissolved	10700000	J	UG/L	9000	15000	6010B	TRUE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-28-0	Thallium	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-28-0_D	Thallium, Dissolved	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-36-0	Antimony	100	U	UG/L	100	1000	6020	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-36-0_D	Antimony, Dissolved	100	U	UG/L	100	1000	6020	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-38-2	Arsenic	132	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-38-2_D	Arsenic, Dissolved	132.4	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-39-3	Barium	7.67	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-39-3_D	Barium, Dissolved	8.79	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-41-7	Beryllium	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-41-7_D	Beryllium, Dissolved	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-43-9	Cadmium	28.8	U	UG/L	14.4	100	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-43-9_D	Cadmium, Dissolved	28.8	U	UG/L	14.4	100	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-47-3	Chromium	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-47-3_D	Chromium, Dissolved	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-48-4	Cobalt	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-48-4_D	Cobalt, Dissolved	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-50-8	Copper	108	U	UG/L	54	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-50-8_D	Copper, Dissolved	108	U	UG/L	54	200	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-62-2	Vanadium	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-62-2_D	Vanadium, Dissolved	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-66-6	Zinc	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-66-6_D	Zinc, Dissolved	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-70-2	Calcium	498000	J	UG/L	780	2000	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7440-70-2_D	Calcium, Dissolved	416000	=	UG/L	780	2000	6010B	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	74-83-9	Bromomethane	0.86	U	UG/L	0.43	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	74-87-3	Chloromethane	0.64	U	UG/L	0.32	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	74-97-5	Bromochloromethane	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-00-3	Chloroethane	1	U	UG/L	0.72	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-01-4	Vinyl chloride	0.36	U	UG/L	0.18	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-09-2	Methylene chloride	1.3	U	UG/L	0.66	5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-15-0	Carbon disulfide	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-25-2	Bromoform	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-27-4	Bromodichloromethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-34-3	1,1-Dichloroethane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-35-4	1,1-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-69-4	Trichlorofluoromethane (Freon-11)	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	75-71-8	Dichlorodifluoromethane (Freon-12)	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.46	U	UG/L	0.23	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	76-44-8	Heptachlor	0.0082	U	UG/L	0.0041	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7782-49-2	Selenium	164	UJ	UG/L	82	180	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	7782-49-2_D	Selenium, Dissolved	164	U	UG/L	82	180	6010B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	78-87-5	1,2-Dichloropropane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	78-93-3	2-Butanone	4	U	UG/L	2	4	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	79-00-5	1,1,2-Trichloroethane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	79-01-6	Trichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	79-20-9	Methyl acetate	0.76	U	UG/L	0.38	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	UG/L	0.13	1	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	8001-35-2	Toxaphene	0.37	U	UG/L	0.19	0.52	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	83-32-9	Acenaphthene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	85-01-8	Phenanthrene	0.069	=	UG/L	0.021	0.052	8270C_SIM	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	86-73-7	Fluorene	0.047	J	UG/L	0.021	0.052	8270C_SIM	TRUE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	87-61-6	1,2,3-Trichlorobenzene	0.32	U	UG/L	0.16	2	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	90-12-0	1-Methylnaphthalene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	91-20-3	Naphthalene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	91-57-6	2-Methylnaphthalene	0.042	U	UG/L	0.021	0.052	8270C_SIM	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	95-50-1	1,2-Dichlorobenzene	0.5	U	UG/L	0.25	2	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	959-98-8	Endosulfan I	0.0089	U	UG/L	0.0044	0.052	8081A	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	96-12-8	1,2-Dibromo-3-chloropropane	2	U	UG/L	1	2	8260B	FALSE
VWW06-SW006	VWW06-SW006-0211	0	0.4	03-Feb-11	SW	98-82-8	Isopropylbenzene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	100-41-4	Ethylbenzene	0.44	U	UG/L	0.22	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	100-42-5	Styrene	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	10061-01-5	cis-1,3-Dichloropropene	0.24	U	UG/L	0.12	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	10061-02-6	trans-1,3-Dichloropropene	0.6	U	UG/L	0.3	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	1024-57-3	Heptachlor epoxide	0.0029	U	UG/L	0.0014	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	1031-07-8	Endosulfan sulfate	0.0021	U	UG/L	0.001	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	106-46-7	1,4-Dichlorobenzene	0.3	U	UG/L	0.15	3	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	106-93-4	1,2-Dibromoethane	0.22	U	UG/L	0.11	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	107-06-2	1,2-Dichloroethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	108-10-1	4-Methyl-2-pentanone	2	U	UG/L	1	4	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	108-87-2	Methylcyclohexane	0.54	U	UG/L	0.27	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	108-88-3	Toluene	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	108-90-7	Chlorobenzene	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	110-82-7	Cyclohexane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	11096-82-5	Aroclor-1260	0.021	U	UG/L	0.01	0.021	8082	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	11097-69-1	Aroclor-1254	0.0099	U	UG/L	0.0049	0.021	8082	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	11104-28-2	Aroclor-1221	0.021	U	UG/L	0.018	0.021	8082	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	11141-16-5	Aroclor-1232	0.016	U	UG/L	0.0082	0.021	8082	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	120-12-7	Anthracene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	120-82-1	1,2,4-Trichlorobenzene	0.22	U	UG/L	0.11	2	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	124-48-1	Dibromochloromethane	0.26	U	UG/L	0.13	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	12672-29-6	Aroclor-1248	0.011	U	UG/L	0.0054	0.021	8082	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	12674-11-2	Aroclor-1016	0.021	U	UG/L	0.015	0.021	8082	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	127-18-4	Tetrachloroethene	0.42	U	UG/L	0.21	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	129-00-0	Pyrene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	1330-20-7	Xylene, total	1	U	UG/L	0.5	2	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	156-59-2	cis-1,2-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	156-60-5	trans-1,2-Dichloroethene	0.5	U	UG/L	0.33	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	1634-04-4	Methyl-tert-butyl ether (MTBE)	1	U	UG/L	0.5	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	18540-29-9	Chromium (hexavalent)	22	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	18540-29-9_D	Chromium (hexavalent), Dissolved	9	J	UG/L	3.5	10	7196A	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	191-24-2	Benzo(g,h,i)perylene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	193-39-5	Indeno(1,2,3-cd)pyrene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	205-99-2	Benzo(b)fluoranthene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	206-44-0	Fluoranthene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	207-08-9	Benzo(k)fluoranthene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	208-96-8	Acenaphthylene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	218-01-9	Chrysene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	309-00-2	Aldrin	0.0033	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	319-84-6	alpha-BHC	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	319-85-7	beta-BHC	0.0025	U	UG/L	0.0012	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	319-86-8	delta-BHC	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	33213-65-9	Endosulfan II	0.0033	U	UG/L	0.0016	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	50-29-3	4,4'-DDT	0.0023	U	UG/L	0.0011	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	50-32-8	Benzo(a)pyrene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	5103-71-9	alpha-Chlordane	0.0062	U	UG/L	0.0031	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	5103-74-2	gamma-Chlordane	0.0049	U	UG/L	0.0025	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	53469-21-9	Aroclor-1242	0.021	U	UG/L	0.013	0.021	8082	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	53494-70-5	Endrin ketone	0.012	U	UG/L	0.0062	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	53-70-3	Dibenz(a,h)anthracene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	541-73-1	1,3-Dichlorobenzene	0.3	U	UG/L	0.15	2	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	56-23-5	Carbon tetrachloride	0.28	U	UG/L	0.14	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	56-55-3	Benzo(a)anthracene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	58-89-9	gamma-BHC (Lindane)	0.0049	U	UG/L	0.0025	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	591-78-6	2-Hexanone	0.96	U	UG/L	0.48	4	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	60-57-1	Dieldrin	0.0056	U	UG/L	0.0028	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	67-64-1	Acetone	2.6	U	UG/L	1.3	10	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	67-66-3	Chloroform	0.32	U	UG/L	0.16	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	71-43-2	Benzene	0.34	U	UG/L	0.17	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	71-55-6	1,1,1-Trichloroethane	0.28	U	UG/L	0.14	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	72-20-8	Endrin	0.0037	U	UG/L	0.0018	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	72-43-5	Methoxychlor	0.0037	U	UG/L	0.0018	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	72-54-8	4,4'-DDD	0.0054	U	UG/L	0.0027	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	72-55-9	4,4'-DDE	0.0078	U	UG/L	0.0039	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7421-93-4	Endrin aldehyde	0.0031	U	UG/L	0.0015	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-89-6	Iron	220	U	UG/L	110	800	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-89-6_D	Iron, Dissolved	220	U	UG/L	110	800	6010B	FALSE

Attachment E-8
Analytical Data Used in the SWMU 6 HHRA (Soil, Sediment, Surface Water)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Upper Depth	Lower Depth	Collection Date	Matrix	CAS	Chemical	Result	Qualifier	Units	Detection Limit	Reporting Limit	Method	Detected
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-92-1	Lead	20	U	UG/L	6.8	100	6020	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-92-1_D	Lead, Dissolved	20	U	UG/L	6.8	100	6020	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-95-4	Magnesium	1260000	J	UG/L	196	2000	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-95-4_D	Magnesium, Dissolved	1290000	=	UG/L	196	2000	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-96-5	Manganese	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-96-5_D	Manganese, Dissolved	14	U	UG/L	7	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-97-6	Mercury	0.074	UJ	UG/L	0.037	0.2	7470A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7439-97-6_D	Mercury, Dissolved	0.074	UJ	UG/L	0.037	0.2	7470A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-02-0	Nickel	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-02-0_D	Nickel, Dissolved	37.2	U	UG/L	18.6	82	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-09-7	Potassium	480000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-09-7_D	Potassium, Dissolved	470000	=	UG/L	1430	10000	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-22-4	Silver	20.8	U	UG/L	10.4	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-22-4_D	Silver, Dissolved	20.8	U	UG/L	10.4	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-23-5	Sodium	10800000	=	UG/L	18000	30000	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-23-5_D	Sodium, Dissolved	10900000	J	UG/L	9000	15000	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-28-0	Thallium	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-28-0_D	Thallium, Dissolved	176	U	UG/L	88	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-36-0	Antimony	100	U	UG/L	100	1000	6020	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-36-0_D	Antimony, Dissolved	100	U	UG/L	100	1000	6020	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-38-2	Arsenic	132	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-38-2_D	Arsenic, Dissolved	132.4	U	UG/L	66.2	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-39-3	Barium	5.74	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-39-3_D	Barium, Dissolved	6.48	J	UG/L	4.4	200	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-41-7	Beryllium	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-41-7_D	Beryllium, Dissolved	4.8	U	UG/L	2.4	73	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-43-9	Cadmium	28.8	U	UG/L	14.4	100	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-43-9_D	Cadmium, Dissolved	28.8	U	UG/L	14.4	100	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-47-3	Chromium	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-47-3_D	Chromium, Dissolved	17.2	U	UG/L	8.6	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-48-4	Cobalt	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-48-4_D	Cobalt, Dissolved	14.8	U	UG/L	7.4	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-50-8	Copper	108	U	UG/L	54	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-50-8_D	Copper, Dissolved	108	U	UG/L	54	200	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-62-2	Vanadium	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-62-2_D	Vanadium, Dissolved	17.6	U	UG/L	8.8	180	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-66-6	Zinc	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-66-6_D	Zinc, Dissolved	160	U	UG/L	80	400	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-70-2	Calcium	464000	J	UG/L	780	2000	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7440-70-2_D	Calcium, Dissolved	465000	=	UG/L	780	2000	6010B	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	74-83-9	Bromomethane	0.86	U	UG/L	0.43	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	74-87-3	Chloromethane	0.64	U	UG/L	0.32	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	74-97-5	Bromochloromethane	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-00-3	Chloroethane	1	U	UG/L	0.72	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-01-4	Vinyl chloride	0.36	U	UG/L	0.18	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-09-2	Methylene chloride	1.3	U	UG/L	0.66	5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-15-0	Carbon disulfide	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-25-2	Bromoform	0.38	U	UG/L	0.19	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-27-4	Bromodichloromethane	0.3	U	UG/L	0.15	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-34-3	1,1-Dichloroethane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-35-4	1,1-Dichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-69-4	Trichlorofluoromethane (Freon-11)	0.24	U	UG/L	0.12	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	75-71-8	Dichlorodifluoromethane (Freon-12)	0.34	U	UG/L	0.17	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	76-13-1	-Trichloro-1,2,2-trifluoroethane (Freon	0.46	U	UG/L	0.23	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	76-44-8	Heptachlor	0.0082	U	UG/L	0.0041	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7782-49-2	Selenium	164	UJ	UG/L	82	180	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	7782-49-2_D	Selenium, Dissolved	164	U	UG/L	82	180	6010B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	78-87-5	1,2-Dichloropropane	0.3	U	UG/L	0.15	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	78-93-3	2-Butanone	4	U	UG/L	2	4	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	79-00-5	1,1,2-Trichloroethane	0.4	U	UG/L	0.2	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	79-01-6	Trichloroethene	0.38	U	UG/L	0.19	0.5	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	79-20-9	Methyl acetate	0.76	U	UG/L	0.38	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	79-34-5	1,1,2,2-Tetrachloroethane	0.26	U	UG/L	0.13	1	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	8001-35-2	Toxaphene	0.37	U	UG/L	0.18	0.52	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	83-32-9	Acenaphthene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	85-01-8	Phenanthrene	0.079	J	UG/L	0.02	0.051	8270C_SIM	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	86-73-7	Fluorene	0.055	J	UG/L	0.02	0.051	8270C_SIM	TRUE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	87-61-6	1,2,3-Trichlorobenzene	0.32	U	UG/L	0.16	2	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	90-12-0	1-Methylnaphthalene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	91-20-3	Naphthalene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	91-57-6	2-Methylnaphthalene	0.041	U	UG/L	0.02	0.051	8270C_SIM	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	95-50-1	1,2-Dichlorobenzene	0.5	U	UG/L	0.25	2	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	959-98-8	Endosulfan I	0.0089	U	UG/L	0.0044	0.052	8081A	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	96-12-8	1,2-Dibromo-3-chloropropane	2	U	UG/L	1	2	8260B	FALSE
VWW06-SW007	VWW06-SW007-0211	0	0.36	03-Feb-11	SW	98-82-8	Isopropylbenzene	0.28	U	UG/L	0.14	1	8260B	FALSE

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	2.2	PG_G	J	0.20	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	2.0	PG_G	U	0.20	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	0.89	PG_G	J	0.20	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	9.7	PG_G	J	0.91	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	9.9	PG_G	U	1.0	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	7.2	PG_G	J	1.0	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	9.9	PG_G	U	0.96	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	24	PG_G		1.0	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	9.9	PG_G	U	1.1	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	9.9	PG_G	U	0.49	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	16	PG_G	J	1.0	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (13/12)	13&12	20	PG_G	U	1.0	20	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	9.9	PG_G	U	0.88	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	9.9	PG_G	U	0.81	9.9	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	5.9	PG_G	J	0.23	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	9.3	PG_G	J	0.19	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (30/18)	30&18	26	PG_G	J	0.16	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	9.8	PG_G	J	0.27	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (28/20)	28&20	230	PG_G		0.34	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (21/33)	21&33	23	PG_G	J	0.32	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	31	PG_G		0.35	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	0.99	PG_G	U	0.32	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	0.99	PG_G	U	0.14	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	12	PG_G	J	0.33	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (26/29)	26&29	34	PG_G	J	0.33	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	3.5	PG_G	J	0.14	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	140	PG_G		0.32	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	23	PG_G		0.13	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	2.2	PG_G	J	0.33	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	2.0	PG_G	U	0.35	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	15	PG_G	J	0.31	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	3.1	PG_G	J	0.28	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	0.99	PG_G	U	0.35	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	0.99	PG_G	U	0.32	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (40/71)	40&71	31	PG_G	J	0.25	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	0.99	PG_G	U	0.35	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	9.5	PG_G	J	0.28	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	0.99	PG_G	U	0.31	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (44/47/65)	44&47&65	420	PG_G		0.25	3.0	60
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	13	PG_G	J	0.32	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	3.3	PG_G	J	0.32	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	2.5	PG_G	J	0.27	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (69/49)	69&49	520	PG_G		0.22	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (50/53)	50&53	43	PG_G		0.26	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	8.8	PG_G	J	0.24	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	1900	PG_G		0.27	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	3.2	PG_G	J	0.15	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	2.0	PG_G	U	0.73	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	37	PG_G		0.75	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	33	PG_G		0.70	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	0.99	PG_G	U	0.70	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (59/62/75)	59&62&75	52	PG_G	J	0.20	3.0	60
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	160	PG_G		0.73	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	2300	PG_G		0.69	4.0	80
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	57	PG_G		0.63	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	170	PG_G		0.18	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	1300	PG_G		0.72	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	13	PG_G	J	0.67	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	23	PG_G		0.65	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	28	PG_G		0.68	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	0.99	PG_G	U	0.20	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	15	PG_G		0.62	0.99	2.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	0.99	PG_G	U	0.76	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	19	PG_G	J	0.65	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	0.99	PG_G	U	0.63	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	0.99	PG_G	U	0.61	0.99	2.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	16	PG_G	J	1.8	1.8	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	1.5	PG_G	U	1.5	1.5	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	97	PG_G		1.7	1.7	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (117/116/85)	117&116&85	930	PG_G		1.2	3.0	60
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	710	PG_G		1.3	5.9	120
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (88/91)	88&91	180	PG_G		1.5	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	1.6	PG_G	U	1.6	1.6	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (113/90/101)	113&90&101	3800	PG_G		1.3	3.0	60
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	880	PG_G		1.6	1.6	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (93/100)	93&100	27	PG_G	J	1.4	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	1.6	PG_G	U	1.6	1.6	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	780	PG_G		1.5	1.5	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	3.3	PG_G	J	0.11	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (98/102)	98&102	2.2	PG_G	J	1.5	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	27	PG_G		1.4	1.4	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	0.99	PG_G	U	0.13	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	2.0	PG_G	U	1.4	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	550	PG_G		0.92	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (107/124)	107&124	210	PG_G		1.2	5.9	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (110/115)	110&115	1200	PG_G		1.2	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	6.5	PG_G	J	1.1	1.1	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	1.4	PG_G	U	1.4	1.4	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	170	PG_G		1.1	1.1	2.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	42	PG_G		1.1	1.1	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	2.7	PG_G	J	1.1	1.1	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	1.2	PG_G	U	1.2	1.2	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	82	PG_G	J	1.1	1.1	2.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	26	PG_G		1.3	1.3	2.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	13	PG_G	J	1.2	1.2	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (128/166)	128&166	990	PG_G		0.35	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	320	PG_G		0.47	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	3.9	PG_G	J	0.44	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	120	PG_G		0.44	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	63	PG_G		0.43	0.99	20

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (134/143)	134&143	14	PG_G	J	0.47	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (151/135)	151&135	320	PG_G		0.40	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	48	PG_G		0.31	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	240	PG_G		0.31	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (139/140)	139&140	100	PG_G		0.38	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	580	PG_G		0.50	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	0.99	PG_G	U	0.51	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	76	PG_G		0.39	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	0.99	PG_G	U	0.30	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	960	PG_G		0.31	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (147/149)	147&149	390	PG_G		0.38	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	4.2	PG_G	J	0.39	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	1.0	PG_G	J	0.29	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	0.99	PG_G	U	0.28	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	61	PG_G		0.37	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	1.8	PG_G	J	0.37	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (156/157)	156&157	1500	PG_G		1.3	2.0	4.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	790	PG_G		0.31	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	1.2	PG_G	U	1.2	1.2	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	0.99	PG_G	U	0.39	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	0.99	PG_G	U	0.39	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	58	PG_G		1.2	1.2	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	87	PG_G	J	0.40	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	0.99	PG_G	U	0.33	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	500	PG_G		0.98	0.99	2.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	1.3	PG_G	U	1.3	1.3	2.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	1000	PG_G		0.88	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (171/173)	171&173	300	PG_G		0.90	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	190	PG_G		0.84	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	49	PG_G		1.0	1.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	20	PG_G	J	0.15	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	5.1	PG_G	J	0.11	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	280	PG_G		0.87	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	56	PG_G		0.16	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	14	PG_G	J	0.12	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (180/193)	180&193	1700	PG_G		0.71	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	27	PG_G		0.72	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	4.7	PG_G	J	0.16	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	450	PG_G		0.54	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	0.99	PG_G	U	0.13	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	39	PG_G		0.92	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	0.99	PG_G	U	0.12	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	730	PG_G		0.13	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	4.5	PG_G	J	0.17	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	35	PG_G		0.30	0.99	2.0
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	8.7	PG_G	J	0.58	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	43	PG_G		0.64	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	0.99	PG_G	U	0.67	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	150	PG_G		0.43	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	65	PG_G		0.44	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	75	PG_G		0.20	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	7.6	PG_G	J	0.13	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (198/199)	198&199	230	PG_G		0.23	2.0	40
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	1.4	PG_G	J	0.21	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	24	PG_G		0.16	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	37	PG_G		0.18	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	160	PG_G		0.22	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	0.99	PG_G	U	0.16	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	6.3	PG_G	J	0.31	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	61	PG_G		0.32	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	10	PG_G	J	0.20	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	24	PG_G		0.18	0.99	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	21	PG_G		0.21	2.0	20
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	3800	PG_G		4.4	10	100
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	2500	PG_G		3.7	5.0	10
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	8200	PG_G		3.4	5.0	10
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (138/163/129)	138&163&129	9100	PG_G		1.3	15	300
VWW06-FS01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (153/168)	153&168	7400	PG_G		1.1	10	200
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	2.8	PG_G	J	0.33	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	1.9	PG_G	U	0.33	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	0.91	PG_G	J	0.32	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	12	PG_G	J	2.3	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	9.4	PG_G	U	2.0	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	8.4	PG_G	J	2.0	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	9.4	PG_G	U	1.9	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	25	PG_G		2.0	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	9.4	PG_G	U	2.2	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	9.4	PG_G	U	1.3	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	25	PG_G		2.1	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (13/12)	13&12	19	PG_G	U	2.1	19	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	9.4	PG_G	U	1.8	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	9.4	PG_G	U	1.7	9.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	6.9	PG_G	J	0.37	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	11	PG_G	J	0.30	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (30/18)	30&18	28	PG_G	J	0.25	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	11	PG_G	J	0.42	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (28/20)	28&20	260	PG_G		0.58	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (21/33)	21&33	26	PG_G	J	0.55	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	35	PG_G		0.60	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	0.94	PG_G	U	0.55	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	0.94	PG_G	U	0.23	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	13	PG_G	J	0.57	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (26/29)	26&29	39	PG_G		0.56	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	3.3	PG_G	J	0.22	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	160	PG_G		0.54	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	26	PG_G		0.21	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	1.5	PG_G	J	0.57	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	1.9	PG_G	U	0.60	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	17	PG_G	J	0.53	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	3.5	PG_G	J	0.50	0.94	19

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	0.94	PG_G	U	0.60	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	0.94	PG_G	U	0.54	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (40/71)	40&71	29	PG_G	J	0.74	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	1.0	PG_G	U	1.0	1.0	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	9.5	PG_G	J	0.83	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	0.94	PG_G	U	0.93	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (44/47/65)	44&47&65	440	PG_G		0.74	2.8	57
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	17	PG_G	J	0.94	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	3.8	PG_G	J	0.93	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	1.8	PG_G	J	0.80	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (69/49)	69&49	560	PG_G		0.65	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (50/53)	50&53	47	PG_G		0.76	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	7.7	PG_G	J	0.72	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	3.8	PG_G	J	0.26	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	1.9	PG_G	U	1.0	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	39	PG_G		1.1	1.1	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	31	PG_G	J	0.98	0.98	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	0.97	PG_G	U	0.97	0.97	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (59/62/75)	59&62&75	54	PG_G	J	0.58	2.8	57
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	180	PG_G		1.0	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	2400	PG_G		0.96	3.8	76
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	62	PG_G		0.89	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	180	PG_G		0.54	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	1400	PG_G		1.0	1.0	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	15	PG_G	J	0.94	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	22	PG_G	J	0.90	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	32	PG_G		0.95	0.95	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	0.94	PG_G	U	0.60	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	17	PG_G		0.84	0.94	1.9
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	1.1	PG_G	U	1.1	1.1	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	21	PG_G	J	0.91	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	0.94	PG_G	U	0.88	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	2.8	PG_G	J	0.84	0.94	1.9
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	15	PG_G	J	2.4	2.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	1.9	PG_G	U	1.9	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	110	PG_G		2.2	2.2	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (117/116/85)	117&116&85	1100	PG_G		1.6	2.8	57
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	820	PG_G		1.7	5.6	110
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (88/91)	88&91	190	PG_G		1.9	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	2.1	PG_G	U	2.1	2.1	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (113/90/101)	113&90&101	4300	PG_G		1.7	2.8	57
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	990	PG_G		2.0	2.0	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (93/100)	93&100	30	PG_G	J	1.9	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	2.1	PG_G	J	2.1	2.1	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	850	PG_G		1.9	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	3.9	PG_G	J	0.26	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (98/102)	98&102	2.0	PG_G	U	2.0	2.0	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	29	PG_G		1.8	1.8	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	0.94	PG_G	U	0.34	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	1.9	PG_G	U	1.8	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	630	PG_G		1.2	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (107/124)	107&124	250	PG_G		1.5	5.6	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (110/115)	110&115	1400	PG_G		1.6	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	6.6	PG_G	J	1.4	1.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	1.9	PG_G	U	1.9	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	200	PG_G		1.4	1.4	1.9
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	50	PG_G		1.4	1.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	2.4	PG_G	J	1.4	1.4	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	1.5	PG_G	U	1.5	1.5	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	120	PG_G	J	1.4	1.4	1.9
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	20	PG_G		1.6	1.6	1.9
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	13	PG_G	J	1.5	1.5	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (128/166)	128&166	1200	PG_G		0.82	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	380	PG_G		1.1	1.1	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	4.1	PG_G	J	1.0	1.0	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	140	PG_G		1.0	1.0	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	75	PG_G		1.0	1.0	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (134/143)	134&143	17	PG_G		1.1	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (151/135)	151&135	380	PG_G		0.95	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	56	PG_G		0.73	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	270	PG_G		0.74	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (139/140)	139&140	120	PG_G		0.89	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	700	PG_G		1.2	1.2	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	1.2	PG_G	U	1.2	1.2	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	89	PG_G		0.93	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	0.94	PG_G	U	0.71	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	1100	PG_G		0.74	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (147/149)	147&149	450	PG_G		0.91	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	5.2	PG_G	J	0.91	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	0.94	PG_G	U	0.69	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	0.94	PG_G	U	0.67	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	73	PG_G		0.88	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	2.1	PG_G	J	0.87	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (156/157)	156&157	1700	PG_G		1.7	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	950	PG_G		0.73	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	1.6	PG_G	U	1.6	1.6	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	0.94	PG_G	U	0.91	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	0.94	PG_G	U	0.92	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	69	PG_G		1.6	1.6	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	140	PG_G	J	0.94	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	1.3	PG_G	J	0.79	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	590	PG_G		1.3	1.3	1.9
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	1.7	PG_G	U	1.7	1.7	1.9
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	1200	PG_G		1.3	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (171/173)	171&173	340	PG_G		1.3	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	220	PG_G		1.2	1.2	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	60	PG_G		1.5	1.5	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	24	PG_G		0.24	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	5.5	PG_G	J	0.18	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	310	PG_G		1.3	1.3	19

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	62	PG_G		0.25	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	16	PG_G	J	0.19	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (180/193)	180&193	2000	PG_G		1.0	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	30	PG_G		1.0	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	4.9	PG_G	J	0.24	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	550	PG_G		0.78	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	1.6	PG_G	J	0.20	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	1.9	PG_G	U	1.3	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	0.94	PG_G	U	0.18	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	850	PG_G		0.21	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	5.1	PG_G	J	0.27	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	43	PG_G		0.43	0.94	1.9
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	190	PG_G		0.85	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	50	PG_G		0.93	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	0.96	PG_G	U	0.96	0.96	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	200	PG_G		0.54	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	73	PG_G		0.55	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	83	PG_G		0.33	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	8.1	PG_G	J	0.22	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (198/199)	198&199	250	PG_G		0.38	1.9	38
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	2.4	PG_G	J	0.36	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	26	PG_G		0.27	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	44	PG_G		0.31	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	180	PG_G		0.38	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	0.94	PG_G	U	0.27	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	7.5	PG_G	J	0.36	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	71	PG_G		0.65	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	11	PG_G	J	0.41	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	29	PG_G		0.38	0.94	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	23	PG_G		0.29	1.9	19
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	2100	PG_G		1.8	4.7	95
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	4300	PG_G		5.0	9.5	95
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	2800	PG_G		4.1	4.7	9.5
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	9300	PG_G		3.8	4.7	9.5
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (138/163/129)	138&163&129	11000	PG_G		1.5	14	280
VWW06-FS01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (153/168)	153&168	8800	PG_G		1.3	9.5	190
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	4.4	PG_G	J	0.45	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	1.5	PG_G	J	0.46	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	0.86	PG_G	J	0.46	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	24	PG_G		2.4	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	9.6	PG_G	U	2.3	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	20	PG_G		2.4	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	9.6	PG_G	U	2.2	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	60	PG_G		2.4	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	9.6	PG_G	U	2.5	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	9.6	PG_G	U	1.4	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	32	PG_G		2.4	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (13/12)	13&12	19	PG_G	U	2.4	19	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	9.6	PG_G	U	2.1	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	9.6	PG_G	U	2.0	9.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	17	PG_G	J	0.47	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	26	PG_G		0.38	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (30/18)	30&18	79	PG_G		0.32	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	29	PG_G		0.52	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (28/20)	28&20	460	PG_G		0.78	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (21/33)	21&33	60	PG_G		0.74	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	80	PG_G		0.81	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	0.96	PG_G	U	0.75	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	0.83	PG_G	J	0.29	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	29	PG_G		0.77	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (26/29)	26&29	65	PG_G		0.76	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	7.1	PG_G	J	0.28	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	250	PG_G		0.73	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	47	PG_G		0.27	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	3.7	PG_G	J	0.77	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	1.9	PG_G	U	0.81	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	28	PG_G		0.71	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	6.9	PG_G	J	0.68	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	0.96	PG_G	U	0.81	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	0.96	PG_G	U	0.73	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (40/71)	40&71	75	PG_G		0.68	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	3.0	PG_G	J	0.96	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	42	PG_G		0.77	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	0.96	PG_G	U	0.85	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (44/47/65)	44&47&65	850	PG_G		0.68	2.9	58
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	34	PG_G		0.87	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	9.9	PG_G	J	0.86	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	8.4	PG_G	J	0.73	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (69/49)	69&49	1000	PG_G		0.60	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (50/53)	50&53	96	PG_G		0.70	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	20	PG_G		0.66	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	6.0	PG_G	J	0.34	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	1.9	PG_G	U	1.6	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	130	PG_G		1.7	1.7	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	70	PG_G		1.6	1.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	1.5	PG_G	U	1.5	1.5	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (59/62/75)	59&62&75	85	PG_G		0.53	2.9	58
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	280	PG_G		1.6	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	3500	PG_G		1.5	3.8	77
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	92	PG_G		1.4	1.4	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	330	PG_G		0.50	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	33	PG_G		1.5	1.5	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	31	PG_G	J	1.4	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	45	PG_G		1.5	1.5	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	0.96	PG_G	U	0.55	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	34	PG_G	J	1.4	1.4	1.9
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	1.7	PG_G	U	1.7	1.7	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	38	PG_G		1.4	1.4	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	1.4	PG_G	U	1.4	1.4	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	3.4	PG_G		1.4	1.4	1.9

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	48	PG_G		2.7	2.7	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	2.2	PG_G	U	2.2	2.2	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	280	PG_G		2.6	2.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (117/116/85)	117&116&85	1100	PG_G		1.8	2.9	77
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	1300	PG_G		2.0	5.8	120
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (88/91)	88&91	290	PG_G		2.2	2.2	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	2.5	PG_G	U	2.5	2.5	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	1100	PG_G		2.4	2.4	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (93/100)	93&100	35	PG_G	J	2.2	2.2	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	4.2	PG_G	J	2.4	2.4	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	1700	PG_G		2.2	2.2	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	7.5	PG_G	J	0.35	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (98/102)	98&102	16	PG_G	J	2.3	2.3	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	39	PG_G		2.1	2.1	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	0.96	PG_G	U	0.38	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	2.1	PG_G	U	2.1	2.1	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	570	PG_G		1.4	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (107/124)	107&124	240	PG_G		1.7	5.8	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (110/115)	110&115	2600	PG_G		1.8	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	5.6	PG_G	J	1.7	1.7	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	2.2	PG_G	U	2.2	2.2	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	170	PG_G		1.7	1.7	1.9
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	42	PG_G		1.7	1.7	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	2.1	PG_G	J	1.7	1.7	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	1.8	PG_G	U	1.8	1.8	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	96	PG_G		1.7	1.7	1.9
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	23	PG_G		2.0	2.0	2.0
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	8.8	PG_G	J	1.8	1.8	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (128/166)	128&166	840	PG_G		0.72	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	340	PG_G		0.97	0.97	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	5.2	PG_G	J	0.92	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	210	PG_G		0.91	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	81	PG_G		0.89	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (134/143)	134&143	27	PG_G	J	0.98	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (151/135)	151&135	400	PG_G		0.83	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	85	PG_G		0.64	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	210	PG_G		0.65	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (139/140)	139&140	82	PG_G		0.79	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	540	PG_G		1.0	1.0	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	1.1	PG_G	U	1.1	1.1	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	76	PG_G		0.82	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	0.96	PG_G	U	0.63	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	860	PG_G		0.66	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (147/149)	147&149	560	PG_G		0.80	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	0.96	PG_G	U	0.80	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	0.96	PG_G	U	0.61	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	0.96	PG_G	U	0.59	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	51	PG_G		0.77	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	0.96	PG_G	U	0.77	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (156/157)	156&157	1300	PG_G		2.1	2.1	3.9
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	670	PG_G		0.64	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	1.9	PG_G	U	1.9	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	0.96	PG_G	U	0.81	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	0.96	PG_G	U	0.81	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	54	PG_G		1.9	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	130	PG_G		0.83	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	0.96	PG_G	U	0.69	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	420	PG_G		1.6	1.6	1.9
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	2.1	PG_G	U	2.1	2.1	2.1
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	760	PG_G		1.6	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (171/173)	171&173	200	PG_G		1.6	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	160	PG_G		1.5	1.5	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	77	PG_G		1.9	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	13	PG_G	J	0.38	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	6.3	PG_G	J	0.28	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	300	PG_G		1.6	1.6	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	71	PG_G		0.40	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	17	PG_G	J	0.30	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (180/193)	180&193	1400	PG_G		1.3	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	14	PG_G	J	1.3	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	3.1	PG_G	J	0.39	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	340	PG_G		0.98	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	0.96	PG_G	U	0.31	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	27	PG_G	J	1.7	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	0.96	PG_G	U	0.29	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	580	PG_G		0.33	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	2.4	PG_G	J	0.42	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	22	PG_G	J	0.51	0.96	1.9
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	130	PG_G		1.1	1.1	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	32	PG_G		1.2	1.2	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	1.2	PG_G	U	1.2	1.2	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	110	PG_G		0.63	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	43	PG_G		0.65	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	54	PG_G		0.67	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	5.6	PG_G	J	0.44	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (198/199)	198&199	160	PG_G		0.77	1.9	39
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	1.9	PG_G	U	0.72	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	17	PG_G	J	0.53	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	37	PG_G		0.61	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	100	PG_G		0.75	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	0.96	PG_G	U	0.54	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	2.5	PG_G	J	0.43	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	42	PG_G		1.3	1.3	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	6.6	PG_G	J	0.89	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	17	PG_G	J	0.85	0.96	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	13	PG_G	J	0.44	1.9	19
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	3100	PG_G		2.8	4.8	97
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	1700	PG_G		4.0	4.8	97
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (113/90/101)	113&90&101	5800	PG_G		5.7	14	290
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	3700	PG_G		5.7	9.7	97

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	2600	PG_G		5.0	5.0	9.7
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	8200	PG_G		4.5	4.8	9.7
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (138/163/129)	138&163&129	7800	PG_G		2.6	14	290
VWW06-FS02-0212	PCBCONG	T	02/01/2012 00:00	Congeners (153/168)	153&168	6400	PG_G		2.3	9.7	190
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	5.8	PG_G	U	5.8	5.8	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	6.0	PG_G	U	6.0	6.0	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	6.2	PG_G	U	6.2	6.2	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	46	PG_G	U	46	46	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	52	PG_G	U	52	52	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	53	PG_G	U	53	53	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	51	PG_G	U	51	51	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	280	PG_G	J	53	53	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	57	PG_G	U	57	57	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	34	PG_G	U	34	34	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	310	PG_G	J	55	55	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (13/12)	13&12	55	PG_G	U	55	55	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	46	PG_G	U	46	46	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	52	PG_G	U	52	52	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	76	PG_G	J	8.7	8.7	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	270	PG_G	J	7.1	7.1	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (30/18)	30&18	570	PG_G	J	6.0	6.0	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	110	PG_G	J	6.7	6.7	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (28/20)	28&20	2600	PG_G	J	12	12	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (21/33)	21&33	790	PG_G	J	11	11	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	430	PG_G	J	12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	11	PG_G	U	11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	5.5	PG_G	U	5.5	5.5	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	210	PG_G	J	12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (26/29)	26&29	440	PG_G	J	11	11	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	68	PG_G	J	5.3	5.3	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	1900	PG_G	J	11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	630	PG_G	J	5.1	5.1	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	12	PG_G	U	12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	12	PG_G	U	12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	240	PG_G	J	11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	270	PG_G	J	13	13	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	12	PG_G	U	12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	11	PG_G	U	11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (40/71)	40&71	1800	PG_G	J	11	11	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	56	PG_G	J	16	16	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	780	PG_G	J	13	13	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	140	PG_G	J	14	14	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (44/47/65)	44&47&65	11000	PG_G		11	11	5900
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	220	PG_G	J	14	14	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	120	PG_G	J	14	14	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	460	PG_G	J	12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (69/49)	69&49	10000	PG_G		9.9	9.9	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (50/53)	50&53	1000	PG_G	J	12	12	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	420	PG_G	J	11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	31000	PG_G		12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	4.7	PG_G	U	4.7	4.7	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	28	PG_G	U	28	28	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	2400	PG_G		29	29	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	1200	PG_G	J	27	27	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	27	PG_G	U	27	27	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (59/62/75)	59&62&75	630	PG_G	J	8.8	8.8	5900
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	1400	PG_G	J	28	28	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	26000	PG_G		27	27	7900
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	460	PG_G	J	25	25	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	3700	PG_G		8.3	8.3	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	11000	PG_G		28	28	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	310	PG_G	J	26	26	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	180	PG_G	J	25	25	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	320	PG_G	J	26	26	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	9.0	PG_G	U	9.0	9.0	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	380	PG_G		32	32	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	30	PG_G	U	30	30	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	460	PG_G	J	25	25	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	25	PG_G	U	25	25	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	30	PG_G	U	30	30	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	2100	PG_G		64	64	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	52	PG_G	U	52	52	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	6900	PG_G		61	61	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (117/116/85)	117&116&85	7700	PG_G		43	43	5900
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	33000	PG_G		47	47	12000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (88/91)	88&91	6000	PG_G		52	52	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	170	PG_G	J	58	58	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (113/90/101)	113&90&101	80000	PG_G		47	47	5900
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	14000	PG_G		55	55	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (93/100)	93&100	370	PG_G	J	51	51	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	88	PG_G	J	57	57	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	35000	PG_G		53	53	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	85	PG_G	J	5.3	5.3	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (98/102)	98&102	930	PG_G	J	54	54	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	33000	PG_G		47	47	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	430	PG_G	J	49	49	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	3.4	PG_G	U	3.4	3.4	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	16000	PG_G		45	45	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	50	PG_G	U	50	50	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	3300	PG_G		33	33	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (107/124)	107&124	2100	PG_G	J	41	41	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (110/115)	110&115	70000	PG_G		43	43	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	39	PG_G	U	39	39	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	51	PG_G	U	51	51	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	1300	PG_G		46	46	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	54000	PG_G		39	39	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	160	PG_G	J	39	39	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	39	PG_G	U	39	39	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	41	PG_G	U	41	41	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	530	PG_G		43	43	200

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	150	PG_G	J	56	56	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	41	PG_G	U	41	41	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (128/166)	128&166	8600	PG_G		12	12	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (138/163/129)	138&163&129	59000	PG_G		12	12	5900
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	3800	PG_G		16	16	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	270	PG_G	J	15	15	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	12000	PG_G		15	15	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	870	PG_G	J	15	15	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (134/143)	134&143	1800	PG_G	J	16	16	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (151/135)	151&135	12000	PG_G		14	14	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	4800	PG_G		11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	2400	PG_G		11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (139/140)	139&140	1100	PG_G	J	13	13	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	8800	PG_G		17	17	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	18	PG_G	U	18	18	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	1800	PG_G	J	14	14	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	11	PG_G	U	11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	6800	PG_G		11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (147/149)	147&149	35000	PG_G		13	13	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	13	PG_G	U	13	13	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	18	PG_G	J	10	10	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	24	PG_G	J	9.8	9.8	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (153/168)	153&168	46000	PG_G		11	11	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	600	PG_G	J	13	13	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	7.9	PG_G	U	7.9	7.9	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (156/157)	156&157	8000	PG_G		32	32	400
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	6600	PG_G		11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	68	PG_G	J	25	25	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	13	PG_G	U	13	13	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	14	PG_G	U	14	14	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	350	PG_G	J	25	25	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	3400	PG_G		14	14	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	12	PG_G	U	12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	2700	PG_G		24	24	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	34	PG_G	U	34	34	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	4900	PG_G		21	21	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (171/173)	171&173	1700	PG_G	J	22	22	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	820	PG_G	J	20	20	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	3800	PG_G		25	25	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	180	PG_G	J	8.3	8.3	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	340	PG_G	J	6.1	6.1	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	2900	PG_G		21	21	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	850	PG_G	J	8.6	8.6	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	1400	PG_G	J	6.5	6.5	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (180/193)	180&193	8500	PG_G		17	17	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	69	PG_G	J	17	17	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	37	PG_G	J	8.4	8.4	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	2400	PG_G		13	13	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	6.8	PG_G	U	6.8	6.8	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	22	PG_G	U	22	22	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	6.3	PG_G	U	6.3	6.3	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	4500	PG_G		7.2	7.2	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	14	PG_G	J	7.1	7.1	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	150	PG_G	J	8.8	8.8	200
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	840	PG_G	J	14	14	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	280	PG_G	J	15	15	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	16	PG_G	U	16	16	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	840	PG_G	J	8.8	8.8	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	310	PG_G	J	9.0	9.0	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	470	PG_G	J	10	10	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	48	PG_G	J	6.8	6.8	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Congeners (198/199)	198&199	1200	PG_G	J	12	12	4000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	68	PG_G	J	11	11	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	150	PG_G	J	8.2	8.2	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	320	PG_G	J	9.6	9.6	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	730	PG_G	J	12	12	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	8.3	PG_G	U	8.3	8.3	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	36	PG_G	J	5.9	5.9	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	450	PG_G	J	6.1	6.1	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	69	PG_G	J	4.2	4.2	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	160	PG_G	J	4.2	4.2	2000
VWW06-FS03-0212	PCBCONG	T	02/01/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	130	PG_G	J	3.2	3.2	2000
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	2.1	PG_G	J	0.30	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	1.2	PG_G	J	0.31	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	1.6	PG_G	J	0.31	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	4.9	PG_G	J	2.3	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	9.8	PG_G	U	1.9	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	7.4	PG_G	J	2.0	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	9.8	PG_G	U	1.9	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	32	PG_G		2.0	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	9.8	PG_G	U	2.1	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	9.8	PG_G	U	1.6	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	26	PG_G		2.0	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (13/12)	13&12	20	PG_G	U	2.0	20	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	9.8	PG_G	U	1.7	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	4.0	PG_G	J	1.8	9.8	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	8.9	PG_G	J	0.36	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	25	PG_G		0.30	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (30/18)	30&18	46	PG_G		0.25	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	8.0	PG_G	J	0.33	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (28/20)	28&20	180	PG_G		0.57	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (21/33)	21&33	88	PG_G		0.55	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	37	PG_G		0.60	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	0.98	PG_G	U	0.55	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	0.98	PG_G	U	0.23	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	14	PG_G	J	0.57	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (26/29)	26&29	30	PG_G	J	0.56	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	5.2	PG_G	J	0.22	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	130	PG_G		0.54	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	50	PG_G		0.21	0.98	20

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	3.2	PG_G	J	0.57	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	2.0	PG_G	U	0.60	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	13	PG_G	J	0.53	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	14	PG_G	J	0.56	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	0.98	PG_G	U	0.60	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	1.1	PG_G	J	0.54	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (40/71)	40&71	160	PG_G		0.29	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	5.4	PG_G	J	0.41	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	60	PG_G		0.33	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	11	PG_G	J	0.36	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (44/47/65)	44&47&65	560	PG_G		0.29	2.9	59
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	18	PG_G	J	0.37	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	7.7	PG_G	J	0.36	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	41	PG_G		0.31	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (69/49)	69&49	510	PG_G		0.25	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (50/53)	50&53	68	PG_G		0.30	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	31	PG_G		0.28	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	1500	PG_G		0.32	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	1.4	PG_G	J	0.19	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	10	PG_G	J	0.93	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	160	PG_G		0.95	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	2.9	PG_G	J	0.89	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	2.5	PG_G	J	0.88	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (59/62/75)	59&62&75	38	PG_G		0.23	2.9	59
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	82	PG_G		0.92	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	1300	PG_G		0.87	3.9	79
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	25	PG_G		0.80	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	200	PG_G		0.21	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	580	PG_G		0.91	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	17	PG_G	J	0.85	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	10	PG_G	J	0.82	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	16	PG_G	J	0.86	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	0.98	PG_G	U	0.23	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	24	PG_G		0.86	0.98	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	0.98	PG_G	U	0.97	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	15	PG_G	J	0.83	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	0.98	PG_G	U	0.80	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	2.0	PG_G		0.87	0.98	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	120	PG_G		1.7	1.7	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	140	PG_G		1.4	1.4	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	380	PG_G		1.6	1.6	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (117/116/85)	117&116&85	460	PG_G		1.1	2.9	59
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	1600	PG_G		1.2	5.9	120
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (88/91)	88&91	300	PG_G		1.4	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	14	PG_G	J	1.5	1.5	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (113/90/101)	113&90&101	3600	PG_G		1.2	2.9	59
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	660	PG_G		1.4	1.4	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (93/100)	93&100	17	PG_G	J	1.3	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	6.6	PG_G	J	1.5	1.5	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	1600	PG_G		1.4	1.4	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	4.1	PG_G	J	0.16	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (98/102)	98&102	60	PG_G		1.4	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	1500	PG_G		1.2	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	22	PG_G		1.3	1.3	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	0.98	PG_G	U	0.16	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	740	PG_G		1.0	1.0	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	2.0	PG_G	U	1.3	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	180	PG_G		0.85	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (107/124)	107&124	110	PG_G		1.1	5.9	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (110/115)	110&115	3200	PG_G		1.1	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	2.3	PG_G	J	1.0	1.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	1.3	PG_G	U	1.3	1.3	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	52	PG_G		1.1	1.1	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	11	PG_G	J	1.0	1.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	1.0	PG_G	U	1.0	1.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	27	PG_G		1.1	1.1	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	22	PG_G		1.1	1.1	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	5.5	PG_G		1.2	1.2	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	4.1	PG_G	J	1.1	1.1	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (128/166)	128&166	430	PG_G		0.31	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (138/163/129)	138&163&129	2800	PG_G		0.32	2.9	59
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	200	PG_G		0.43	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	11	PG_G	J	0.40	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	650	PG_G		0.40	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	46	PG_G		0.39	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (134/143)	134&143	88	PG_G		0.43	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (151/135)	151&135	610	PG_G		0.36	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	210	PG_G		0.28	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	110	PG_G		0.29	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (139/140)	139&140	54	PG_G		0.34	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	430	PG_G		0.45	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	0.98	PG_G	U	0.46	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	84	PG_G		0.36	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	0.98	PG_G	U	0.28	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	340	PG_G		0.29	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (147/149)	147&149	1700	PG_G		0.35	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	2.8	PG_G	J	0.35	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	2.9	PG_G	J	0.27	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	0.82	PG_G	J	0.26	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (153/168)	153&168	2200	PG_G		0.28	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	31	PG_G		0.34	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	0.98	PG_G	U	0.29	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (156/157)	156&157	380	PG_G		0.96	2.0	4.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	300	PG_G		0.28	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	5.4	PG_G	J	0.84	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	0.98	PG_G	U	0.35	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	0.98	PG_G	U	0.35	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	14	PG_G	J	0.85	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	190	PG_G		0.36	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	0.98	PG_G	U	0.30	0.98	20

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	130	PG_G		0.74	0.98	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	0.98	PG_G	U	0.96	0.98	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	340	PG_G		0.77	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (171/173)	171&173	110	PG_G		0.78	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	64	PG_G		0.73	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	290	PG_G		0.90	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	12	PG_G	J	0.23	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	21	PG_G		0.17	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	220	PG_G		0.76	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	63	PG_G		0.24	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	92	PG_G		0.18	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (180/193)	180&193	580	PG_G		0.62	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	8.3	PG_G	J	0.63	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	3.0	PG_G	J	0.23	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	160	PG_G		0.47	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	0.98	PG_G	U	0.19	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	23	PG_G		0.81	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	0.98	PG_G	U	0.18	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	330	PG_G		0.20	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	1.1	PG_G	J	0.21	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	9.8	PG_G		0.32	0.98	2.0
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	50	PG_G		0.51	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	15	PG_G	J	0.56	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	0.98	PG_G	U	0.58	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	66	PG_G		0.43	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	31	PG_G		0.44	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	41	PG_G		0.27	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	3.4	PG_G	J	0.18	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (198/199)	198&199	130	PG_G		0.31	2.0	40
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	8.3	PG_G	J	0.29	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	15	PG_G	J	0.21	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	29	PG_G		0.23	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	78	PG_G		0.30	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	0.98	PG_G	U	0.21	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	3.7	PG_G	J	0.31	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	40	PG_G		0.31	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	5.4	PG_G	J	0.19	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	17	PG_G	J	0.17	0.98	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	15	PG_G	J	0.22	2.0	20
VWW06-FS04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	2400	PG_G		2.6	4.9	9.9
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	2.7	PG_G	J	0.42	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	3.5	PG_G	J	0.41	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	1.1	PG_G	J	0.39	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	9.9	PG_G	J	2.0	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	9.8	PG_G	U	2.3	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	9.8	PG_G	U	2.3	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	9.8	PG_G	U	2.2	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	37	PG_G		2.3	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	9.8	PG_G	U	2.5	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	9.8	PG_G	U	1.4	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	71	PG_G		2.4	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (13/12)	13&12	20	PG_G	U	2.4	20	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	9.8	PG_G	U	2.0	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	10	PG_G	J	2.1	9.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	10	PG_G	J	0.46	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	28	PG_G		0.37	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (30/18)	30&18	62	PG_G		0.32	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	11	PG_G	J	0.46	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (28/20)	28&20	320	PG_G		0.63	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (21/33)	21&33	93	PG_G		0.60	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	58	PG_G		0.66	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	3.3	PG_G	J	0.61	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	0.98	PG_G	U	0.29	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	23	PG_G		0.63	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (26/29)	26&29	48	PG_G		0.61	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	6.7	PG_G	J	0.28	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	220	PG_G		0.59	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	71	PG_G		0.27	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	0.98	PG_G	U	0.63	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	2.0	PG_G	U	0.66	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	20	PG_G		0.58	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	33	PG_G		0.57	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	0.98	PG_G	U	0.66	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	0.98	PG_G	U	0.59	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (40/71)	40&71	200	PG_G		0.51	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	0.98	PG_G	U	0.72	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	78	PG_G		0.57	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	10	PG_G	J	0.64	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (44/47/65)	44&47&65	940	PG_G		0.51	2.9	59
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	26	PG_G		0.65	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	10	PG_G	J	0.64	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	43	PG_G		0.55	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (69/49)	69&49	870	PG_G		0.45	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (50/53)	50&53	110	PG_G		0.52	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	40	PG_G		0.49	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	2.0	PG_G	J	0.22	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	2.0	PG_G	U	1.2	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	280	PG_G		1.2	1.2	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	78	PG_G		1.2	1.2	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	1.1	PG_G	U	1.1	1.1	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (59/62/75)	59&62&75	63	PG_G		0.40	2.9	59
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	160	PG_G		1.2	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	2600	PG_G		1.1	3.9	79
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	53	PG_G		1.0	1.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	350	PG_G		0.37	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	1200	PG_G		1.2	1.2	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	29	PG_G		1.1	1.1	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	18	PG_G	J	1.1	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	29	PG_G		1.1	1.1	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	0.98	PG_G	U	0.41	0.98	20

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	52	PG_G		1.1	1.1	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	1.3	PG_G	U	1.3	1.3	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	71	PG_G		1.1	1.1	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	1.0	PG_G	U	1.0	1.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	1.1	PG_G	U	1.1	1.1	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	160	PG_G		2.0	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	1.7	PG_G	U	1.7	1.7	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	530	PG_G		1.9	1.9	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (117/116/85)	117&116&85	800	PG_G		1.4	2.9	59
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	2500	PG_G		1.5	5.9	120
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (88/91)	88&91	470	PG_G		1.7	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	14	PG_G	J	1.8	1.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	980	PG_G		1.7	1.7	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (93/100)	93&100	29	PG_G		1.6	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	8.8	PG_G	J	1.8	1.8	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	5.8	PG_G	J	0.18	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (98/102)	98&102	77	PG_G		1.7	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	31	PG_G		1.5	1.5	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	0.98	PG_G	U	0.21	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	1600	PG_G		1.2	1.2	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	2.0	PG_G	U	1.6	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	380	PG_G		1.0	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (107/124)	107&124	200	PG_G		1.3	5.9	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	1.2	PG_G	U	1.2	1.2	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	1.6	PG_G	U	1.6	1.6	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	120	PG_G		1.3	1.3	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	22	PG_G		1.2	1.2	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	1.4	PG_G	J	1.2	1.2	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	61	PG_G		1.3	1.3	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	64	PG_G		1.2	1.2	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	13	PG_G	J	1.4	1.4	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	7.6	PG_G	J	1.3	1.3	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (128/166)	128&166	750	PG_G		0.44	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (138/163/129)	138&163&129	5200	PG_G		0.45	2.9	59
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	320	PG_G		0.60	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	19	PG_G	J	0.56	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	920	PG_G		0.55	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	74	PG_G		0.54	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (134/143)	134&143	130	PG_G		0.60	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (151/135)	151&135	830	PG_G		0.51	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	290	PG_G		0.39	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	220	PG_G		0.40	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (139/140)	139&140	95	PG_G		0.48	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	670	PG_G		0.64	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	0.98	PG_G	U	0.65	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	120	PG_G		0.50	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	1.1	PG_G	J	0.38	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	650	PG_G		0.40	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (147/149)	147&149	2700	PG_G		0.49	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	3.6	PG_G	J	0.49	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	3.7	PG_G	J	0.37	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	1.9	PG_G	J	0.36	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	56	PG_G		0.47	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	0.98	PG_G	U	0.41	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (156/157)	156&157	830	PG_G		1.4	2.0	3.9
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	590	PG_G		0.39	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	6.3	PG_G	J	1.2	1.2	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	0.98	PG_G	U	0.49	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	0.98	PG_G	U	0.49	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	35	PG_G		1.2	1.2	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	310	PG_G		0.51	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	1.2	PG_G	J	0.42	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	280	PG_G		0.97	0.98	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	1.3	PG_G	U	1.3	1.3	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	510	PG_G		0.94	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (171/173)	171&173	180	PG_G		0.97	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	100	PG_G		0.90	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	360	PG_G		1.1	1.1	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	15	PG_G	J	0.29	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	25	PG_G		0.21	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	300	PG_G		0.94	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	82	PG_G		0.30	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	100	PG_G		0.23	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (180/193)	180&193	960	PG_G		0.76	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	13	PG_G	J	0.77	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	5.2	PG_G	J	0.29	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	230	PG_G		0.58	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	1.2	PG_G	J	0.24	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	31	PG_G	J	0.99	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	0.98	PG_G	U	0.22	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	540	PG_G		0.25	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	3.1	PG_G	J	0.27	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	19	PG_G		0.29	0.98	2.0
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	79	PG_G		0.63	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	24	PG_G		0.69	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	0.98	PG_G	U	0.72	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	79	PG_G		0.44	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	31	PG_G		0.46	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	48	PG_G		0.27	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	5.6	PG_G	J	0.18	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (198/199)	198&199	160	PG_G		0.31	2.0	39
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	7.2	PG_G	J	0.29	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	17	PG_G	J	0.22	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	36	PG_G		0.25	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	75	PG_G		0.31	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	0.98	PG_G	U	0.22	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	2.8	PG_G	J	0.30	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	33	PG_G		0.95	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	5.8	PG_G	J	0.64	0.98	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	18	PG_G	J	0.62	0.98	20

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	13	PG_G	J	0.21	2.0	20
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	2400	PG_G		1.5	4.9	98
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (113/90/101)	113&90&101	5900	PG_G		4.0	15	300
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	2500	PG_G		4.4	4.9	98
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	3100	PG_G		3.9	9.8	98
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (110/115)	110&115	6100	PG_G		3.6	9.8	200
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	5600	PG_G		3.1	4.9	9.8
VWW06-CRB01-0112	PCBCONG	T	01/31/2012 00:00	Congeners (153/168)	153&168	4100	PG_G		1.3	9.8	200
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	3.1	PG_G	J	0.19	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	4.1	PG_G	J	0.18	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	1.2	PG_G	J	0.17	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	8.7	PG_G	J	0.92	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	9.9	PG_G	U	0.89	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	11	PG_G	J	0.90	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	9.9	PG_G	U	0.85	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	39	PG_G		0.90	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	9.9	PG_G	U	0.96	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	9.9	PG_G	U	0.57	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	72	PG_G		0.93	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (13/12)	13&12	20	PG_G	U	0.93	20	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	9.9	PG_G	U	0.78	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	9.1	PG_G	J	0.76	9.9	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	11	PG_G	J	0.21	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	32	PG_G		0.17	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (30/18)	30&18	64	PG_G		0.14	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	11	PG_G	J	0.24	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (28/20)	28&20	350	PG_G		0.41	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (21/33)	21&33	100	PG_G		0.39	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	63	PG_G		0.42	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	0.99	PG_G	U	0.39	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	0.99	PG_G	U	0.13	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	26	PG_G		0.40	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (26/29)	26&29	54	PG_G		0.39	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	7.5	PG_G	J	0.13	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	250	PG_G		0.38	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	76	PG_G		0.12	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	3.6	PG_G	J	0.40	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	2.0	PG_G	U	0.42	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	26	PG_G		0.37	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	36	PG_G		0.34	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	0.99	PG_G	U	0.42	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	1.6	PG_G	J	0.38	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (40/71)	40&71	210	PG_G		0.21	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	0.99	PG_G	U	0.30	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	79	PG_G		0.24	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	13	PG_G	J	0.27	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (44/47/65)	44&47&65	980	PG_G		0.22	3.0	60
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	22	PG_G		0.27	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	10	PG_G	J	0.27	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	44	PG_G		0.23	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (69/49)	69&49	910	PG_G		0.19	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (50/53)	50&53	110	PG_G		0.22	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	41	PG_G		0.21	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	2.2	PG_G	J	0.085	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	2.0	PG_G	U	0.63	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	300	PG_G		0.64	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	0.99	PG_G	U	0.60	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	0.99	PG_G	U	0.60	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (59/62/75)	59&62&75	64	PG_G		0.17	3.0	60
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	170	PG_G		0.62	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	2800	PG_G		0.59	4.0	80
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	56	PG_G		0.54	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	360	PG_G		0.16	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	1300	PG_G		0.61	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	32	PG_G		0.58	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	19	PG_G	J	0.55	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	24	PG_G		0.58	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	0.99	PG_G	U	0.17	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	53	PG_G		0.56	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	0.99	PG_G	U	0.65	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	71	PG_G		0.56	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	0.99	PG_G	U	0.54	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	0.99	PG_G	U	0.55	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	170	PG_G		1.3	1.3	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	1.1	PG_G	U	1.1	1.1	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	560	PG_G		1.3	1.3	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (117/116/85)	117&116&85	860	PG_G		0.90	3.0	60
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	2700	PG_G		0.97	5.9	120
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (88/91)	88&91	510	PG_G		1.1	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	15	PG_G	J	1.2	1.2	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	1000	PG_G		1.1	1.1	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (93/100)	93&100	30	PG_G	J	1.1	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	9.1	PG_G	J	1.2	1.2	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	5.7	PG_G	J	0.086	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (98/102)	98&102	82	PG_G		1.1	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	33	PG_G		1.0	1.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	0.57	PG_G	J	0.096	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	1800	PG_G		0.79	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	2.0	PG_G	U	1.0	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	400	PG_G		0.68	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (107/124)	107&124	220	PG_G		0.85	5.9	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	5.4	PG_G	J	0.82	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	1.1	PG_G	U	1.1	1.1	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	120	PG_G		0.83	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	24	PG_G		0.82	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	1.4	PG_G	J	0.81	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	58	PG_G		0.86	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	71	PG_G		0.81	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	8.5	PG_G	J	0.88	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	8.0	PG_G	J	0.86	0.99	20

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (128/166)	128&166	840	PG_G		0.37	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (138/163/129)	138&163&129	5600	PG_G		0.38	3.0	60
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	360	PG_G		0.50	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	20	PG_G	J	0.48	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	1000	PG_G		0.47	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	83	PG_G		0.46	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (134/143)	134&143	120	PG_G		0.51	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (151/135)	151&135	900	PG_G		0.43	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	310	PG_G		0.33	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	240	PG_G		0.34	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (139/140)	139&140	100	PG_G		0.41	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	690	PG_G		0.54	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	0.99	PG_G	U	0.55	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	130	PG_G		0.42	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	0.99	PG_G	U	0.32	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	710	PG_G		0.34	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (147/149)	147&149	2900	PG_G		0.41	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	3.6	PG_G	J	0.41	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	4.0	PG_G	J	0.32	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	2.1	PG_G	J	0.30	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	58	PG_G		0.40	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	1.0	PG_G	J	0.35	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (156/157)	156&157	920	PG_G		0.84	2.0	4.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	680	PG_G		0.33	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	8.5	PG_G	J	0.72	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	0.99	PG_G	U	0.42	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	0.99	PG_G	U	0.42	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	40	PG_G		0.73	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,6-Hexachlorobiphenyl (164)	74472-45-0	340	PG_G		0.43	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	0.74	PG_G	J	0.36	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	300	PG_G		0.63	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	1.3	PG_G	J	0.77	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	590	PG_G		0.47	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (171/173)	171&173	210	PG_G		0.49	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	120	PG_G		0.45	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	410	PG_G		0.55	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	17	PG_G	J	0.13	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	28	PG_G		0.096	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	340	PG_G		0.47	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	94	PG_G		0.14	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	110	PG_G		0.10	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (180/193)	180&193	1100	PG_G		0.38	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	15	PG_G	J	0.39	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	5.1	PG_G	J	0.13	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	260	PG_G		0.29	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	0.94	PG_G	J	0.11	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	48	PG_G	J	0.50	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	0.99	PG_G	U	0.099	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	620	PG_G		0.11	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	3.0	PG_G	J	0.12	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	20	PG_G		0.23	0.99	2.0
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	82	PG_G		0.32	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	25	PG_G		0.35	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	0.99	PG_G	U	0.36	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	86	PG_G		0.26	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	34	PG_G		0.27	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	56	PG_G		0.15	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	4.8	PG_G	J	0.096	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (198/199)	198&199	180	PG_G		0.17	2.0	40
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	7.2	PG_G	J	0.16	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	20	PG_G	J	0.11	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	38	PG_G		0.13	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	83	PG_G		0.16	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	0.99	PG_G	U	0.12	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	3.7	PG_G	J	0.19	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	39	PG_G		0.41	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	7.0	PG_G	J	0.27	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	19	PG_G	J	0.25	0.99	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	15	PG_G	J	0.11	2.0	20
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	2700	PG_G		2.0	5.0	100
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (113/90/101)	113&90&101	6600	PG_G		3.8	15	300
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	2900	PG_G		4.2	5.0	100
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	3500	PG_G		3.8	9.9	100
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (110/115)	110&115	6700	PG_G		3.5	9.9	200
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	6400	PG_G		3.0	5.0	10
VWW06-CRB01P-0112	PCBCONG	T	01/31/2012 00:00	Congeners (153/168)	153&168	4600	PG_G		1.4	9.9	200
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	1.9	PG_G	J	0.24	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	2.1	PG_G	J	0.23	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	1.5	PG_G	J	0.21	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	4.3	PG_G	J	1.4	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	9.5	PG_G	U	1.1	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	11	PG_G	J	1.1	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	9.5	PG_G	U	1.0	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	37	PG_G		1.1	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	9.5	PG_G	U	1.2	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	9.5	PG_G	U	0.86	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	70	PG_G		1.1	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (13/12)	13&12	19	PG_G	U	1.1	19	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	9.5	PG_G	U	0.96	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	18	PG_G	J	0.95	9.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	4.2	PG_G	J	0.28	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	14	PG_G	J	0.23	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (30/18)	30&18	23	PG_G	J	0.19	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	2.3	PG_G	J	0.31	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (28/20)	28&20	500	PG_G		0.41	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (21/33)	21&33	57	PG_G		0.39	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	130	PG_G		0.42	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	0.95	PG_G	U	0.39	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	0.95	PG_G	U	0.18	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	18	PG_G	J	0.40	0.95	19

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (26/29)	26&29	26	PG_G	J	0.39	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	3.9	PG_G	J	0.17	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	170	PG_G		0.38	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	45	PG_G		0.16	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	3.2	PG_G	J	0.40	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	3.4	PG_G	J	0.42	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	7.3	PG_G	J	0.37	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	34	PG_G		0.35	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	0.95	PG_G	U	0.42	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	3.5	PG_G	J	0.38	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (40/71)	40&71	170	PG_G		0.41	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	0.95	PG_G	U	0.57	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	44	PG_G		0.46	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	5.9	PG_G	J	0.51	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (44/47/65)	44&47&65	700	PG_G		0.41	2.8	57
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	3.2	PG_G	J	0.52	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	3.2	PG_G	J	0.51	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	21	PG_G		0.44	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (69/49)	69&49	290	PG_G		0.36	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (50/53)	50&53	43	PG_G		0.42	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	11	PG_G	J	0.39	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	780	PG_G		0.44	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	0.95	PG_G	U	0.16	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	1.9	PG_G	U	0.75	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	140	PG_G		0.77	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	2.4	PG_G	J	0.72	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	3.1	PG_G	J	0.72	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (59/62/75)	59&62&75	61	PG_G		0.32	2.8	57
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	210	PG_G		0.75	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	2000	PG_G		0.71	3.8	76
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	93	PG_G		0.65	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	150	PG_G		0.30	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	1100	PG_G		0.74	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	21	PG_G		0.69	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	27	PG_G		0.67	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	21	PG_G		0.70	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	0.95	PG_G	U	0.33	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	56	PG_G		0.68	0.95	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	0.95	PG_G	U	0.78	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	19	PG_G	J	0.67	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	0.95	PG_G	U	0.65	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	2.8	PG_G		0.64	0.95	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	100	PG_G		1.7	1.7	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	1.3	PG_G	U	1.3	1.3	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	110	PG_G		1.6	1.6	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (117/116/85)	117&116&85	780	PG_G		1.1	2.8	57
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	1200	PG_G		1.2	5.7	110
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (88/91)	88&91	65	PG_G		1.3	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	4.1	PG_G	J	1.5	1.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (113/90/101)	113&90&101	2400	PG_G		1.2	2.8	57
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	170	PG_G		1.4	1.4	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (93/100)	93&100	26	PG_G	J	1.3	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	6.0	PG_G	J	1.5	1.5	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	400	PG_G		1.4	1.4	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	0.95	PG_G	U	0.14	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (98/102)	98&102	31	PG_G	J	1.4	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	6.2	PG_G	J	1.2	1.2	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	0.95	PG_G	U	0.16	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	1800	PG_G		0.99	0.99	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	1.9	PG_G	U	1.3	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	440	PG_G		0.84	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (107/124)	107&124	130	PG_G		1.1	5.7	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (110/115)	110&115	3600	PG_G		1.1	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	6.7	PG_G	J	1.0	1.0	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	1.3	PG_G	U	1.3	1.3	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	150	PG_G		1.0	1.0	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	27	PG_G		1.0	1.0	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	1.0	PG_G	U	1.0	1.0	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	48	PG_G		1.1	1.1	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	81	PG_G		0.98	0.98	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	9.1	PG_G	J	1.1	1.1	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	5.3	PG_G	J	1.1	1.1	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (128/166)	128&166	530	PG_G		0.33	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (138/163/129)	138&163&129	4300	PG_G		0.33	2.8	57
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	160	PG_G		0.44	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	11	PG_G	J	0.42	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	140	PG_G		0.41	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	46	PG_G		0.40	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (134/143)	134&143	35	PG_G	J	0.44	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (151/135)	151&135	130	PG_G		0.38	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	12	PG_G	J	0.29	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	190	PG_G		0.30	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (139/140)	139&140	84	PG_G		0.36	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	190	PG_G		0.47	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	0.95	PG_G	U	0.48	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	18	PG_G	J	0.37	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	0.95	PG_G	U	0.28	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	690	PG_G		0.30	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (147/149)	147&149	740	PG_G		0.36	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	1.1	PG_G	J	0.36	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	0.95	PG_G	U	0.28	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	0.72	PG_G	J	0.27	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	59	PG_G		0.35	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	0.95	PG_G	U	0.29	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (156/157)	156&157	870	PG_G		0.87	1.9	3.8
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	600	PG_G		0.29	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	0.96	PG_G	J	0.74	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	0.95	PG_G	U	0.36	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	0.95	PG_G	U	0.37	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	33	PG_G		0.74	0.95	19

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	130	PG_G		0.37	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	1.0	PG_G	J	0.31	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	290	PG_G		0.65	0.95	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	0.95	PG_G	U	0.82	0.95	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	190	PG_G		0.47	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (171/173)	171&173	100	PG_G		0.48	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	71	PG_G		0.45	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	61	PG_G		0.55	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	4.4	PG_G	J	0.18	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	3.0	PG_G	J	0.13	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	110	PG_G		0.46	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	40	PG_G		0.19	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	7.8	PG_G	J	0.14	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (180/193)	180&193	660	PG_G		0.38	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	13	PG_G	J	0.38	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	4.1	PG_G	J	0.18	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	200	PG_G		0.29	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	0.57	PG_G	J	0.15	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	1.9	PG_G	U	0.49	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	0.95	PG_G	U	0.14	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	450	PG_G		0.16	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	1.5	PG_G	J	0.17	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	13	PG_G		0.22	0.95	1.9
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	43	PG_G		0.31	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	14	PG_G	J	0.34	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	0.95	PG_G	U	0.35	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	28	PG_G		0.31	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	9.8	PG_G	J	0.32	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	32	PG_G		0.17	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	2.6	PG_G	J	0.12	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (198/199)	198&199	97	PG_G		0.20	1.9	38
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	1.9	PG_G	U	0.19	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	8.3	PG_G	J	0.14	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	20	PG_G		0.15	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	34	PG_G		0.20	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	0.95	PG_G	U	0.14	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	0.95	PG_G	U	0.22	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	9.3	PG_G	J	0.54	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	2.8	PG_G	J	0.34	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	8.8	PG_G	J	0.31	0.95	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	6.1	PG_G	J	0.15	1.9	19
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	3700	PG_G		3.9	9.5	95
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	6400	PG_G		3.0	4.8	9.5
VWW06-CRB02-0112	PCBCONG	T	01/31/2012 00:00	Congeners (153/168)	153&168	4500	PG_G		1.5	9.5	190
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	2.0	PG_G	J	0.32	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	2.5	PG_G	J	0.31	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	2.0	PG_G	J	0.29	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	10	PG_G	U	1.3	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	10	PG_G	U	1.8	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	7.4	PG_G	J	1.8	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	10	PG_G	U	1.7	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	31	PG_G		1.8	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	10	PG_G	U	1.9	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	10	PG_G	U	0.90	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	91	PG_G		1.9	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (13/12)	13&12	20	PG_G	U	1.9	20	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	10	PG_G	U	1.6	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	14	PG_G	J	1.6	10	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	1.4	PG_G	J	0.33	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	6.7	PG_G	J	0.27	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (30/18)	30&18	16	PG_G	J	0.23	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	1.6	PG_G	J	0.34	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (28/20)	28&20	370	PG_G		0.59	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (21/33)	21&33	39	PG_G	J	0.56	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	56	PG_G		0.61	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	1.0	PG_G	U	0.56	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	1.0	PG_G	U	0.21	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	17	PG_G	J	0.58	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (26/29)	26&29	40	PG_G		0.57	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	2.4	PG_G	J	0.20	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	200	PG_G		0.55	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	44	PG_G		0.19	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	1.9	PG_G	J	0.58	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	2.7	PG_G	J	0.61	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	11	PG_G	J	0.54	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	45	PG_G		0.53	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	1.0	PG_G	U	0.61	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	1.6	PG_G	J	0.55	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (40/71)	40&71	97	PG_G		0.34	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	1.0	PG_G	U	0.48	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	47	PG_G		0.38	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	3.2	PG_G	J	0.42	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (44/47/65)	44&47&65	480	PG_G		0.34	3.0	60
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	2.7	PG_G	J	0.43	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	1.0	PG_G	U	0.42	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	9.9	PG_G	J	0.36	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (69/49)	69&49	390	PG_G		0.30	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (50/53)	50&53	15	PG_G	J	0.34	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	5.7	PG_G	J	0.33	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	1300	PG_G		0.37	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	1.0	PG_G	U	0.21	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	2.0	PG_G	U	0.79	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	210	PG_G		0.82	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	2.9	PG_G	J	0.76	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	3.1	PG_G	J	0.75	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (59/62/75)	59&62&75	42	PG_G	J	0.26	3.0	60
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	200	PG_G		0.79	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	2100	PG_G		0.74	4.0	80
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	61	PG_G		0.69	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	280	PG_G		0.25	1.0	20

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	1200	PG_G		0.78	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	22	PG_G		0.73	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	18	PG_G	J	0.70	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	25	PG_G		0.73	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	1.0	PG_G	U	0.27	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	72	PG_G		0.71	1.0	2.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	1.0	PG_G	U	0.83	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	16	PG_G	J	0.71	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	1.0	PG_G	U	0.69	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	4.4	PG_G		0.68	1.0	2.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	74	PG_G		1.6	1.6	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	1.3	PG_G	U	1.3	1.3	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	47	PG_G		1.5	1.5	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (117/116/85)	117&116&85	690	PG_G		1.1	3.0	60
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	920	PG_G		1.2	6.0	120
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (88/91)	88&91	160	PG_G		1.3	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	2.9	PG_G	J	1.4	1.4	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (113/90/101)	113&90&101	3800	PG_G		1.2	3.0	60
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	290	PG_G		1.4	1.4	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (93/100)	93&100	19	PG_G	J	1.3	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	2.6	PG_G	J	1.4	1.4	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	350	PG_G		1.3	1.3	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	1.0	PG_G	U	0.15	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (98/102)	98&102	16	PG_G	J	1.3	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	7.0	PG_G	J	1.2	1.2	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	1.0	PG_G	U	0.18	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	2.0	PG_G	U	1.2	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	410	PG_G		0.81	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (107/124)	107&124	160	PG_G		1.0	6.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (110/115)	110&115	3500	PG_G		1.1	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	6.1	PG_G	J	0.97	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	1.3	PG_G	U	1.3	1.3	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	120	PG_G		1.0	1.0	2.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	29	PG_G		0.97	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	1.0	PG_G	U	0.97	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	48	PG_G		1.0	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	63	PG_G		0.96	1.0	2.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	17	PG_G		1.1	1.1	2.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	6.7	PG_G	J	1.0	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (128/166)	128&166	640	PG_G		0.40	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (138/163/129)	138&163&129	5200	PG_G		0.41	3.0	60
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	230	PG_G		0.54	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	6.4	PG_G	J	0.51	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	170	PG_G		0.51	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	73	PG_G		0.50	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (134/143)	134&143	23	PG_G	J	0.55	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (151/135)	151&135	180	PG_G		0.46	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	9.9	PG_G	J	0.36	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	150	PG_G		0.36	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (139/140)	139&140	72	PG_G		0.44	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	280	PG_G		0.58	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	1.0	PG_G	U	0.59	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	31	PG_G		0.46	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	1.0	PG_G	U	0.35	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	730	PG_G		0.36	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (147/149)	147&149	1400	PG_G		0.44	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	1.4	PG_G	J	0.45	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	1.1	PG_G	J	0.34	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	1.0	PG_G	U	0.33	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	55	PG_G		0.43	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	1.6	PG_G	J	0.35	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (156/157)	156&157	920	PG_G		1.1	2.0	4.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	590	PG_G		0.36	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	1.9	PG_G	J	0.93	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	1.0	PG_G	U	0.45	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	1.0	PG_G	U	0.45	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	33	PG_G		0.94	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	180	PG_G		0.46	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	1.4	PG_G	J	0.39	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	280	PG_G		0.82	1.0	2.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	1.0	PG_G	U	1.0	1.0	2.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	380	PG_G		0.78	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (171/173)	171&173	140	PG_G		0.80	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	100	PG_G		0.75	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	120	PG_G		0.92	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	11	PG_G	J	0.20	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	8.0	PG_G	J	0.15	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	240	PG_G		0.78	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	80	PG_G		0.21	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	17	PG_G	J	0.16	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (180/193)	180&193	980	PG_G		0.63	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	13	PG_G	J	0.64	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	3.3	PG_G	J	0.20	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	240	PG_G		0.48	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	0.90	PG_G	J	0.17	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	2.0	PG_G	U	0.83	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	1.0	PG_G	U	0.15	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	690	PG_G		0.18	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	2.7	PG_G	J	0.19	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	20	PG_G		0.28	1.0	2.0
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	70	PG_G		0.52	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	22	PG_G		0.57	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	1.0	PG_G	U	0.60	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	96	PG_G		0.39	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	28	PG_G		0.40	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	61	PG_G		0.29	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	6.6	PG_G	J	0.19	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (198/199)	198&199	210	PG_G		0.33	2.0	40
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	2.0	PG_G	U	0.31	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	19	PG_G	J	0.23	1.0	20

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	45	PG_G		0.26	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	65	PG_G		0.33	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	1.0	PG_G	U	0.23	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	1.0	PG_G	J	0.27	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	27	PG_G		0.35	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	6.8	PG_G	J	0.23	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	19	PG_G	J	0.22	1.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	16	PG_G	J	0.16	2.0	20
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	2800	PG_G		4.9	10	100
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	2000	PG_G		4.3	5.0	10
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	6100	PG_G		3.8	5.0	10
VWW06-CRB03-0112	PCBCONG	T	01/31/2012 00:00	Congeners (153/168)	153&168	4500	PG_G		2.0	10	100
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2-Chlorobiphenyl (1)	2051-60-7	1.9	PG_G	U	0.31	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3-Chlorobiphenyl (2)	2051-61-8	1.4	PG_G	J	0.29	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	4-Chlorobiphenyl (3)	2051-62-9	1.0	PG_G	J	0.26	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2'-Dichlorobiphenyl (4)	13029-08-8	9.7	PG_G	U	1.8	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3-Dichlorobiphenyl (5)	16605-91-7	9.7	PG_G	U	1.3	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3'-Dichlorobiphenyl (6)	25569-80-6	9.7	PG_G	U	1.3	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,4-Dichlorobiphenyl (7)	33284-50-3	9.7	PG_G	U	1.3	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,4'-Dichlorobiphenyl (8)	34883-43-7	15	PG_G	J	1.3	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,5-Dichlorobiphenyl (9)	34883-39-1	9.7	PG_G	U	1.4	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,6-Dichlorobiphenyl (10)	33146-45-1	9.7	PG_G	U	1.2	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3'-Dichlorobiphenyl (11)	2050-67-1	47	PG_G		1.4	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (13/12)	13&12	19	PG_G	U	1.4	19	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,5-Dichlorobiphenyl (14)	34883-41-5	9.7	PG_G	U	1.2	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	4,4'-Dichlorobiphenyl (15)	2050-68-2	8.5	PG_G	J	1.2	9.7	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3-Trichlorobiphenyl (16)	38444-78-9	0.97	PG_G	U	0.37	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4-Trichlorobiphenyl (17)	37680-66-3	2.4	PG_G	J	0.30	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (30/18)	30&18	6.3	PG_G	J	0.25	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',6-Trichlorobiphenyl (19)	38444-73-4	0.97	PG_G	U	0.37	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (28/20)	28&20	160	PG_G		0.48	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (21/33)	21&33	15	PG_G	J	0.45	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4'-Trichlorobiphenyl (22)	38444-85-8	27	PG_G		0.50	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,5-Trichlorobiphenyl (23)	55720-44-0	0.97	PG_G	U	0.46	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,6-Trichlorobiphenyl (24)	55702-45-9	0.97	PG_G	U	0.23	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4-Trichlorobiphenyl (25)	55712-37-3	8.3	PG_G	J	0.47	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (26/29)	26&29	20	PG_G	J	0.46	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',6-Trichlorobiphenyl (27)	38444-76-7	1.0	PG_G	J	0.22	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,4',5-Trichlorobiphenyl (31)	16606-02-3	90	PG_G		0.45	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,4',6-Trichlorobiphenyl (32)	38444-77-8	20	PG_G		0.21	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',5'-Trichlorobiphenyl (34)	37680-68-5	0.97	PG_G	U	0.47	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4-Trichlorobiphenyl (35)	37680-69-6	1.9	PG_G	U	0.50	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',5-Trichlorobiphenyl (36)	38444-87-0	5.9	PG_G	J	0.44	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,4,4'-Trichlorobiphenyl (37)	38444-90-5	21	PG_G		0.43	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,4,5-Trichlorobiphenyl (38)	53555-66-1	0.97	PG_G	U	0.50	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,4',5-Trichlorobiphenyl (39)	38444-88-1	0.97	PG_G	U	0.45	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (40/71)	40&71	48	PG_G		0.28	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4-Tetrachlorobiphenyl (41)	52663-59-9	0.97	PG_G	U	0.39	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4'-Tetrachlorobiphenyl (42)	36559-22-5	21	PG_G		0.31	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5-Tetrachlorobiphenyl (43)	70362-46-8	0.69	PG_G	J	0.35	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (44/47/65)	44&47&65	240	PG_G		0.28	2.9	58
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6-Tetrachlorobiphenyl (45)	70362-45-7	1.2	PG_G	J	0.35	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6'-Tetrachlorobiphenyl (46)	41464-47-5	0.97	PG_G	U	0.35	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5-Tetrachlorobiphenyl (48)	70362-47-9	0.97	PG_G	U	0.30	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (69/49)	69&49	190	PG_G		0.24	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (50/53)	50&53	6.5	PG_G	J	0.28	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6'-Tetrachlorobiphenyl (51)	68194-04-7	2.7	PG_G	J	0.27	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',5,5'-Tetrachlorobiphenyl (52)	35693-99-3	450	PG_G		0.30	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',6,6'-Tetrachlorobiphenyl (54)	15968-05-5	0.97	PG_G	U	0.17	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4-Tetrachlorobiphenyl (55)	74338-24-2	1.9	PG_G	U	0.71	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4'-Tetrachlorobiphenyl (56)	41464-43-1	100	PG_G		0.73	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5-Tetrachlorobiphenyl (57)	70424-67-8	1.2	PG_G	J	0.68	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5'-Tetrachlorobiphenyl (58)	41464-49-7	1.1	PG_G	J	0.67	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (59/62/75)	59&62&75	19	PG_G	J	0.22	2.9	58
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4'-Tetrachlorobiphenyl (60)	33025-41-1	80	PG_G		0.70	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (61/70/74/76)	61&70&74&76	830	PG_G		0.66	3.9	78
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',5-Tetrachlorobiphenyl (63)	74472-34-7	23	PG_G		0.61	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4',6-Tetrachlorobiphenyl (64)	52663-58-8	130	PG_G		0.20	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4'-Tetrachlorobiphenyl (66)	32598-10-0	460	PG_G		0.69	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5-Tetrachlorobiphenyl (67)	73575-53-8	12	PG_G	J	0.65	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5'-Tetrachlorobiphenyl (68)	73575-52-7	8.8	PG_G	J	0.62	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',5,5'-Tetrachlorobiphenyl (72)	41464-42-0	10	PG_G	J	0.65	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',5',6-Tetrachlorobiphenyl (73)	74338-23-1	0.97	PG_G	U	0.22	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4'-Tetrachlorobiphenyl (77)	32598-13-3	26	PG_G		0.63	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5-Tetrachlorobiphenyl (78)	70362-49-1	0.97	PG_G	U	0.74	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5'-Tetrachlorobiphenyl (79)	41464-48-6	7.4	PG_G	J	0.63	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',5,5'-Tetrachlorobiphenyl (80)	33284-52-5	0.97	PG_G	U	0.61	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,4,4',5-Tetrachlorobiphenyl (81)	70362-50-4	1.8	PG_G	J	0.63	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4-Pentachlorobiphenyl (82)	52663-62-4	32	PG_G		1.3	1.3	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5-Pentachlorobiphenyl (83)	60145-20-2	1.0	PG_G	U	1.0	1.0	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6-Pentachlorobiphenyl (84)	52663-60-2	21	PG_G		1.2	1.2	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (117/116/85)	117&116&85	270	PG_G		0.86	2.9	58
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (86/87/97/108/119/125)	86&87&97&108&	470	PG_G		0.93	5.8	120
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (88/91)	88&91	71	PG_G		1.0	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6'-Pentachlorobiphenyl (89)	73575-57-2	1.2	PG_G	U	1.2	1.2	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (113/90/101)	113&90&101	1400	PG_G		0.94	2.9	58
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,5'-Pentachlorobiphenyl (92)	52663-61-3	110	PG_G		1.1	1.1	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (93/100)	93&100	9.5	PG_G	J	1.0	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6'-Pentachlorobiphenyl (94)	73575-55-0	1.1	PG_G	U	1.1	1.1	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5',6-Pentachlorobiphenyl (95)	38379-99-6	120	PG_G		1.1	1.1	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,6,6'-Pentachlorobiphenyl (96)	73575-54-9	0.97	PG_G	U	0.18	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (98/102)	98&102	5.4	PG_G	J	1.1	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5-Pentachlorobiphenyl (99)	38380-01-7	1200	PG_G		0.94	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,5',6-Pentachlorobiphenyl (103)	60145-21-3	3.6	PG_G	J	0.97	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,6,6'-Pentachlorobiphenyl (104)	56558-16-8	0.97	PG_G	U	0.20	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4'-Pentachlorobiphenyl (105)	32598-14-4	740	PG_G		0.78	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5-Pentachlorobiphenyl (106)	70424-69-0	1.9	PG_G	U	1.0	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,6-Pentachlorobiphenyl (109)	74472-35-8	150	PG_G		0.66	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (107/124)	107&124	55	PG_G		0.82	5.8	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (110/115)	110&115	1600	PG_G		0.86	1.9	39

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5'-Pentachlorobiphenyl (111)	39635-32-0	0.97	PG_G	U	0.78	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,6-Pentachlorobiphenyl (112)	74472-36-9	1.0	PG_G	U	1.0	1.0	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,4,4',5-Pentachlorobiphenyl (114)	74472-37-0	39	PG_G		0.78	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5,5'-Pentachlorobiphenyl (120)	68194-12-7	11	PG_G	J	0.78	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,5',6-Pentachlorobiphenyl (121)	56558-18-0	0.97	PG_G	U	0.78	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5'-Pentachlorobiphenyl (122)	76842-07-4	19	PG_G	J	0.82	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5'-Pentachlorobiphenyl (123)	65510-44-3	26	PG_G		0.78	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5-Pentachlorobiphenyl (126)	57465-28-8	6.0	PG_G		0.92	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,5,5'-Pentachlorobiphenyl (127)	39635-33-1	0.97	PG_G	U	0.82	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (128/166)	128&166	270	PG_G		0.34	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (138/163/129)	138&163&129	1900	PG_G		0.34	2.9	58
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5'-Hexachlorobiphenyl (130)	52663-66-8	77	PG_G		0.45	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6-Hexachlorobiphenyl (131)	61798-70-7	3.6	PG_G	J	0.43	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6'-Hexachlorobiphenyl (132)	38380-05-1	62	PG_G		0.42	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5'-Hexachlorobiphenyl (133)	35694-04-3	21	PG_G		0.42	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (134/143)	134&143	7.0	PG_G	J	0.46	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (151/135)	151&135	69	PG_G		0.39	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',6,6'-Hexachlorobiphenyl (136)	38411-22-2	4.7	PG_G	J	0.30	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5-Hexachlorobiphenyl (137)	35694-06-5	55	PG_G		0.31	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (139/140)	139&140	33	PG_G		0.37	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5'-Hexachlorobiphenyl (141)	52712-04-6	110	PG_G		0.48	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6-Hexachlorobiphenyl (142)	41411-61-4	0.97	PG_G	U	0.50	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5',6-Hexachlorobiphenyl (144)	68194-14-9	15	PG_G	J	0.38	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,6,6'-Hexachlorobiphenyl (145)	74472-40-5	0.97	PG_G	U	0.29	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5'-Hexachlorobiphenyl (146)	51908-16-8	270	PG_G		0.31	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (147/149)	147&149	530	PG_G		0.37	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6'-Hexachlorobiphenyl (148)	74472-41-6	0.97	PG_G	U	0.37	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',6,6'-Hexachlorobiphenyl (150)	68194-08-1	0.97	PG_G	U	0.28	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,5,6,6'-Hexachlorobiphenyl (152)	68194-09-2	0.97	PG_G	U	0.27	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (153/168)	153&168	1700	PG_G		0.30	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',5,6'-Hexachlorobiphenyl (154)	60145-22-4	23	PG_G		0.36	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',4,4',6,6'-Hexachlorobiphenyl (155)	33979-03-2	0.97	PG_G	U	0.29	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (156/157)	156&157	340	PG_G		0.80	1.9	3.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',6-Hexachlorobiphenyl (158)	74472-42-7	230	PG_G		0.30	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5'-Hexachlorobiphenyl (159)	39635-35-3	0.97	PG_G	U	0.66	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,6-Hexachlorobiphenyl (160)	41411-62-5	0.97	PG_G	U	0.38	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5',6-Hexachlorobiphenyl (161)	74472-43-8	0.97	PG_G	U	0.38	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5,5'-Hexachlorobiphenyl (162)	39635-34-2	11	PG_G	J	0.67	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4',5',6-Hexachlorobiphenyl (164)	74472-45-0	70	PG_G		0.39	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',5,5',6-Hexachlorobiphenyl (165)	74472-46-1	0.97	PG_G	U	0.32	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	52663-72-6	110	PG_G		0.57	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	32774-16-6	0.97	PG_G	U	0.75	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	35065-30-6	150	PG_G		0.68	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (171/173)	171&173	62	PG_G		0.69	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	52663-74-8	40	PG_G		0.65	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	38411-25-5	40	PG_G		0.79	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	40186-70-7	4.5	PG_G	J	0.23	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	52663-65-7	2.5	PG_G	J	0.17	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	52663-70-4	76	PG_G		0.67	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	52663-67-9	26	PG_G		0.24	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	52663-64-6	5.2	PG_G	J	0.18	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (180/193)	180&193	390	PG_G		0.55	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	74472-47-2	3.7	PG_G	J	0.55	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	60145-23-5	1.5	PG_G	J	0.23	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	52663-69-1	99	PG_G		0.42	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	74472-48-3	0.97	PG_G	U	0.19	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	52712-05-7	6.4	PG_G	J	0.71	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	74472-49-4	0.97	PG_G	U	0.18	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	52663-68-0	270	PG_G		0.20	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	74487-85-7	1.9	PG_G	J	0.21	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	39635-31-9	7.4	PG_G		0.24	0.97	1.9
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	41411-64-7	28	PG_G		0.45	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	74472-50-7	9.2	PG_G	J	0.49	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	74472-51-8	0.97	PG_G	U	0.52	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	35694-08-7	43	PG_G		0.40	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	52663-78-2	12	PG_G	J	0.41	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	42740-50-1	30	PG_G		0.19	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	33091-17-7	2.7	PG_G	J	0.12	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Congeners (198/199)	198&199	92	PG_G		0.21	1.9	39
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	52663-73-7	1.9	PG_G	U	0.20	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	40186-71-8	9.8	PG_G	J	0.15	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	2136-99-4	18	PG_G	J	0.17	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	52663-76-0	31	PG_G		0.21	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	74472-52-9	0.97	PG_G	U	0.15	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	74472-53-0	0.97	PG_G	U	0.28	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	40186-72-9	14	PG_G	J	0.63	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	52663-79-3	4.9	PG_G	J	0.41	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	52663-77-1	10	PG_G	J	0.39	0.97	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	Decachlorobiphenyl (209)	2051-24-3	9.8	PG_G	J	0.18	1.9	19
VWW06-CRB04-0112	PCBCONG	T	01/31/2012 00:00	2,3',4,4',5-Pentachlorobiphenyl (118)	31508-00-6	2400	PG_G		1.2	2.0	3.9
VWW06-CRB01-0112	METAL	T	01/31/2012 00:00	Lead	7439-92-1	5.14	MG_KG		0.004	0.007	0.037
VWW06-CRB01P-0112	METAL	T	01/31/2012 00:00	Lead	7439-92-1	4.12	MG_KG		0.004	0.007	0.037
VWW06-CRB02-0112	METAL	T	01/31/2012 00:00	Lead	7439-92-1	3.55	MG_KG		0.004	0.007	0.037
VWW06-CRB03-0112	METAL	T	01/31/2012 00:00	Lead	7439-92-1	2.07	MG_KG		0.004	0.008	0.040
VWW06-CRB04-0112	METAL	T	01/31/2012 00:00	Lead	7439-92-1	2.15	MG_KG		0.004	0.008	0.042
VWW06-FS01-0112	METAL	T	01/31/12	Lead	7439-92-1	0.097	MG_KG	J	0.004	0.008	0.040
VWW06-FS01P-0112	METAL	T	01/31/2012 00:00	Lead	7439-92-1	0.055	MG_KG	J	0.004	0.008	0.040
VWW06-FS02-0212	METAL	T	02/01/2012 00:00	Lead	7439-92-1	0.057	MG_KG		0.004	0.008	0.039
VWW06-FS03-0212	METAL	T	02/01/2012 00:00	Lead	7439-92-1	1.65	MG_KG	J	0.004	0.008	0.038
VWW06-FS04-0112	METAL	T	01/31/2012 00:00	Lead	7439-92-1	0.271	MG_KG		0.004	0.008	0.038
VWW06-CRB01-0112	METAL	T	01/31/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.007
VWW06-CRB01P-0112	METAL	T	01/31/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.007
VWW06-CRB02-0112	METAL	T	01/31/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.007
VWW06-CRB03-0112	METAL	T	01/31/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.008
VWW06-CRB04-0112	METAL	T	01/31/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.008
VWW06-FS01-0112	METAL	T	01/31/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.008
VWW06-FS01P-0112	METAL	T	01/31/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.008
VWW06-FS02-0212	METAL	T	02/01/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.008
VWW06-FS03-0212	METAL	T	02/01/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.008
VWW06-FS04-0112	METAL	T	01/31/2012 00:00	Thallium	7440-28-0	0.004	MG_KG	U	0.002	0.004	0.008

Attachment E-8

Analytical Data Used in the SWMU 6 HHRA (Fish, Blue Crab)

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Sample Name	Analysis Group	Sample Medium	Date/Time Collected	Chemical Name	Analyte ID	Analyte Value	Result Units	Validator Qualifier	DL	LOD	LOQ
VWW06-CRB01-0112	METAL	T	01/31/2012 00:00	Zinc	7440-66-6	21.6	MG_KG		0.26	0.67	0.93
VWW06-CRB01P-0112	METAL	T	01/31/2012 00:00	Zinc	7440-66-6	20.3	MG_KG		0.26	0.67	0.93
VWW06-CRB02-0112	METAL	T	01/31/2012 00:00	Zinc	7440-66-6	19.3	MG_KG		0.26	0.66	0.93
VWW06-CRB03-0112	METAL	T	01/31/2012 00:00	Zinc	7440-66-6	26.4	MG_KG		0.28	0.71	0.99
VWW06-CRB04-0112	METAL	T	01/31/2012 00:00	Zinc	7440-66-6	26.6	MG_KG		0.29	0.75	1.04
VWW06-FS01-0112	METAL	T	01/31/2012 00:00	Zinc	7440-66-6	16.9	MG_KG	J	0.28	0.71	0.99
VWW06-FS01P-0112	METAL	T	01/31/2012 00:00	Zinc	7440-66-6	10.8	MG_KG	J	0.28	0.72	1.00
VWW06-FS02-0212	METAL	T	02/01/2012 00:00	Zinc	7440-66-6	16.1	MG_KG		0.28	0.71	0.98
VWW06-FS03-0212	METAL	T	02/01/2012 00:00	Zinc	7440-66-6	15.5	MG_KG		0.27	0.69	0.95
VWW06-FS04-0112	METAL	T	01/31/2012 00:00	Zinc	7440-66-6	13.5	MG_KG		0.26	0.68	0.95

Appendix F
Post-Removal Ecological Risk Assessment

APPENDIX F

Ecological Risk Assessment

1.1 Introduction

This appendix contains a screening ecological risk assessment (SERA), constituting Steps 1 and 2 of the ecological risk assessment (ERA) process, and the first step (Step 3A) of a baseline ecological risk assessment (BERA) for Solid Waste Management Unit (SWMU) 6. SWMU 6 is located within the former Naval Ammunition Support Detachment (NASD), Vieques, Puerto Rico.

The approach, methods, and assumptions used for this ERA were based upon the final ERA protocol presented in the *Master Standard Operating Procedures, Protocols, and Plans* (CH2M HILL, 2010a), the *Master Ecological Risk Assessment Protocol for Vieques Environmental Restoration Program – Update 1 (Addendum)* (CH2M HILL, 2010b), the ERA interim deliverable for SWMU 6 (CH2M HILL, 2011a), and the regulator comments on the interim deliverable.

1.1.1 Ecological Risk Assessment Process

This ERA was conducted in accordance with the *Navy Policy for Conducting Ecological Risk Assessments* (CNO, 1999) and the Navy guidance for implementing this ERA policy (NAVFAC, 2003). The Navy ERA policy and guidance, which describe a process consisting of eight steps organized into three tiers, are conceptually similar to the eight-step ERA process outlined in U.S. Environmental Protection Agency (USEPA) ERA guidance for the Superfund program (USEPA, 1997a). For both sets of guidance, Steps 1 and 2 involve conducting a SERA using very conservative assumptions. The BERA represents Steps 3 through 7. The BERA uses more realistic assumptions and site-specific data to refine the risk estimates from the SERA for components that fail the initial screen. Step 8 addresses risk management issues. The major differences between the Navy ERA policy/guidance and the USEPA ERA guidance are:

1. The Navy policy/guidance provides clearly defined criteria for exiting the ERA process at specific points.
2. The Navy policy/guidance divides Step 3 (the first step of the BERA) into two distinct sub-steps (Steps 3A and 3B), with a potential exit point after Step 3A.
3. The Navy policy/guidance incorporates risk management considerations throughout all tiers of the ERA process.

ERAs are conducted using a tiered, step-wise approach and are punctuated with Scientific Management Decision Points (SMDPs). SMDPs represent points in the ERA process where agreement on conclusions, actions, or methodologies is needed so that the ERA process can continue (or terminate) in a technically defensible manner. The results of the ERA at a particular SMDP are used to determine how the ERA process should proceed, for example, to the next step in the process or directly to a later step. The process continues until a final decision has been reached (i.e., remedial action or controls if unacceptable risks are identified, or no further action if risks are acceptable). The process can also be iterative if data needs are identified at any step; the needed data are collected and the process starts again at the point appropriate to the type of data collected.

The screening (preliminary) problem formulation is the first step of an ERA and establishes the goals, scope, and focus of the SERA. As part of problem formulation, the environmental setting of the site is characterized in terms of the habitats and biota known or likely to be present. The types and concentrations of chemicals that are present in ecologically relevant media (such as surface water, surface sediment, and surface soil) are also described. A preliminary conceptual model is developed that describes potential source areas, potential transport pathways (the mechanisms whereby chemicals may be transported from a source of contamination to ecologically relevant media), potential exposure pathways (an exposure pathway links a potential source of contamination with one or more receptors through exposure via one or more media and exposure routes), potential exposure routes (e.g., ingestion), and potential receptors. Assessment endpoints, measurement endpoints, and risk hypotheses are then selected to evaluate those receptors for which complete and potentially significant exposure

pathways are likely to exist[1]. The fate, transport, and toxicological properties of the chemicals present at the site, particularly the potential for bioaccumulation, are also considered during the problem formulation process.

Step 1 of the ERA process is intended to answer two main questions:

1. Do complete exposure pathways exist?
2. Are sufficient data available to conduct the SERA?

If no complete exposure pathways exist, the ERA process terminates at Step 1 with a conclusion of negligible (acceptable) risk because exposure, and thus potential risk, can only occur if complete exposure pathways exist. If one or more complete exposure pathways are known to exist, or are likely to exist, the ERA process continues to Step 2 but only evaluates those pathways that have been determined to be "critical" (ecologically important), that is, represent exposures to sensitive receptors that are associated with the predominant fate and transport mechanisms at the site (USEPA, 1997a). An evaluation of the available data is then conducted to determine if they are adequate to support the SERA. If not, additional data are collected before the ERA process continues. The second step of the ERA process involves conducting a screening exposure assessment, a screening effects assessment, and a screening risk calculation (risk characterization) based upon very conservative assumptions.

The results of the SERA are used to evaluate the potential for unacceptable ecological risks based upon very conservative assumptions. If the results of the SERA suggest that further ecological risk evaluation is warranted, the ERA process proceeds to the BERA (Steps 3 through 7), which is a more detailed phase of the ERA process, for the pathways, chemicals, receptors, and areas identified in the SERA. As indicated above, the first step of the BERA (Step 3) is divided into two distinct sub-steps (3A and 3B) in Navy ERA guidance.

Step 3 of the USEPA ERA guidance consists of the following activities (USEPA, 1997a):

1. Refinement of the Chemicals of Potential Concern (COPCs) from the SERA.
2. Further characterizing the potential ecological effects of contaminants.
3. Refining information on contaminant fate and transport, complete exposure pathways, and receptors potentially at risk.
4. Selecting assessment endpoints.
5. Refining the conceptual model and risk hypotheses from the SERA.

Step 3A of the Navy policy/guidance (refinement of conservative exposure assumptions) corresponds to the first activity listed above for the USEPA ERA guidance. In Step 3A, a refined evaluation of exposure estimates is conducted using more realistic assumptions and additional methodologies relative to those used in the SERA, which is intended to be a very conservative assessment. Examples of more realistic exposure assumptions include using central tendency (e.g., mean) estimates (rather than maximums) for media concentrations, bioaccumulation factors, and exposure parameters. Examples of additional methodologies include consideration of background and upgradient concentrations, bioavailability, and detection frequency (CNO, 1999; NAVFAC, 2003).

If risk estimates (and their associated uncertainty) are acceptable following Step 3A, the site will meet the conditions of the exit criterion specified in the Navy guidance. If the Step 3A evaluation does not support a determination of acceptable risk within acceptable uncertainty, the site continues to Step 3B.

Step 3B of the Navy policy/guidance (problem formulation) corresponds conceptually to the last four activities of Step 3 listed above for the USEPA ERA guidance. In Step 3B, the preliminary conceptual model from the SERA is refined based upon the results of the Step 3A evaluation to develop a revised list of key receptors, critical exposure pathways, key COPCs, assessment endpoints, measurement endpoints, and risk hypotheses. Based upon the refined conceptual model, the lines of evidence to be used in characterizing risk are determined. Agreement

[1] An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic that is related to the component or value chosen as the assessment endpoint. Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants or other stressors.

on the refined conceptual model, COPCs, exposure pathways, endpoints, and risk hypotheses constitutes the SMDP at the end of Step 3 in both Navy and USEPA ERA guidance.

Following the completion of Step 3, a decision point is reached with two potential outcomes. If the refined risk estimates are acceptable for each selected assessment endpoint, the investigation proceeds to risk characterization (Step 7) to document this conclusion and the ERA process terminates. If the uncertainties associated with the refined risk estimates are unacceptable and/or the risk estimates indicate that unacceptable risks may exist, site-specific studies might be required and the ERA process continues (Steps 4 through 6). Step 4 is a work planning step where additional site-specific studies are scoped and designed. Step 5 consists of the verification of the field sampling design developed in Step 4 while Step 6 constitutes the site investigation and data analysis phase of the process. The scope (e.g., spatial extent of sampling) and components (e.g., collection of biological data, such as tissue samples, toxicity testing, etc.) of any site-specific studies are determined by the conclusions of Step 3 and the pathways/endpoints associated with the potential unacceptable risks.

Step 7 consists of the documentation and synthesis of the information and data identified in Steps 1 through 3 (no additional study) or Steps 1 through 6 (additional study). In this step, risk is evaluated and characterized using both quantitative and qualitative methods. Conclusions are made as to whether there is a reasonable potential for unacceptable ecological risk and, if there is a potential for unacceptable ecological risk, the magnitude of that risk. The results of the completed BERA (Step 7) are used to make necessary risk management decisions (Step 8) related to current or future risks. Possible decisions include:

- Adequate information exists to conclude that no unacceptable ecological risks exist. The assessment should stop at Step 7.
- Adequate information exists to conclude that unacceptable ecological risks exist for which remedial actions or controls are warranted. Whether remedial actions or controls are taken, and the specific actions or controls taken, will depend upon a number of risk management factors such as the results of human health risk assessments (if applicable) and the potential impact of the remedial action or control itself on the habitats and biota present. This analysis would occur as part of Step 8.
- Adequate information does not exist to estimate risk or the risk estimate is believed to be too conservative or uncertain to recommend remediation. The assessment should be refined.

1.2 Problem Formulation

Problem formulation establishes the goals, scope, and focus of the ERA. As part of problem formulation, the ecological setting of SWMU 6 is characterized in terms of the habitats and biota known or likely to be present. The types and concentrations of chemicals that are present in ecologically relevant media (surface soil, surface water, and sediment) are also described based upon available analytical data. A conceptual site model is developed that describes source areas, transport pathways and exposure media, exposure pathways and routes, and receptors. Assessment endpoints, measurement endpoints, and risk hypotheses are developed to evaluate those receptors for which critical exposure pathways exist. The fate, transport, and toxicological properties of the chemicals present at SWMU 6, particularly the potential for bioaccumulation, are also considered during this process.

1.2.1 Ecological Setting

SWMU 6, the Former Mangrove Disposal Site, is located in a mangrove swamp between two tidally influenced lagoons of the Laguna Kiani complex (Laguna Kiani and Laguna El Pobre), along Highway 200 on the former NASD (**Figure F-1**). The site was used for the disposal of general solid waste during the 1960s and 1970s from Navy operations within the former NASD. Waste discarded at the site included empty containers of lubricants, oil, solvents, and paints; broken glass; and rubble. A removal action was conducted in 2009 to remove the waste debris and impacted soils. Excavation activities resulted in the ecological setting changing from an estuarine, intertidal, forested wetland dominated by black mangrove to a shallow, open water lagoon (SWMU 6 lagoon) that is hydraulically connected to, and tidally influenced by, the adjacent Laguna Kiani complex (Laguna Kiani and Laguna El Pobre). The site now supports a relatively diverse community of marine fish, macroinvertebrates (such as blue crabs, hermit crabs, fiddler crabs, and mollusks), foraging wildlife (such as wading birds), and recently

planted and naturally established mangrove seedlings. Limited upland habitat occurs at the southern fringe of SWMU 6, primarily in association with the elevated roadbed supporting Highway 200.

The topography of SWMU 6 is relatively flat since it occurs within the low-lying coastal zone of sedimentary deposits that occupies the northwest corner of the island. The site is hydraulically connected to the Vieques Passage approximately 800 feet to the north via the Laguna Kiani complex, and therefore experiences daily tidal cycles that can average about 0.6 foot. Water depth within the SWMU 6 lagoon averages about 1 foot, with the deepest point in the middle (up to approximately 3 feet). Water parameters, as measured on February 3, 2011, indicated a mean salinity of 31.1 parts per thousand (ppt), and mean dissolved oxygen of 5.1 milligrams per liter (mg/L) within the SWMU 6 lagoon; **Table F-1** provides the detailed field parameter results for all SWMU 6 stations. Typically, the SWMU 6 lagoon contains about 0.4 acre of open water, along with about 0.1 acre of intertidal mudflat. **Table F-2** summarizes sediment physical parameters as analyzed in the laboratory. A small area (approximately 1,500 ft^2) of disturbed upland occurs at the southeastern corner of SWMU 6.

1.2.1.1 Habitats and Biota

The description of the ecological setting is based primarily on environmental and biological data gathered during the post-removal supplemental confirmatory sampling event conducted in February 2011. Observations made during this and prior visits to SWMU 6 and nearby similar habitats are also included.

Flora

Prior to debris and soil excavation activities, SWMU 6 was entirely vegetated with mangroves, with black mangrove (*Avicennia germinans*) occurring across the more elevated interior of the site and red mangrove (*Rhizophora mangle*) occurring along the more permanently inundated western and northern boundaries. Excavation activities resulted in the removal of the interior mangroves and the lowering of the site elevation such that the area is now fully inundated at high tide. Under current conditions, a dense stand of black and red mangroves outlines the newly formed open lagoon, except for the southern border along Highway 200, which is mostly unvegetated. This southern border is predominantly a 10 to 15 foot sloped roadside buffer, much of which is covered by a fibrous erosion control fabric (the result of a recent road and bridge improvement project), and along which herbaceous ground cover is becoming established, currently at about 5 to 10 percent cover. Red mangrove seedlings were planted by USFWS in 2009 throughout the intertidal zone and have been growing rapidly. In addition, an abundance of black mangrove seedlings and a few red mangrove seedlings have become naturally established in this zone. No other submergent or emergent aquatic vegetation was observed in this newly formed lagoon. **Table F-3** lists the vegetation observed at SWMU 6 during the February 2011 field studies.

The hydrologic connection at the north side of the SWMU 6 lagoon is shallow (less than 1 foot) and heavily vegetated with a dense strip of red mangrove about 10 feet wide. The offsite Laguna Kiani complex lobe immediately north of the vegetated strip (represented by sampling stations SW001 and SW002 on **Figure F-2**) is shallow (average 1.7 feet), small (approximately 0.1 acre), and contains a sparse stand of turtle grass (*Thalassia testudinum*).

The small, disturbed upland portion of SWMU 6 contains a few plant species including various grasses, tropical sedge (*Fimbristylis cymosa*), seaside purslane (*Sesuvium portulacastrum*), and *Acacia spp*.

Fauna

Table F-3 lists the wildlife observed at SWMU 6 during the February 2011 field studies, as well as at nearby similar habitats at Laguna Punta Arenas, Laguna Kiani, and Laguna El Pobre.

The shallow, open lagoon habitat at SWMU 6 currently contains a variety of fish and macroinvertebrates. Fish commonly observed or captured included white mullet (*Mugil curema*), bigeye mojarra (*Eucinostomus havana*), and checkered puffer (*Sphoeroides testudineus*). Other fish species were observed but were not able to be captured. Based on observations in nearby similar habitats, additional fish likely present include spotfin mojarra (*Eucinostomus argenteus*), striped mojarra (*Diapterus plumieri*), bigeye anchovy (*Anchoa lamprotaenia*), crested goby (*Lophiogobius cyprinoides*), and redfin needlefish (*Strongylura notata*). Though snook (*Centropomus*

undecimalis) were not observed directly within SWMU 6, they were found to be abundant in the adjacent Laguna Kiani complex and thus may occasionally occur onsite.

The common macroinvertebrates collected included blue crab (*Callinectes sapidus*), Caribbean fiddler crab (*Uca rapax*), grass shrimp (*Palaeomonetes* sp.), an unknown species of hermit crab, coffee bean snail (*Melampus coffeus*), and upside-down jellyfish (*Cassiopeia xamachana*). Other benthic macroinvertebrates that may occur, though not directly observed during qualitative collection activities, include various polychaetes, sponges, tunicates, amphipods, barnacles, and other species of crabs and mollusks.

1.2.1.2 Rare, Threatened, and Endangered Species

Thirteen federally listed species are known to occur or have the potential to occur on or near NASD Vieques (**Table F-4**). Based on the habitat requirements of these species, only the endangered plant Cobana negra (*Stahlia monosperma*) has the potential to occur at or near SWMU 6. Cobana negra is typically found on the edge of salt flats in brackish, seasonally flooded wetlands, and associated with black mangrove and buttonwood mangrove (*Conocarpus erectus*). Qualitative ecological surveys of habitats within and adjacent to SWMU 6 were conducted by CH2M HILL biologists, both by foot and by canoe. No specimens of Cobana negra were found. The nearest known specimens occur approximately 0.5 mile east of SWMU 6, at the edge of Laguna Kiani south of Highway 200.

1.2.2 Data Used in the ERA

SMWU 6 samples evaluated in this ERA are listed in **Table F-5,** and their locations are shown on **Figure F-2**. The analytical data for these samples are included in **Attachment A, Table A-1-1** (surface water), **A-1-2** (sediment), **A-1-3** (surface soil), and **A-1-4** (PCB removal area sediment). Onsite SWMU 6 samples included those collected from five marine surface water, eight marine sediment, and two surface soil stations. These stations all occurred within the area previously disturbed by debris and soil removal activities, on the north side of Highway 200. Offsite marine surface water and sediment samples were collected at two stations (SW/SD001 and SW/SD002) within a lobe off of the Laguna Kiani complex where SWMU 6 connects with the Laguna Kiani complex. These offsite stations represent an area for evaluating potential transport of constituents of interest from SWMU 6. Confirmatory samples SS012 and SS013 were collected at two former debris pile areas along the south side of Highway 200 to verify the effectiveness of recent (February 2, 2011) PCB-contaminated soil removal. The action included the removal of 12 inches of surface soil, and resulted in two shallow depressions partially filled with water and surrounded by mangrove trees and an abundance of fiddler crab burrows. As a result, the confirmatory medium sampled at these locations was considered marine sediment for this ERA and evaluated separately from the marine sediments on the north side of Highway 200 because of their isolated nature.

Background surface water and sediment samples are also included in **Table F-5**, and their locations are shown on **Figure F-3**. The analytical data for these samples are included in **Attachment A, Table A-1-5** (surface water) and **A-1-6** (sediment). These ten background marine surface water and sediment samples were collected from nearby lagoons with similar aquatic settings to the SWMU 6 lagoon: (1) three from Laguna Kiani (SW/SD018 through SW/SD020); (2) three from Laguna El Pobre (SW/SD021 through SW/SD023); and (3) four from Laguna Punta Arenas (SW/SD014 through SW/SD017), which is located approximately 0.5 miles west of the site, adjacent to Highway 200. Background samples were analyzed for inorganic constituents and pesticides, and are considered in the risk characterization of this ERA (Section 1.5).

A comparison of the 2011 post-removal supplemental confirmatory sediment data with a combined data set of the 2009 post-removal sampling data and the 2011 data is provided in Section 1.5. The purpose of this evaluation is to demonstrate the appropriateness of quantitatively evaluating only the 2011 sediment data in this ERA. In 2009, 13 post-debris removal sediment samples were collected; analytical data are provided in Attachment A, Table A-1-7.

1.2.3 Conceptual Site Model

The conceptual site model (CSM) relates potentially exposed receptor populations with potential source areas based upon physical site characteristics and complete exposure pathways. Important components of the CSM are the identification of potential source areas, transport pathways, exposure media, exposure pathways and routes,

and receptors. Actual or potential exposures of ecological receptors associated with a site are determined by identifying the most likely, and most important, mechanisms and pathways of contaminant release and transport. A complete exposure pathway has three components: (1) a source of chemicals that results in a release to the environment; (2) a pathway of chemical transport through an environmental medium; and (3) an exposure or contact point for an ecological receptor. **Figure F-4** illustrates a diagrammatic conceptual site model for SWMU 6. Key components of this CSM are discussed in the following subsections.

1.2.3.1 Potential Source Areas

SWMU 6 was used for the disposal of general solid waste during the 1960s and 1970s, which was primarily comprised of empty containers of lubricants, oil, solvents, and paints; broken glass; and rubble. Historically, this solid waste debris was the potential contaminant source at the site. Although the debris and associated soils were removed from the site in 2009, residual sediment or soil contamination may be present that could pose potential risks to ecological receptors.

Two debris removal locations on the south side of Highway 200 were found to have elevated PCB concentrations during 2009 post-removal sampling. A second removal action of the upper 12 inches of soil was conducted in February 2011, followed by confirmatory sampling for analysis of PCBs. These former debris locations are considered a separate exposure area for PCBs, and are evaluated separate from the removal area (lagoon) on the north side of the road.

1.2.3.2 Transport Pathways and Exposure Media

A transport pathway describes the mechanisms whereby site-related chemicals, once released, may be transported from a source to ecologically relevant media (such as surface sediment) where exposed may occur. These transport pathways are shown on **Figure F-4**. The primary transport pathway applicable to this ERA is transport of site-related chemicals in surface water and suspended sediment from SWMU 6 into the adjacent Laguna Kiani complex. The post-removal sediment, overlying water, and a small area of surface soils within the removal area, as well as sediment within the PCB soil removal area on the south side of Highway 200, constitute the primary exposure media for this ERA. Groundwater is generally considered only as a transport medium since there are no direct ecological exposures to groundwater until it discharges to a water body or surfaces as a seep. Air is not addressed in this ERA since this medium is not likely to result in significant contributions to total exposures.

1.2.3.3 Exposure Pathways and Routes

An exposure pathway links a source of contamination with one or more receptors through exposure via one or more media and exposure routes. Exposure, and thus potential risk, can only occur if complete exposure pathways exist. **Figure F-4** shows the potentially complete exposure pathways to ecological receptors at SWMU 6.

An exposure route describes the specific mechanism(s) by which a receptor is exposed to a chemical present in an environmental medium. The most common exposure routes are dermal contact, direct uptake, ingestion, and inhalation. Terrestrial plants may be exposed to chemicals present in surface soils through their root surfaces during water and nutrient uptake. Unrooted, floating aquatic plants, rooted submerged vascular aquatic plants, and algae may be exposed to chemicals directly from the water or (for rooted plants) from sediment. Terrestrial and aquatic invertebrates may be exposed to chemicals in surface soil, surface sediment, and/or surface water through dermal contact and ingestion.

Potentially complete exposure pathways exist for aquatic receptors exposed to surface water and sediment in the SWMU 6 lagoon. Receptor groups evaluated in this ERA include fish, benthic invertebrates, aquatic plants, birds, and mammals. Potentially complete exposure pathways exist for terrestrial receptors exposed to surface soil at SWMU 6. Receptor groups evaluated in this ERA include terrestrial plants and soil invertebrates.

Animals may be exposed to chemicals through the: (1) inhalation of gaseous chemicals or of chemicals adhered to airborne particulate matter; (2) incidental ingestion of contaminated abiotic media (soil and/or sediment) during feeding or preening activities; (3) ingestion of contaminated water; (4) ingestion of contaminated plant and/or animal tissues for chemicals that have entered food webs; and/or (5) dermal contact with contaminated abiotic media. These routes, where applicable, are depicted on **Figure F-4**.

Direct contact is the primary exposure route for lower trophic level receptors (e.g., plants; benthic and soil invertebrates) at the site. Incidental ingestion of sediment and exposure via aquatic food webs are the primary exposure routes for upper trophic level receptors (e.g., wading birds) in the SWMU 6 lagoon. Potentially affected upland habitat at the site, however, is limited to a small roadside area approximately 1,500 ft^2 in size. Direct exposure of terrestrial plants and soil invertebrates can occur within this area, however, exposure to terrestrial wildlife via the food web is not considered significant due to the small size of the potential exposure area. The two PCB removal locations on the south side of Highway 200 are evaluated as a separate exposure area. Potentially complete exposure pathways to marine sediment exist in these areas for lower trophic level receptors (direct contact for aquatic plants and benthic invertebrates). However, exposure to wildlife via the food web is not considered significant due to the small size of the exposure area (approximately 725 ft^2).

The following pathways are not evaluated for wildlife receptors in the ERA:

- The contribution to the total dose from the inhalation route is generally insignificant for upper trophic level ecological receptors relative to ingestion pathways. Thus, the air (inhalation) pathway was not evaluated for ecological receptors.
- Direct ingestion of drinking water is only considered when a permanent or semi-permanent source of water with a salinity below 15 parts per thousand (ppt), the approximate toxic threshold for wildlife receptors (Humphreys, 1988), exists on a site. Based upon available data (**Table F-1**), the average salinity in the SWMU 6 lagoon was 31.15 ppt, which is above this threshold. Thus, exposure via direct ingestion of drinking water was not included in the ERA.
- Exposure to chemicals present in surface sediment via dermal contact may occur but is unlikely to represent a major exposure pathway for most upper trophic level receptors because fur or feathers minimize transfer of chemicals across dermal tissue. Thus, dermal contact was not evaluated for upper trophic level receptors in the ERA. Incidental ingestion of surface sediment during feeding, preening, or grooming activities was, however, considered in the risk estimates. Direct contact was considered for lower trophic level receptors (benthic invertebrates).

1.2.3.4 Receptors

Because of the complexity of natural systems, it is generally not possible to directly assess the potential impacts to all ecological receptors present at a site. Therefore, specific receptor species (e.g., green heron) or species groups (e.g., fish) are often selected as surrogates to evaluate potential risks to larger components of the ecological community (guilds; such as piscivorous birds) used to represent the assessment endpoints (e.g., survival and reproduction of piscivorous birds). Selection criteria typically include those species that:

- Are known to occur, or are likely to occur, at the site.
- Have a particular ecological, economic, or aesthetic value.
- Are representative of taxonomic groups, life history traits, and/or trophic levels in the habitats present for which complete exposure pathways are likely to exist.
- Can, because of toxicological sensitivity or potential exposure magnitude, be expected to represent potentially sensitive populations.

Upper trophic level receptor species quantitatively evaluated in the ERA were limited to birds and mammals, the taxonomic groups with the most available information regarding exposure and toxicological effects. The following upper trophic level receptors were selected for exposure modeling in aquatic habitats based upon the criteria listed above and the habitats likely to be present on the site long-term:

- Spotted sandpiper (*Actitis macularia*) – aquatic avian invertivore
- Green heron (*Butorides virescens*) - aquatic avian invertivore/piscivore
- Fishing bat (*Noctilio leporinus*) - mammalian piscivore

Lower trophic level receptor species were evaluated based upon those taxonomic groupings for which medium-specific ecological screening values (ESVs) have been developed. As such, specific species of aquatic biota (plants, fish, and benthic invertebrates) were not chosen as receptors because of the limited information available for specific species and because aquatic biota were evaluated on a community level via a comparison of surface water and sediment concentrations with medium-specific ESVs. Similarly, specific species of terrestrial biota (plants and soil invertebrates) were not chosen as receptors because of the limited information available for specific species and because these receptors were evaluated on a community level via a comparison to soil ESVs developed for these groups.

Reptiles are also an applicable receptor group for terrestrial habitats. However, individual species of reptiles were not selected for evaluation because of the very limited amount of available toxicological information for this taxonomic group for direct effects. Potential risks to reptiles from direct contact with surface soil are evaluated using ESVs developed for other taxonomic groups (described above).

1.2.3.5 Endpoints and Risk Hypotheses

The conclusion of the problem formulation includes the selection of ecological endpoints and risk hypotheses, which are based upon the CSM. Two types of endpoints, assessment endpoints and measurement endpoints, are defined as part of the ERA process (USEPA, 1997a). An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic that is related to the component or value chosen as the assessment endpoint. The considerations for selecting assessment and measurement endpoints are summarized in USEPA (1997a) and discussed in detail in Suter (1989, 1990, 1993). Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants.

Endpoints define ecological attributes that are to be protected (assessment endpoints) and measurable characteristics of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has or may occur. Assessment endpoints most often relate to attributes of biological populations or communities, and are intended to focus the risk assessment on particular components of the ecosystem that could be adversely affected by chemicals attributable to a site (USEPA, 1997a). Assessment endpoints contain an entity (e.g., heron population) and an attribute of that entity (e.g., survival rate). Individual assessment endpoints usually encompass a group of species or populations (the receptor) with some common characteristic, such as specific exposure route or contaminant sensitivity, with the receptor then used to represent the assessment endpoint in the risk evaluation.

Assessment and measurement endpoints may involve ecological components from any level of biological organization, from individual organisms to the ecosystem itself. Effects on individual organisms are important for some receptors, such as rare and endangered species; population- and community-level effects are typically more relevant to ecosystems. Population- and community-level effects are usually difficult to evaluate directly without long-term and extensive study. However, measurement endpoint evaluations at the individual level, such as an evaluation of the effects of chemical exposure on reproduction, can be used to predict effects on an assessment endpoint at the population or community level. In addition, use of criteria values designed to protect the majority of the components of a community (e.g., Ambient Water Quality Criteria [AWQC] for the Protection of Aquatic Life) can be useful in evaluating potential community- and/or population-level effects.

Table F-6 shows the assessment endpoints, risk hypotheses, and measurement endpoints used in the ERA. **Table F-6** also shows the receptors associated with each endpoint.

1.3 Exposure Assessment

The principal activity associated with the exposure assessment is the estimation of chemical concentrations in applicable media, termed exposure point concentrations (EPCs), to which the receptors may be exposed. This is accomplished through the selection of appropriate sets of the available analytical data using a set of criteria (e.g., validation status, sampling date). Once the analytical data sets are selected, EPCs are calculated as a particular point on the distribution of concentrations. At the screening level (Step 2), the EPC is the maximum detected

concentration. At the baseline level (Step 3A), EPCs are central tendency estimates (e.g., arithmetic mean). EPCs are then used in bioaccumulation and food web models to estimate exposures to upper trophic level receptors.

For conservatism, the maximum (SERA) and mean (BERA) reporting limits for chemicals analyzed for but not detected were also compared to medium-specific ESVs and (where applicable) used for food web exposure modeling. This was done to determine if reporting limits were less than chemical concentrations at which potential adverse effects to ecological receptors may occur.

1.3.1 Selection Criteria for Analytical Data

Available analytical data (described in Section 1.2.2) were selected for use in the ERA based upon the following:

- Data must have been validated by a qualified data validator using acceptable data validation methods. Rejected (R) values were not used in the ERA. Unqualified data and data qualified as J (estimated), L (biased low), or K (biased high) were treated as detected. Data qualified as U (undetected) or B (blank contamination) were treated as non-detected.
- For samples with duplicate analyses, the higher of the two concentrations was used when both values were detects or when both values were non-detects. In cases where one result was a detect and the other a non-detect, the detected value was used in the assessment.
- For non-detected results, the limit of detection (LOD) was used to represent the concentration. When calculating statistics (e.g., arithmetic mean), one-half of the LOD was used for non-detected results.

1.3.2 Data Groupings

Surface soil, surface water, and surface sediment data were partitioned into the following spatial groups:

- **Surface soil –** The two post-removal soil samples collected at SWMU 6 from depths of 0-6 inches.
- **Surface water (onsite) –** Five 2011 samples collected from the SWMU 6 lagoon.
- **Surface water (offsite) –** Two 2011 samples (SW001 and SW002) collected within the Laguna Kiani complex lobe where SWMU 6 connects with the Laguna Kiani complex. These offsite stations represent an area for evaluating potential transport of constituents of interest from SWMU 6.
- **Surface sediment (onsite) –** Eight 2011 samples collected from the SWMU 6 lagoon at a depth of 0-6 inches.
- **Surface sediment (offsite) –** Two 2011 samples (SD001 and SD002) collected at a depth of 0-6 inches within the Laguna Kiani complex lobe where SWMU 6 connects with the Laguna Kiani complex. These offsite stations represent an area for evaluating potential transport of constituents of interest from SWMU 6.
- **Surface sediment (PCB removal area) –** Two 2011 confirmation samples (SS012 and SS013) collected at two former debris pile areas along the south side of Highway 200 to verify the effectiveness of recent (February 2011) PCB-contaminated removal actions.

In addition, facility-wide background surface soil data from the West Vieques background study (CH2M HILL, 2002) were used for comparison to the surface soil samples, and site-specific background surface water and sediment samples were used for comparison to site surface water and sediment samples (see Section 1.5).

1.3.3 Exposure Point Concentrations

At the screening level (SERA; Step 2) for direct exposures, the EPC was the maximum detected concentration. At the baseline level (BERA; Step 3A) for direct exposures, the EPC was a central tendency estimate (arithmetic mean and the 95 percent upper confidence limit [UCL] of the arithmetic mean), which provides a more representative estimate of potential exposures and risks to receptor populations (which are the focus of the selected assessment endpoints). These three EPCs were also used in bioaccumulation and food web models to estimate exposures to upper trophic level receptors. Dietary items for which tissue concentrations were modeled included benthic invertebrates and fish.

Incidental ingestion of surface sediment, but not ingestion of drinking water (due to the high salinity of the SWMU 6 lagoon), was included when calculating the total exposure. As discussed in Section 1.2.3.3, terrestrial food web modeling was not conducted for the upland, roadside soil portion of SWMU 6, or the PCB removal areas. The models and parameter values used for calculating these tissue concentrations are outlined in the following subsections.

Not all chemicals were evaluated for food web exposures. Only those chemicals with the potential to bioaccumulate to a significant extent, as defined in Table 4-2 of USEPA (2000), were evaluated. This list of bioaccumulating chemicals is provided in **Table F-7** for chemicals relevant to SWMU 6, and is based upon the list and selection process outlined in the final ERA Protocol (CH2M HILL, 2010a). The list of relevant chemicals for SWMU 6 includes: (1) all sampled chemicals in surface water and sediment on the USEPA (2000) list; and (2) all explosive compounds detected in SWMU 6 surface water and sediment (none were detected).

For the screening (SERA) exposure estimates, the uptake of chemicals from the abiotic media into food items was based upon conservative (e.g., 90th percentile) bioconcentration factors (BCFs) or bioaccumulation factors (BAFs) from the literature, where available. The 90th percentile is generally recommended to provide for a conservative screening assessment (Sample et al., 1998a; 1998b; Bechtel Jacobs, 1998). If 90th percentile values were not available in the cited reference, the maximum value was used, if available. If only central tendency (e.g., median) values were reported, they were used for both the SERA and BERA. Where an individual study (as opposed to a compilation of multiple studies) was cited, the best available value was sometimes a single value or the derivation was not specified. Default (assumed) factors of 1.0 were used only when data were not readily available for a chemical in the literature.

BCFs and BAFs used for baseline (BERA) exposure estimates were based upon, or modeled from, central tendency estimates (e.g., median or mean). Baseline values considered both the distribution of the data (e.g., normal or log normal) and the recommendations in the cited reference. Geometric means were preferred for log normal distributions and arithmetic means for normal distributions. In some cases, neither distribution was applicable or the distribution was biased by an outlying value. In these cases, point estimates like the median were then considered. Where an individual study (as opposed to a compilation of multiple studies) was cited, the best available value was sometimes a single value or the derivation was not specified. Default (assumed) factors of 1.0 were used only when data were not readily available for a chemical in the literature.

In the baseline assessment, using central tendency estimates (rather than high-end values or maximums) for exposure parameters such as BAFs provides a more representative estimate of potential exposures and risks to receptor populations (which are the focus of the selected assessment endpoints) of upper trophic level receptors. Since these upper trophic level species are highly mobile, they would be expected to effectively average their exposure over time as they forage within the area defining their home range. Average prey concentrations are most appropriately estimated using central tendency estimates of media concentrations and accumulation factors. For example, the wildlife dietary exposure models contained in the *Wildlife Exposure Factors Handbook* (USEPA, 1993a) specify the calculation of an average daily dose. Increasing the representativeness of the exposure estimates relative to population-level effects is consistent with the intent of the BERA. In cases where adequate spatial sampling coverage exists, mean concentrations are also appropriate for evaluating potential risks to populations of lower trophic level receptors because the members of the population are expected to be found throughout a site (where suitable habitat is present), rather than concentrated in one particular area. While effects on individual organisms might be important for some receptors, such as rare and endangered species, population- and community-level effects are typically more relevant to ecosystems.

1.3.3.1 Benthic Invertebrates

Tissue concentrations in benthic invertebrates were estimated by multiplying the maximum (SERA) or mean (BERA) sediment concentration for each chemical by chemical-specific sediment-to-invertebrate BAF or biota-sediment accumulation factor (BSAF) values obtained from the literature. BSAF (wet weight) values were converted to BAF values (dry weight) for use in the food web models using the percent lipid and percent solid values listed in **Table F-8**, and the mean measured site-specific TOC from the SWMU 6 samples (1.43 percent). These values, for both the SERA and BERA, are listed in **Table F-8**. For the SERA, the point estimate BAFs in

Table F-8 (screening set) were the preferred values. For the BERA, the algorithms listed in **Table F-9**, if available for a chemical, were the preferred method for deriving BAFs, followed by the point-estimate BAFs in **Table F-8** (baseline set).

The BAF values selected were based upon the ratio between dry-weight sediment and dry-weight invertebrate tissue. BAFs based upon depurated analyses (sediment was purged from the gut of the organism prior to analysis) were given preference over undepurated analyses when selecting BAF values because direct ingestion of sediment is accounted for separately in the food web model. However, in some cases, the depurated data set was limited or highly variable, and the pooled or undepurated data were then considered.

Literature values based upon the ratio between dry-weight sediment and wet-weight invertebrate tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for benthic invertebrates (21 percent [0.21]; USEPA, 1993a). For chemicals without available measured BAFs, a BAF was estimated using available regression equations from the literature, was estimated using data for similar chemicals, or a BAF of 1.0 was assumed.

1.3.3.2 Fish

Tissue concentrations in whole-body fish were estimated by multiplying the maximum (SERA) or mean (BERA) sediment concentration for each chemical by chemical-specific sediment-to-fish BAF or biota-sediment accumulation factor (BSAF) values obtained from the literature. BSAF (wet weight) values were converted to BAF values (dry weight) for use in the food web models using the percent lipid and percent solid values listed in **Table F-10**, and the mean measured site-specific TOC from SWMU 6 samples (1.43 percent). These values, for both the SERA (screening set) and BERA (baseline set), are listed in **Table F-10**.

The BAF values were based upon the ratio between dry-weight sediment and dry-weight fish tissue. Literature values based upon the ratio between dry-weight sediment and wet-weight fish tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for fish (25 percent [0.25]; USEPA, 1993a). For chemicals without literature-based sediment-to-fish BAFs, a BAF was estimated using data for similar chemicals or a BAF of 1.0 was assumed.

1.3.4 Dietary Intakes

Upper trophic level receptor exposures via food webs to chemicals present in surface sediment were determined using estimated chemical concentrations in each relevant dietary component for each upper trophic level receptor, as described in the previous section. Incidental ingestion of surface sediment was also included when calculating the total exposure. Drinking water exposures were not included (were set to zero) due to the high salinity of the SWMU 6 lagoon.

Dietary intakes for each upper trophic level receptor were calculated using the following formula (modified from USEPA [1993a]):

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

where:
- DI_x = Dietary intake for chemical x (mg chemical/kg body weight/day)
- FIR = Food ingestion rate (kg/day, dry-weight)
- FC_{xi} = Concentration of chemical x in food item i (mg/kg, dry-weight)
- PDF_i = Proportion of diet composed of food item i (dry-weight basis)
- SC_x = Concentration of chemical x in sediment (mg/kg, dry-weight)
- PDS = Proportion of diet composed of sediment (dry-weight basis)
- WIR = Water ingestion rate (L/day)
- WC_x = Concentration of chemical x in water (mg/L)
- BW = Body weight (kg)

Incidental ingestion of sediment was modeled as a dietary component rather than using a separate sediment ingestion rate. Water ingestion was set to zero. Parameter values for the selected receptors are listed in **Table F-11** (screening) and **Table F-12** (baseline). When measured food ingestion rates were not available for a receptor from the literature, the rates were estimated using allometric equations from Nagy (2001).

The exposure parameter values were selected to provide for a conservative evaluation at the screening level (Step 2). Examples of these conservative assumptions include:

- All of the dietary items consumed by the receptor are obtained from the site (i.e., an Area Use Factor [AUF] of one was assumed) at the point of maximum concentration.
- Chemicals are 100 percent bioavailable.
- Maximum food ingestion rates were used (calculated maximum ingestion rates using allometric equations were based upon the maximum adult body weight).
- Minimum adult body weights were used. The selection focused on the most geographically appropriate values available from standard literature sources (e.g., USEPA, 1993a).
- Exclusive diets (composed of one primary prey item) were used.

For the baseline (Step 3A) estimates:

- Central tendency estimates (e.g., mean, median, or midpoint) for adult body weight and ingestion rates were used, as were more realistic dietary compositions. Central tendency estimates for these exposure parameters are more relevant for a BERA because they better represent the characteristics of a greater proportion of the individuals in the population. Populations or communities (rather than individual organisms) were emphasized when developing the assessment endpoints for the ERA.
- An AUF of 1.0 was retained in Step 3A.

1.4 Effects Assessment

The purpose of the effects assessment is to establish chemical exposure levels (screening values) that represent conservative thresholds for adverse ecological effects. One set of screening values is developed for each selected assessment endpoint. Based upon the CSM, direct exposure to surface water and sediment, and exposure via aquatic food webs, are the principal complete pathways at the site. Direct exposure to surface soil is also a potentially complete pathway.

The effects assessment defines the methods and data used to define an adverse ecological effect. For this ERA, effects data are available from multiple lines of evidence, as follows:

- **Ecological Screening Values (ESVs) for Surface Water, Surface Sediment, and Surface Soil** - Analytical data are compared to the medium-specific ESVs developed in Section 1.4.1.
- **Toxicity Reference Values (TRVs) for Ingestion Exposures** - Food web exposure estimates are compared to ingestion-based TRVs developed in Section 1.4.2 for upper trophic level receptors.
- **Bioavailability Measures** - Additional data were collected to help evaluate chemical-specific bioavailability in surface soil, surface water, and surface sediment.

In addition, a comparison of site surface soil concentrations to Vieques-wide background concentrations, and a comparison of site surface water and sediment concentrations to site-specific background concentrations, was conducted as an additional line of evidence (see Section 1.5).

1.4.1 Medium-Specific ESVs

Medium-specific ESVs were established for each ecologically relevant medium. Based upon the CSM (**Figure F-4**), direct exposure to surface water, surface sediment, and surface soil are potentially complete pathways. Based upon the salinity of the lagoon, marine ESVs were used, when available; freshwater values were considered when marine values were lacking. For surface water screening, freshwater screening values were used for aluminum,

cobalt, 2-methylnaphthalene, and fluorene because marine screening values were not available and these chemicals were detected in site samples. The ESVs used in the ERA are summarized, by medium, in **Tables F-13 through F-16**.

For surface water, the ESVs for chemicals known to bioaccumulate in aquatic food webs were based upon the final chronic value (rather than the final residue value) as per USEPA (1996a, 2009b) and Suter and Tsao (1996). The use of final chronic values is intended to protect aquatic receptors from direct exposures to chemicals in surface water, rather than from exposure via food webs. Potential risks to upper trophic level receptors from food web exposures (tissue residues) were evaluated separately using the ingestion-based TRVs outlined in Section 1.4.2.

Measures of chemical bioavailability are also considered in this ERA. For surface water, USEPA (1996a) indicates that the dissolved metal fraction should be preferentially used compared to the total metal fraction in surface water evaluations because dissolved metal concentrations best represent the bioavailable fraction. High levels of suspended solids and sediment-adsorbed metals, which could be present in unfiltered samples, could result in overstating bioavailable surface water concentrations and thus potential exposures and risks.

For sediment, simultaneously extracted metals/acid volatile sulfide (SEM/AVS) were analyzed to support the evaluation of biological availability of select metals (cadmium, copper, lead, mercury, nickel, silver, and zinc). SEM is the molar sum of the seven listed metals. AVS is the reactive pool of solid-phase sulfide that is available to bind metals and render them unavailable and nontoxic to biota. When AVS exceeds the sum SEM, that is, the ratio of SEM/AVS is less than one, these reactive metals are assumed to exist entirely in the form of metal sulfides, which have limited bioavailability to benthic organisms.

Equilibrium partitioning (EqP), which incorporates a measure of sediment chemical bioavailability, is appropriate for developing sediment effect levels for non-ionic (non-polar) organic chemicals (USEPA, 1993b; 1996a). EqP theory holds that a non-ionic chemical present in sediment partitions between sediment organic carbon, interstitial (pore) water, and benthic organisms. For these types of chemicals, it has been demonstrated that biological effects are correlated not to the total concentration of a chemical in bulk sediment but to the pore water concentration. Thus, effect levels based on water-only exposures (such as AWQC values) can be used to estimate potential biological effects from sediment exposures when coupled with a measure of the ratio of the concentration in pore water to the concentration in sediment organic carbon (the organic carbon partition coefficient, K_{oc}) using the following formula (USEPA, 1996a; 1999):

$$EqPValue = (f_{oc})(K_{oc})(FCV)$$

where:	EqP Value	=	Equilibrium partitioning-based value (μg/kg)
	f_{oc}	=	Total organic carbon content (percent, as a fraction)
	K_{oc}	=	Normalized adsorption (partition) coefficient (L/kg)
	FCV	=	Chronic AWQC or its equivalent (μg/L)

The sorption capacity of the sediment is determined by the mass fraction of organic carbon present in the sediment (f_{oc} or TOC). For sediments with a f_{oc} of greater than 0.2 percent by weight, the organic carbon appears to be the predominant determinant for chemical sorption. Thus, the amount of organic carbon present in the sediment controls the bioavailability of a non-ionic chemical through sorption. In general, the higher the organic carbon content of the sediment, the lower the bioavailability of the chemical. By using the measured site-specific organic carbon content of a sediment in the above equation, the site-specific bioavailability and toxicity of non-ionic chemicals can be evaluated. Literature based marine sediment EqP values, as documented in the final ERA Protocol (CH2M HILL, 2010a), are provided in Table F-15. For non-ionic organic chemicals analyzed in site sediment but not listed in Table 15, EqP values were calculated using the equation above (**Appendix B**). These EqP values, which are all based on 1 percent TOC, can be adjusted (normalized) to site-specific TOC values as appropriate to derive site-specific ESVs.

1.4.2 Ingestion TRVs

Ingestion TRVs for dietary exposures were derived for each bioaccumulative chemical evaluated in the ERA. TRVs were derived for both mammalian and avian upper trophic level receptors, the only two taxonomic groups for which sufficient toxicological information was generally available for the range of bioaccumulative chemicals evaluated. Toxicological information from the literature for wildlife species most closely related to the receptor species were used, where available, but were supplemented by laboratory studies of non-wildlife species (e.g., laboratory mice) where necessary. The ingestion TRVs are expressed as milligrams of the chemical per kilogram body weight of the receptor per day (mg/kg-BW/day).

Survival, growth, and reproduction were emphasized as toxicological endpoints because they are the most relevant, ecologically, to maintaining viable populations and because they are generally the most studied toxicological endpoints for ecological receptors. Endpoints based upon reproduction were generally preferred to those based upon growth which were preferred to those based upon survival. If several chronic toxicological studies were available from the literature, the most appropriate study was selected for each receptor species based upon study design, study methodology, study duration, study endpoint, and test species.

Ingestion TRVs were derived for both chronic No Observed Adverse Effect Level (NOAEL) and chronic Lowest Observed Effect Level (LOAEL) endpoints. The applicable uncertainty factors from **Table F-17** were used to derive these TRVs where appropriate (uncertainty factors were not generally applied to TRVs obtained from Eco-SSL documents because these TRVs often encompassed multiple studies). Because assessment endpoints were based upon population- or community-level effects, no intraspecies uncertainty factors were applied. Taxonomic class-type uncertainty factors were also not applied because the TRVs selected were typically derived based upon data from a broad range of taxonomic groups. Maximum Acceptable Toxicant Concentrations (MATCs), defined as the geometric mean of the NOAEL and LOAEL, were also calculated.

The final Step 2 food web COPCs were selected based upon a comparison of maximum exposure doses from site-specific food web modeling with the NOAEL-based ingestion TRV. Those chemicals with an exposure dose exceeding the NOAEL-based ingestion TRV were identified as Step 2 COPCs. For Step 3A, ingestion-based (food web) COPCs were based upon a comparison of mean exposure doses with ingestion TRVs based upon the NOAEL, MATC, and LOAEL. An exceedance of the MATC was considered an unacceptable effect at Step 3A, although chemicals that exceed the MATC, but not the LOAEL, were discussed for possible risk management considerations.

Ingestion TRVs for mammals and birds are provided in **Tables F-18 and F-19**, respectively. For some chemicals in **Table F-19**, relevant toxicological information was available for more than one test species that represented different guilds (based upon factors such as dietary composition and trophic level). In these instances, the TRV considered most applicable to the target avian receptor evaluated at the site was used in the food web model. **Table F-19** specifically indicates which test organism TRV was applied to each target avian receptor (green heron or spotted sandpiper) in the exposure dose calculations (see **Attachment C**).

1.4.3 Bioavailability Measures

Data collected to evaluate the potential chemical-specific bioavailability in abiotic media included:

- **Surface soil** - pH.
- **Surface sediment** - TOC, pH, SEM/AVS, and grain size.
- **Surface water** - Dissolved metals.

1.5 Risk Characterization

The risk characterization portion of the ERA uses the information generated during the three previous parts of the ERA (problem formulation, exposure assessment, and effects assessment) to estimate potential risks to ecological receptors at the level of conservatism applied (screening or baseline).

1.5.1 Methodology

The methodology used for the risk characterization, per the final ERA protocol, is described in the following two subsections for the SERA (Step 2) and BERA (Step 3A).

1.5.1.1 SERA Approach

The main objective of risk characterization at the screening level (termed risk calculation) is to derive a list of COPCs. As part of this risk calculation, the maximum exposure concentrations (abiotic media) or maximum exposure doses (upper trophic level receptors) are compared with the corresponding ESVs or TRVs to derive risk estimates using the hazard quotient (HQ) method. HQs are calculated by dividing the chemical concentration in the medium being evaluated by the corresponding medium-specific ESV, or by dividing the exposure dose by the corresponding ingestion-based TRV. HQs equaling or exceeding one indicate the potential for unacceptable risk since the chemical concentration or dose (exposure) equals or exceeds the ESV or TRV (effect); these chemicals are identified as COPCs at Step 2. However, ESVs/TRVs and exposure estimates are derived using intentionally conservative assumptions at the screening level such that HQs greater than or equal to one do not necessarily indicate that unacceptable risks are present. Rather, it identifies chemical-pathway-receptor combinations requiring further evaluation using more realistic exposure scenarios and assumptions. Following the same reasoning, HQs less than one indicate that unacceptable risks are unlikely, enabling a conclusion of negligible (acceptable) risk to be reached with high confidence.

In addition to chemicals that exceeded medium-specific ESVs based upon maximum detected concentrations, or that exceeded TRVs based upon maximum ingestion doses, the following also applied to COPC selection at Step 2:

- Non-detected chemicals were retained as COPCs if the maximum detection limit exceeded the ESV for that medium or if the ingestion dose calculated using the maximum detection limit exceeded the TRV.
- All detected chemicals lacking a TRV and/or ESV were retained as COPCs.
- The essential nutrients calcium, magnesium, potassium, and sodium were excluded as potential COPCs since they are essential macronutrients that are needed in relatively high concentrations for normal metabolism, growth, and reproduction.

1.5.1.2 BERA Approach

COPCs from the SERA are reevaluated in the first step of the BERA (Step 3A). As discussed previously, this reevaluation involves using more realistic assumptions about exposures and a comparison of these revised exposure estimates (based upon central tendency estimates of media concentrations, BAFs, and exposure parameters) with ESVs and TRVs.

In addition to chemicals that exceeded medium-specific ESVs based upon mean detected concentrations, or that exceeded TRVs based upon mean ingestion doses, the following also applied to COPC selection at Step 3A:

- All detected chemicals lacking a TRV and/or ESV were retained as COPCs for risk evaluation.
- Ingestion-based (food web) COPCs were based upon a comparison of mean and 95% UCL exposure doses with ingestion TRVs based upon the NOAEL, MATC, and LOAEL. An exceedance of the MATC was generally considered an unacceptable effect at Step 3A, although chemicals that exceed the MATC, but not the LOAEL, were discussed for possible risk management considerations.

For Step 3A, the following additional factors were also considered, as appropriate:

- **Frequency of Detection.** Chemicals that were detected in less than five percent of the samples in a medium were generally eliminated as COPCs in that medium if at least 20 samples are available (USEPA, 1989). It is unlikely that infrequently detected chemicals represent an unacceptable risk to receptors at the population level, due to limited spatial exposure. However, a qualitative evaluation was conducted to insure that “hot spot” areas were not eliminated from consideration based upon this screening criterion before a chemical was eliminated from further consideration.

- **Vieques-Wide Background Concentrations.** Vieques-wide background concentrations from the West Vieques background study (CH2M HILL, 2002) were also considered in the reevaluation for surface soil. The background evaluation consisted of a direct comparison of site surface soil concentrations to the upper tolerance limits (UTLs) developed for inorganics in the background study, or that have been developed for pesticides as part of various site-specific evaluations (CH2M HILL, 2009a; 2009b) using available facility-wide surface soil data (**Table F-20**), in a manner analogous to the comparison to ESVs. SWMU 6 falls within soil type Qs so UTLs based upon this soil type were used in the ERA.

  Similarly, 95% UTL values calculated from 10 background surface water (**Table F-21**) and sediment (**Table F-22**) samples (CH2M HILL, 2011b) collected from three lagoons near SWMU 6 were compared with concentrations from samples collected in the SWMU 6 lagoon and in the Laguna Kiani complex lobe.

1.5.2 Aquatic Habitats – SWMU 6 Lagoon

Surface water and sediment samples associated with the SWMU 6 lagoon are compared with ESVs and background UTLs, and sediment samples are used to calculate food web exposures.

1.5.2.1 Comparison With Surface Water ESVs

Maximum, mean, and 95% UCL surface water concentrations associated with the SWMU 6 lagoon are compared with marine surface water ESVs in **Table F-23**. **Table F-23** also contains a comparison against background UTLs for constituents that exceeded surface water ESVs in at least one sample.

SERA (Step 2)

Maximum surface water concentrations are compared to ESVs in **Table F-23**. Based upon this comparison for unfiltered samples, three metals (cadmium, iron, and thallium) had HQs exceeding one based upon maximum detected concentrations. Cadmium and thallium were not detected in filtered (dissolved) samples. The maximum dissolved iron concentration also exceeded its ESV. Though total aluminum data were rejected in all site samples and were therefore not evaluated, the maximum dissolved aluminum concentration exceeded its ESV. Thus, aluminum, cadmium, iron, and thallium were identified as Step 2 COPCs.

Nine metals and nine pesticides were not detected but maximum detection limits exceeded ESVs. These 16 constituents were also identified as Step 2 COPCs.

BERA (Step 3A)

Mean surface water concentrations are compared to ESVs and UTLs in Table F-23. Based upon this comparison for unfiltered samples, two metals (cadmium and thallium), each of which was detected in one of the five samples, had HQs exceeding one based upon mean detected (total metal) concentrations and also exceeded background UTLs. Neither of these metals was detected in filtered (dissolved metal) samples, although detection limits for all samples exceeded ESVs for both metals. Although the project quantitation limits for cadmium and thallium (1 and 10 µg/L, respectively) were well below the ESVs, media interferences (primarily sodium from the saltwater media) required samples to be diluted (20 X) before internal standards could be met, resulting in sample detection limits above ESVs. Uncertainty regarding marine surface water interference with metal detection limits is discussed further in Section 1.6 (Uncertainties). Considering the single detections of total cadmium and thallium in five unfiltered samples near the detection limits, the lack of detection of these metals in the dissolved phase, and with consideration of the uncertainties associated with detection limits above the ESVs as a result of media interference, cadmium and thallium were not retained as COPCs. Aluminum and iron exceeded ESVs in filtered samples based upon mean detected concentrations and aluminum also exceeded background UTLs; there were insufficient data to calculate a background UT for dissolved iron. Thus, aluminum and iron were identified as COPCs for further risk evaluation.

Eight metals and one pesticide were not detected but mean detection limits exceeded ESVs and also exceeded UTLs, where available. These constituents were not identified as COPCs for further risk evaluation but are discussed in the uncertainty section (Section 1.6).

1.5.2.2 Evaluation of Sediment Data Collected in 2009

This ERA quantitatively evaluates only the data collected during the most recent sediment sampling event (February 2011). This is based upon a review of the sediment data collected during the post-removal sampling event in 2009 (13 samples), as compared with the data from the post-removal supplemental confirmatory sampling event conducted in February 2011 (10 samples) combined with the 2009 data (23 total samples), which resulted in the following:

- **Volatile Organic Compounds (VOCs)** - Six VOCs were detected during one or both sampling events. Tetrachloroethene was the only one of these VOCs to have a screening value, a comparison to which resulted in a HQ of less than one. The maximum detected concentrations of four of these VOCs occurred in 2011. Methylene chloride and styrene were detected in one of 13 samples in 2009; however, the 2009 field sampling method for VOCs was considered unreliable.
- **Semivolatile Organic Compounds (SVOCs)** – Fifteen SVOCs were detected during one or both sampling events. The maximum detected concentrations of 14 of these were less than their ESVs. Dibenz(a,h)anthracene was detected in one 2009 sample at a maximum HQ of 1.04; the mean HQ was less than one**.** Dibenz(a,h)anthracene was not detected in 2011 samples.
- **Pesticides/PCBs** – Five pesticides and one PCB Aroclor were detected during one or both sampling events. Alpha-chlordane and gamma-chlordane were not detected in 2011, but were detected in a single sample in 2009 with maximum and mean HQs above one (both 1.8) in the combined data sets. 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected during both sampling events, with average concentrations higher for the combined 2009/2011 data set compared to 2011 alone. However, only 4,4'-DDD had a mean EqP-based HQ above one (1.1) for the combined set (0.79 for 2011 only). Aroclor-1254 was detected during both sampling events, but the mean EqP-based HQ was less than one for both the combined 2009/2011 data set and for the 2011 data set alone.
- **Inorganics** – Nineteen metals (excluding essential nutrients) were detected during one or both sampling events. Metals with mean concentrations that resulted in HQs above one, for either the combined 2009/2011 data set or for 2011 alone, included antimony, cadmium, copper, lead, selenium, and zinc. Five of these metals had mean HQs above one in both data sets, though the difference between the mean HQs was low, ranging from 0.2 to 0.9. Selenium was not detected in 2011 samples; the mean HQ was 2.2 for the combined 2009/2011 data set.

The results of this evaluation provide a strong indication that, for this ERA, using the most current sediment data set (February 2011) from SWMU 6 is appropriate. Combining 2009 post-removal data with the 2011 post-removal supplemental confirmatory data resulted in little or no differences in HQs and resulting COPCs. In addition, samples collected in 2011 were well distributed throughout the approximately 0.5 acre aquatic portion of the site, were located in close proximity to stations sampled in 2009, and, considering the highly disturbed conditions immediately following 2009 removal activities (when the 2009 samples were collected), the 2011 data reflect a more stabilized ecosystem. However, since physical sediment parameters, including grain size, AVS/SEM, pH, and TOC, were not collected in 2009, a comparison between the two sampling events is not possible (these parameters were also not measured in pre-removal samples since most of the site was terrestrial [soils] prior to the removal action). However, when compared with the two samples collected in 2011 from the Laguna Kiani complex lobe just outside of the SWMU 6 lagoon (which were not impacted by the removal action), 2011 sediment samples in the SWMU 6 lagoon had lower concentrations of TOC, slightly higher values for pH, reduced levels of sulfides (resulting in higher SEM/AVS ratios), and generally lower percentages of fines (silt/clay). It is likely that these differences are related to the removal action and suggest that the SWMU 6 lagoon has not yet reached post-removal equilibrium.

1.5.2.3 Comparison With Sediment ESVs

Maximum, mean, and 95% UCL sediment concentrations associated with the SWMU 6 lagoon are compared with marine sediment ESVs in **Table F-24**. **Table F-24** also contains a comparison against background UTLs for constituents that exceeded sediment ESVs in at least one sample.

SERA (Step 2)

Maximum sediment concentrations are compared to ESVs in **Table F-24**. Based upon this comparison, seven metals (antimony, cadmium, copper, lead, manganese, vanadium, and zinc), three pesticides (4,4'-DDD, 4,4'-DDE, and 4,4'-DDT), and one PCB Aroclor (1254) had HQs exceeding one based upon maximum detected concentrations and were identified as Step 2 COPCs. Two metals (thallium and hexavalent chromium) and three VOCs (acetone, 2-butanone, and carbon disulfide) were detected but an ESV was not available. These five chemicals were also identified as Step 2 COPCs.

One metal (selenium), 10 pesticides, five PCB Aroclors, and two VOCs were not detected but maximum detection limits exceeded ESVs. These 18 chemicals were also identified as Step 2 COPCs.

BERA (Step 3A)

Mean sediment concentrations are compared to ESVs and UTLs in **Table F-24**. Based upon this comparison, four metals (cadmium, copper, lead, and zinc), three pesticides (4,4'-DDD, 4,4'-DDE, and 4,4'-DDT), and one PCB Aroclor (1254) had HQs exceeding one based upon mean detected concentrations, and exceeded UTLs (where available), and were identified as Step 3A COPCs. Two metals (thallium and hexavalent chromium) and three VOCs (acetone, 2-butanone, and carbon disulfide) were detected but an ESV was not available. However, concentrations of hexavalent chromium were less than background UTLs. Thus, thallium, acetone, 2-butanone, and carbon disulfide were also identified as Step 3A COPCs. Nine pesticides were not detected but mean detection limits exceeded ESVs and also exceeded UTLs, where available. These nine pesticides were also identified as Step 3A COPCs.

Step 3A COPCs were reevaluated based upon bioavailability considerations (SEM/AVS and EqP). Four of the five metal Step 3A COPCs (cadmium, copper, lead, and zinc) were AVS metals. Seven of the eight SEM/AVS ratios measured in the SWMU 6 lagoon exceeded one, suggesting that these metals are currently bioavailable. Thus, cadmium, copper, lead, zinc, and thallium were identified as COPCs for further risk evaluation (**Table F-25**).

Organic COPCs are compared with EqP-based ESVs in **Table F-25**. HQs based upon mean concentrations did not exceed one for any of these constituents. 2-Butanone and carbon disulfide did not have EqP-based ESVs and were identified as COPCs for further risk evaluation.

1.5.2.4 Food Web Exposures

Food web exposures are evaluated for the SWMU 6 lagoon based upon surface sediment concentrations. Due to the salinity of the lagoon, surface water samples are not considered as drinking water. There was also one exceedance (for Aroclor-1254) for the fishing bat.

SERA (Step 2)

HQs based upon maximum exposure doses for each upper trophic level aquatic receptor are listed in **Table F-26** (calculations are shown in **Attachment C**). Based upon a comparison to NOAELs, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, the seven PCB Aroclors, 4,4'-DDD, 4,4'-DDE, dieldrin, and toxaphene had HQs exceeding one for one or more receptors. The exceedances for selenium, Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1260, dieldrin, and toxaphene were based upon maximum reporting limits. An ingestion TRV for avian receptors was not available for 1,1,2,2-tetrachloroethane; this chemical was not detected in sediment.

BERA (Step 3A)

HQs based upon 95% UCL exposure doses for each upper trophic level aquatic receptor are listed in **Table F-27** (calculations are shown in **Attachment C**). Based upon a comparison to NOAELs, copper, lead, mercury, selenium, and Aroclor-1254 had HQs exceeding one for at least one receptor. The exceedances for selenium were based upon reporting limits. There was one exceedance (for copper) based upon the LOAEL and two exceedances (for copper and lead) based upon the MATC, all for the spotted sandpiper.

HQs based upon mean exposure doses for each upper trophic level aquatic receptor are listed in **Table F-28** (calculations are shown in **Attachment C**). Copper and lead had HQs that exceeded one based upon the MATC (for

the spotted sandpiper), the defined threshold for a potential adverse effect in the final ERA protocol, although the HQ based upon the LOAEL was less than one for lead. Thus, copper and lead were identified as COPCs for aquatic food web exposures in the SWMU 6 lagoon.

1.5.3 Aquatic Habitats – Offsite Laguna Kiani Complex Lobe Samples

Surface water and sediment samples from the offsite Laguna Kiani complex lobe samples are compared with ESVs and background UTLs. Due to the small size of this area, food web exposures are not evaluated.

1.5.3.1 Comparison With Surface Water ESVs

Maximum, mean, and 95% UCL surface water concentrations associated with the offsite Laguna Kiani complex lobe samples are compared to marine surface water ESVs in **Table F-29**. **Table F-29** also contains a comparison against background UTLs for constituents that exceeded surface water ESVs in at least one sample.

SERA (Step 2)

Maximum surface water concentrations are compared to ESVs in **Table F-29**. Based upon this comparison for unfiltered samples, six metals (aluminum, cadmium, copper, iron, lead, and selenium) had HQs exceeding one based upon maximum detected concentrations. Of these six constituents, only iron and selenium were detected in filtered (dissolved) samples, and the maximum dissolved iron concentration also exceeded its ESV. Thus, aluminum, cadmium, copper, iron, lead, and selenium were identified as Step 2 COPCs. No organic constituent was detected at concentrations that exceeded ESVs.

Eight metals and nine pesticides were not detected but maximum detection limits exceeded ESVs. These 17 constituents were also identified as Step 2 COPCs.

BERA (Step 3A)

Mean surface water concentrations are compared to ESVs and UTLs in Table F-29. Based upon this comparison for unfiltered samples, two metals (aluminum and lead) had HQs exceeding one based upon mean detected (total metal) concentrations and also exceeded background UTLs (where available), although the maximum ratio to background for aluminum was just above one (1.04). Neither of these metals was detected in filtered (dissolved metal) samples; although mean detection limits exceeded ESVs for both metals, the mean detection limit for aluminum did not exceed the background UTL and only slightly exceeded the background UTL for lead. The project quantitation limits for aluminum and lead (100 and 1 µg/L, respectively) could not be met because media interferences (primarily sodium from the saltwater media) required samples to be diluted (10 X) before internal standards could be met. Uncertainty regarding marine surface water interference with metal detection limits is discussed further in Section 1.6 (Uncertainties). Considering the lack of detection of these metals in the dissolved phase, and with consideration of the uncertainties associated with detection limits above the ESVs as a result of media interference, aluminum and lead were not retained as COPCs. Iron exceeded ESVs in filtered samples based upon mean detected concentrations; there were insufficient data to calculate a background UTL for dissolved iron. Thus, iron was identified as a COPC for further risk evaluation.

Five metals and one pesticide were not detected but mean detection limits exceeded ESVs and also exceeded UTLs, where available. These constituents were not identified as COPCs for further risk evaluation but are discussed in the uncertainty section (Section 1.6).

1.5.3.2 Comparison With Sediment ESVs

Maximum, mean, and 95% UCL sediment concentrations associated with the offsite Laguna Kiani complex lobe samples are compared to marine sediment ESVs in **Table F-30**. **Table F-30** also contains a comparison against background UTLs for constituents that exceeded sediment ESVs in at least one sample.

SERA (Step 2)

Maximum sediment concentrations are compared to ESVs in **Table F-30**. Based upon this comparison, only copper and 4,4'-DDD had HQs exceeding one based upon maximum detected concentrations and were identified as Step 2 COPCs. Three metals (beryllium, thallium, and hexavalent chromium) and three VOCs (acetone, 2-butanone, and

carbon disulfide) were detected but an ESV was not available. These six chemicals were also identified as Step 2 COPCs.

One metal (selenium), 11 pesticides, five PCB Aroclors, four PAHs, and three VOCs were not detected but maximum detection limits exceeded ESVs. These 24 chemicals were also identified as Step 2 COPCs.

BERA (Step 3A)

Mean sediment concentrations are compared to ESVs and UTLs in **Table F-30**. Based upon this comparison, only 4,4'-DDD had a HQ exceeding one based upon mean detected concentrations, and exceeded UTLs (where available), and was identified as a Step 3A COPC. Three metals (beryllium, thallium, and hexavalent chromium) and three VOCs (acetone, 2-butanone, and carbon disulfide) were detected but an ESV was not available. However, concentrations of beryllium, thallium, and hexavalent chromium were less than background UTLs. Thus, acetone, 2-butanone, and carbon disulfide were also identified as Step 3A COPCs. Nine pesticides and two PAHs were not detected but mean detection limits exceeded ESVs and also exceeded UTLs, where available. These 11 constituents were also identified as Step 3A COPCs.

Step 3A COPCs were reevaluated based upon bioavailability considerations. There were no metal Step 3A COPCs so SEM/AVS ratios are not relevant. Organic COPCs are compared with EqP-based ESVs in **Table F-31**. HQs based upon mean concentrations did not exceed one for any of these constituents. 2-Butanone and carbon disulfide did not have EqP-based ESVs and were identified as COPCs for further risk evaluation.

1.5.4 Aquatic Habitats – PCB Removal Areas

Surface sediment samples from the two PCB removal areas on the south side of Highway 200 are compared with ESVs. Due to the small size of this area, food web exposures are not evaluated (see Section 1.2.3.3).

1.5.4.1 Comparison With Sediment ESVs

Maximum, mean, and 95% UCL sediment concentrations associated with the PCB removal areas are compared to marine sediment ESVs in **Table F-32**.

SERA (Step 2)

Maximum sediment concentrations of the PCB Aroclors (the only constituents analyzed for) are compared to sediment ESVs in **Table F-32**. Based upon this comparison, Aroclor-1254 (the only PCB Aroclor detected) had a HQ exceeding one based upon maximum detected concentrations. Thus, Aroclor-1254 was identified as a Step 2 COPC.

BERA (Step 3A)

Mean sediment concentrations of the PCB Aroclors are compared to sediment ESVs in **Table F-32**. Based upon this comparison, none of the PCB Aroclors had a HQ exceeding one based upon mean detected concentrations. Thus, no COPCs were identified and ecological risks are acceptable in this area of the site.

1.5.5 Terrestrial Habitats – SWMU 6 Surface Soil

Surface soil samples from the remaining terrestrial portions of the site are compared with ESVs. Due to the small size of this area, food web exposures are not evaluated (see Section 1.2.3.3).

1.5.5.1 Comparison with Soil ESVs

Maximum, mean, and 95% UCL surface soil concentrations are compared to soil ESVs for plants and soil invertebrates in **Table F-33**. **Table F-33** also contains a comparison against background UTLs for metals and pesticides that exceeded soil ESVs in at least one sample.

SERA (Step 2)

Maximum surface soil concentrations are compared to ESVs in **Table F-33**. Based upon this comparison, four metals (cobalt, copper, manganese, and hexavalent chromium) had HQs exceeding one based upon maximum detected concentrations and were identified as Step 2 COPCs. Iron was also identified as a Step 2 COPC because at least one sample exceeded the pH range on which the ESV was based. Acetone and total petroleum hydrocarbons

(TPH) were detected but soil ESVs were not available. These two constituents were also identified as Step 2 COPCs.

Two metals (selenium and thallium), three pesticides (endrin, endrin aldehyde, and endrin ketone) and one SVOC (4-nitrophenol) were not detected but maximum detection limits exceeded ESVs. These six chemicals were also identified as Step 2 COPCs.

BERA (Step 3A)

Mean surface soil concentrations are compared to ESVs and background UTLs in **Table F-33**. Based upon this comparison, manganese and hexavalent chromium had HQs exceeding one based upon mean detected concentrations, and exceeded UTLs (where available), and were identified as COPCs for further risk evaluation. Iron was also identified as a COPC for further risk evaluation because it exceeded the pH range on which the ESV was based and also exceeded its UTL. Acetone and TPH were detected but a soil ESV was not available. These two constituents were also identified as COPCs for further risk evaluation.

Two metals (selenium and thallium) and one SVOC (4-nitrophenol) were not detected but mean detection limits exceeded ESVs and also exceeded UTLs, where available. These constituents were not identified as COPCs for further risk evaluation but are discussed in the uncertainty section (Section 1.6).

1.5.6 Risk Evaluation

In this section, the various lines of evidence discussed in the previous section are integrated in order to evaluate the potential for unacceptable risks.

1.5.6.1 Aquatic Habitats

Aquatic habitats evaluated included the SWMU 6 lagoon, the Laguna Kiani complex lobe, and the PCB removal areas.

SWMU 6 Lagoon

Six assessment endpoints were developed for the SWMU 6 lagoon (**Table F-6**). Lines of evidence for the lagoon included: (1) comparison of surface water and surface sediment concentrations with ESVs; (2) comparison of site surface water and surface sediment concentrations with background concentrations; and (3) comparison of modeled dietary doses with ingestion TRVs.

Surface Water. In surface water, two metals (aluminum and iron) were identified as Step 3A COPCs in the SWMU 6 lagoon (Section 1.5.2). Neither of these metals was a Step 2 COPC in lagoon sediment, and both are likely to be within the range of background in surface soil. Thus, neither chemical has a likely anthropogenic source. No marine ESV was available for aluminum so a freshwater ESV was used; this freshwater value is influenced by pH and may overestimate potential risks in marine waters (which tend to have higher pH values than freshwater). The total iron concentrations in surface water were consistent with background. Also, the marine ESV for iron in the final ERA protocol (50 µg/L) was from a secondary source (Buchman, 2008). Consulting the primary source cited in Buchman (2008), British Columbia Ambient Aquatic Life Guidelines, indicated that the current document (March 2008) concludes that there are insufficient data to develop a marine-based value for iron. The freshwater value for dissolved iron (350 µg/L) from this reference is higher than the maximum detected concentration in the lagoon (293 µg/L). Based upon this evaluation, no COCs were identified in lagoon surface water.

Sediment. Five metals (cadmium, copper, lead, thallium, and zinc) and two VOCs (2-butanone and carbon disulfide) were identified as Step 3A COPCs in sediment (Section 1.5.2). Copper, lead, and zinc (but not cadmium) were pre-removal COPCs at SWMU 6. The maximum HQs for cadmium and copper were 4.74 and 6.00, respectively, and the mean HQs were 1.93 and 2.27, respectively, based upon the ER-L. Neither metal exceeded the ER-M (9.80 mg/kg for cadmium and 270 mg/kg for copper). The maximum HQs for lead and zinc were 13.1 and 5.66, respectively, and the mean HQs were 4.39 and 1.83, respectively, based upon the ER-L. Both metals exceeded the ER-M (218 mg/kg for lead and 410 mg/kg for zinc) in at least one sample, at maximum ratios of 2.81 for lead and 2.07 for zinc. Cadmium, copper, lead, and zinc are all AVS metals. Seven of the eight SEM/AVS ratios measured in the SWMU 6 lagoon (**Table F-2**) exceeded one, suggesting that these metals are currently

bioavailable. Thus, these metals, particularly lead and zinc, may potentially impact lower trophic level receptors in the lagoon. When compared with the two samples collected in 2011 from the Laguna Kiani complex lobe just outside of the SWMU 6 lagoon (which were not impacted by the removal action), 2011 sediment samples in the SWMU 6 lagoon had lower concentrations of TOC, slightly higher values for pH, reduced levels of sulfides (resulting in higher SEM/AVS ratios), and generally lower percentages of fines (silt/clay). It is likely that these differences are related to the removal action and suggest that the SWMU 6 lagoon has not yet reached post-removal equilibrium.

Thallium was detected in only 1 of 8 samples, with the one detection occurring at about three times the background concentration (there was no ESV for this metal). While there is no known anthropogenic source of this metal on the site, thallium was also a pre-removal COPC on the site. However, the low frequency of detection for this metal suggests that it is unlikely to contribute significantly to ecological risks in the SWMU 6 lagoon. Thus, thallium is not considered a COC.

2-Butanone and carbon disulfide were identified as Step 3A COPCs because they were detected but ESVs, background UTLs, and marine sediment EqP values were not available. However, freshwater EqP values for these VOCs are available in the literature (Jones et al., 1997) and have been included in Table F-25. The maximum detected concentration of 2-butanone (47.3 µg/kg) was less than the site-specific TOC-adjusted freshwater EqP value (386 µg/kg), and therefore does not warrant being considered as a COC. The maximum detected concentration of carbon disulfide (13.0 µg/kg), as well as the 95% UCL (6.2 µg/kg) and arithmetic mean (3.5 µg/kg), were greater than the EqP value (1.22 µg/kg); the arithmetic mean HQ equals 2.9. Carbon disulfide was detected in 3 of 8 site sediment samples. The SWMU 6 site was used during the 1960s and 1970s for the disposal of general solid waste which included empty containers of lubricants, oil, solvents, and paints; broken glass; and rubble. Though it is possible that limited amounts of carbon disulfide could have been discarded with the debris, other factors such as its high volatility, age of the site (over 30 years), low affinity for sorption to organic substances (log Koc = 1.79) such that it is unlikely to partition to or remain in sediment, and an estimated half-life in sediment of 7.4 months (Abrams et. al., 1975), provide evidence that site-related carbon disulfide is unlikely present. Carbon disulfide is known to be produced naturally by sediment microorganisms in wetlands. Prior to the removal action, SWMU 6 was predominately an estuarine, intertidal, forested wetland dominated by black mangrove, and under current, post-removal conditions has remained a marine wetland habitat, with a shallow open water lagoon surrounded by mature mangroves and supporting rapidly growing mangrove seedlings. It is therefore reasonable to expect naturally produced, low levels of carbon disulfide in site sediment. For these reasons, carbon disulfide was not considered to be a COC.Based upon this evaluation, cadmium, copper, lead, and zinc were identified as COCs in the SWMU 6 lagoon sediment.

Food Web. Both copper and lead had HQs that exceeded one based upon the MATC, the threshold for a potential adverse effect. The HQ based upon the LOAEL also exceeded one for copper. The MATC-based HQ for copper (spotted sandpiper) was low (1.87) and the LOAEL-based HQ was only slightly above one (1.08). For lead, the MATC-based HQ (also for the spotted sandpiper) was just slightly above one (1.04) and the LOAEL-based HQ was less than one (0.47). Typically, the SWMU 6 lagoon contains about 0.4 acre of open water, along with about 0.1 acre of intertidal mudflat. Spotted sandpiper foraging at the site would generally be limited to the mudflat habitat. The home range for the spotted sandpiper is variable and larger than found at SWMU 6, reported as a mean of about 0.6 acres (Maxson and Oring, 1980) and 12 acres (Miller and Miller, 1948), and as 2.5, 4.5 and 8.0 acres for individually tracked birds (Hays, 1972). The spotted sandpiper is an indicator species representative of the avian invertivore foraging guild within the project area that includes other shorebird species such as the least sandpiper, semipalmated plover, black-necked stilt, and black-bellied plover, all of which may forage along the intertidal habitat and/or within the shallow water fringe of the lagoon. Although an AUF of one was assumed in the ERA, the available habitat within the site boundary would not provide sufficient forage for this receptor. Thus, its potential exposure at the site is unlikely to result in unacceptable risks given the magnitude of the risk estimates (assuming an AUF of one). For this reason, neither copper nor lead are considered COCs for aquatic food web exposures at the site.

In addition, mean concentrations of the metals (lead and zinc) and PCBs detected in blue crab and fish (mullet and snook) tissue samples collected for evaluation of potential human exposures were entered into the aquatic food web models (see **Appendix F, Attachment D**). Food web receptors included the spotted sandpiper, green heron, and fishing bat, all of which normally consume small prey items such as polychaetes, fiddler crabs, and small fish (< 3 inches). The analyzed organisms, which included whole body crabs (average 4 inch carapace width) and whole body (gutted) fish (average 11 inches total length), do not represent typical prey items for these wildlife receptors primarily because of their large sizes. Considering this uncertainty, site specific tissue data can be more representative of actual exposure relative to modeled dietary concentrations. The same aquatic food web models used in the ERA (**Appendix F**) were used for this tissue evaluation except that mean blue crab concentrations were substituted for modeled mean benthic invertebrate concentrations and mean fish concentrations (both species combined) were substituted for modeled fish concentrations.

Results of the food web models indicated only lead had an MATC-based HQ that exceeded one (HQ = 1.03) for the spotted sandpiper, the defined threshold for a potential adverse effect in the final ERA protocol, although the HQ based upon the LOAEL was less than one for lead. For the spotted sandpiper, lead exposure at the site is unlikely to result in unacceptable risk given the low magnitude of the risk estimate. For the green heron, HQs based on NOAEL, MATC, and LOAEL TRVs were all less than one. The fishing bat had a NOAEL-based HQ of 1.9 for dioxin-like PCBs (TEQ), but MATC and LOAEL-based HQs were less than one; HQs for all other parameters were less than one. This additional evaluation of tissue data collected to support potential HHRA exposure scenarios did not result in any changes to the above conclusions of the ERA.

Laguna Kiani Complex Lobe

Two assessment endpoints were developed for lower trophic level receptors in the Laguna Kiani complex lobe area (**Table F-6**). Lines of evidence included: (1) comparison of surface water and surface sediment concentrations with ESVs; and (2) comparison of site surface water and surface sediment concentrations with background concentrations.

Surface Water. In surface water, iron was identified as a Step 3A COPC in the lobe area (Section 1.5.3). Iron was not a Step 2 COPC in lobe sediment. The total iron concentrations in surface water were consistent with background. Also, the marine ESV for iron in the final ERA protocol (50 µg/L) was from a secondary source (Buchman, 2008). Consulting the primary source cited in Buchman (2008), British Columbia Ambient Aquatic Life Guidelines, indicated that the current document (March 2008) concludes that there are insufficient data to develop a marine-based value for iron. The freshwater value for dissolved iron (350 µg/L) from this reference is higher than the maximum detected concentration in the lobe (318 µg/L). Based upon this evaluation, no COCs were identified in lobe surface water.

Sediment. Two VOCs (2-butanone and carbon disulfide) were identified as Step 3A COPCs in lobe sediment (Section 1.5.3) because they were detected but ESVs and background UTLs were not available. The maximum detected concentration of 2-butanone (30.5 µg/kg) was less than TOC-adjusted freshwater EqP values (524 µg/kg; Jones et al., 1997). Carbon disulfide, which can be naturally produced in wetlands, exceeded a comparable EqP value (1.65 µg/kg; Jones et al., 1997) but has no known site source. For these reasons, neither of these VOCs was considered a COC. Based upon this evaluation, no COCs were identified in lobe sediment.

PCB Removal Areas

Two assessment endpoints were developed for lower trophic level receptors in the PCB removal areas (**Table F-6**). Lines of evidence included a comparison of surface sediment concentrations with sediment ESVs. Only PCB Aroclors were evaluated.

None of the mean HQs for the PCB Aroclors exceeded one (Section 1.5.4). Thus, no COCs were identified for the PCB removal areas and ecological risks are considered acceptable.

1.5.6.2 Terrestrial Habitats

Three assessment endpoints were developed for terrestrial habitats at SWMU 6 (**Table F-6**). Lines of evidence for terrestrial habitats included: (1) comparison of site surface soil concentrations with ESVs; and (2) comparison of site surface soil concentrations with background concentrations.

Three metals (manganese, iron, and hexavalent chromium) were identified as Step 3A COPCs in surface soil (Section 1.5.5). Manganese was detected in both site surface soil samples, but occurred above background in only 1 of the 2 site samples at a ratio of 2.53. However, the background UTL for soil type Qs (360 mg/kg) was low relative to all of the other soil types (1,200 mg/kg; **Table F-20**). All site surface soil concentrations for manganese were less than 1,200 mg/kg, suggesting that they are within the range of background. Similarly, for iron, the background UTL for soil type Qs (18,000 mg/kg) was low relative to all of the other soil types (up to 39,000 mg/kg; **Table F-20**). All site surface soil concentrations for iron were less than 39,000 mg/kg, suggesting that they are within the range of background. Thus, neither manganese nor iron were identified as COCs.

Total chromium concentrations (maximum of 24.6 mg/kg, in the one surface soil sample from 2009) were well below soil ESVs (64.0 mg/kg) and background UTLs (48.0 mg/kg). Concentrations of total chromium in the one 2011 sample (6.60 mg/kg) were even lower. Hexavalent chromium was measured in the 2011 sample (2.38 mg/kg), but not in the 2009 sample, and comprised about one-third of the total chromium. Hexavalent chromium was not measured in background soil samples. However, concentrations of up to 150 mg/kg were measured in background sediment samples and hexavalent chromium typically exceeded total chromium concentrations in these background sediment samples, by more than an order of magnitude in some instances. This suggests that the analytical method used overestimated the hexavalent fraction. Since the HQ for hexavalent chromium in site surface soil samples was approximately six, and the overestimation is likely to be by a larger factor, hexavalent chromium is not likely to be present in site surface soil at levels that exceed ESVs and/or background. Thus, hexavalent chromium was not identified as a COC.

Acetone and TPH (diesel range) were detected in site surface soil samples but could not be evaluated quantitatively because ESVs were not available. However, the maximum concentration of acetone (4.60 µg/kg) was less than ESVs for the other 35 VOCs with available ESVs (which ranged from 6.80 to 64,000 µg/kg, with a median of 1,280 µg/kg and an average of 5,819 µg/kg; see **Table F-16**). Thus, acetone was not identified as a COC. There are no available soil ESVs for TPH. However, PAHs (which are typically the most toxic fraction of the TPH) did not exceed ESVs in surface soil samples. Thus, TPH was not identified as a COC.

1.5.7 Risk Summary and Conclusions

Based upon this evaluation, cadmium, copper, lead, and zinc were identified as COCs in SWMU 6 lagoon sediment for direct exposures to lower trophic level receptors. No COCs were identified for surface soil, surface water, surface sediment in the Laguna Kiani complex lobe area, or surface sediment in the PCB removal areas at SWMU 6. Similarly, no COCs were identified for aquatic food web exposures. Thus, with the exception of potential risk to benthic organisms exposed to certain metals (cadmium, copper, lead, and zinc) in SWMU 6 sediment, risks to all other ecological receptors are considered acceptable under current site conditions for these areas, media, and exposure pathways.

1.6 Uncertainties

Uncertainties are present in all risk assessments because of the limitations of the available data and the need to make certain assumptions and extrapolations based on incomplete information. In addition, the use of various models (e.g., uptake and food web exposures) carries with it some associated uncertainty as to how well the model reflects actual conditions. Since conservative assumptions were generally used in the exposure and effects assessments, these uncertainties are more likely to result in an overestimation rather than an underestimation of the likelihood and magnitude of risks to ecological receptors. The uncertainties in this ERA are mainly attributable to the following factors:

- Reporting Limits – Reporting limits for some undetected analytes exceeded applicable ESVs in some media. **Table F-34** summarize these constituents, by medium, and reports both the ratio of the minimum and

maximum reporting limits to the ESV as well as the ratio of the mean value (calculated using one-half of the reporting limit for each sample) to the ESV. Because these constituents were not detected, they are not known to be present on the site but the potential for unacceptable risks cannot be totally discounted because the reporting limits are higher than the ESVs. The magnitude of the ratios can be used to qualitatively evaluate the magnitude of the associated uncertainty (e.g., there is more uncertainty in terms of the potential for risk for a ratio of 100 relative to a ratio of 10). In surface soil, there were only three chemicals whose mean ratio exceeded one and all of the ratios were less than 10. In surface water, matrix interference affected the detection limits of metals, resulting in LODs above the project quantitation limits. Surface water at the SWMU 6 site is seawater with an average salinity of 31.2 parts per thousand, and, at the Laguna Kiani lagoon complex lobe, an average salinity of 38.0 parts per thousand. Instrument interference was primarily caused by calcium (range of 392 to 523mg/L), magnesium (range of 1,080 to 1,360mg/L), potassium (range of 408 to 544mg/L), and sodium (range of 10,300 to 15,900mg/L). Analysis of the lagoon samples caused the Inductively Coupled Plasma (ICP) instrument to shut down due to salt buildup on the tip of the nebulizer, affecting the aerosol flow rate and causing instrument drift. These interferences were addressed by sample dilution which reduced the actual measured concentration but increased reporting limits for both detected and nondetected metals. Dilutions for site samples were 20 X for SWMU 6, and 10 X for Laguna Kiani complex lobe. The final reported data are from the diluted runs with passing internal standards. In many cases, such as for aluminum, cadmium, lead, and thallium, the detection limits for diluted samples exceeded ESVs and therefore cause uncertainty regarding actual concentrations being present above the ESV. However, in surface water, the mean reporting limits were almost always less than 10 times ESVs and usually less than three times ESVs. In sediment, mean ratios were almost always less than one, except for a number of pesticides. However, mean ratios for these pesticides in sediments were also less than one when equilibrium partitioning-based values were considered (see **Tables F-25 and F-31**).

In summary, there were no chemicals with high mean ratios, suggesting that the associated uncertainties are low. Because standard analytical methods were used and the sample reporting limits were not elevated relative to the method reporting limits for the vast majority of samples and analytes, these uncertainties are considered acceptable and are unlikely to impact the conclusions of the ERA.

- Duplicate Analyses – When evaluating samples with field duplicates, the value used in the ERA was always the detect when one result was a detect and the duplicate was a non-detect, regardless of whether or not the non-detected value was higher. In these cases, the use of the detect has less uncertainty since it represents an actual measured value (versus an upper limit bound) and the two samples will have identical or similar reporting limits.

- Selection of COPCs – Chemicals without available ESVs for a medium were not retained as COPCs for risk evaluation unless they were detected. These uncertainties are unlikely to impact the conclusions of the ERA since these chemicals are not known to be present on the site.

- Ingestion TRVs – Data on the toxicity of many chemicals to the receptor species were sparse or lacking, requiring the extrapolation of data from other wildlife species or from laboratory studies with non-wildlife species. This is a typical limitation and extrapolation for ERAs because so few wildlife species have been tested directly for most chemicals. The uncertainties associated with toxicity extrapolation were minimized through the selection of the most appropriate test species for which suitable toxicity data were available. The factors considered in selecting a test species to represent a receptor species included taxonomic relatedness, trophic level, foraging method, and similarity of diet. It is difficult to predict if these extrapolations would result in overestimating or underestimating potential risks.

  A second uncertainty related to the derivation of ingestion TRVs applies to metals. Most of the toxicological studies on which the ingestion TRVs for metals were based used forms of the metal (such as salts) that have high water solubility and high bioavailability to receptors. Because the analytical samples on which site-specific exposure estimates were based measured total metal, regardless of form, and these highly bioavailable forms are expected to compose only a fraction of the total metal concentration, this is likely to

result in an overestimation of potential risks for these chemicals but not to the extent that it would unduly impact the conclusions of the ERA.

A third source of uncertainty related to the derivation of ingestion-based TRVs applies to mercury and selenium. The ingestion-based TRVs used for these two metals were based on organometallic (methylated) forms. TRVs for inorganic forms tend to be substantially higher. Given that inorganic forms likely contribute significantly to the total mercury and selenium, use of TRVs based on organometallic forms tends to make the TRVs for these metals extremely conservative and likely overestimates potential risk.

- Chemical Mixtures – Information on the toxicological effects of chemical interactions is generally lacking for ecological receptors, which required (as is standard for ERAs) that the chemicals be evaluated on a compound-by-compound basis during the comparison to ESVs. This could result in an underestimation of risk (if there are additive or synergistic effects among chemicals) or an overestimation of risks (if there are antagonistic effects among chemicals).

- Receptor Species Selection – Reptiles were selected as terrestrial receptors in the ERA but were not evaluated quantitatively even when exposure pathways were likely to be complete. This taxon was evaluated using other fauna as surrogates due to the general lack of taxon-specific toxicological data. This represents an uncertainty in the ERA.

  It was also assumed that any reptiles present in terrestrial habitats on the site were not exposed to significantly higher concentrations of chemicals and were not more sensitive to chemicals than other receptor species evaluated in the ERA. This assumption was a source of uncertainty in the ERA. In addition, there is some uncertainty associated with the use of specific receptor species to represent larger groups of organisms (e.g., guilds).

- Food Web Exposure Modeling – Chemical concentrations in aquatic food items (benthic invertebrates and fish) were modeled from measured sediment concentrations and were not directly measured in tissue samples collected to specifically evaluate ecological risk. The use of generic, literature-derived exposure models and bioaccumulation factors introduces some uncertainty into the resulting estimates. The values selected and methodology employed were intended to provide a conservative (SERA) or reasonable (Step 3A) estimate of potential food web exposure concentrations. However, mean concentrations of select metals (lead and zinc) and PCBs in fish and crab tissue samples collected for evaluation of potential human exposures were entered into the aquatic food web models (see **Attachment D**). This additional evaluation did not result in any changes to the conclusions of the ERA.

  Another source of uncertainty is the use of default assumptions for exposure parameters such as BCFs and BAFs. Although BCFs or BAFs for many bioaccumulative chemicals were readily available from the literature and were used in the ERA, the use of a default factor of 1.0 to estimate the concentration of some chemicals in receptor prey items is a source of uncertainty.

  Area use factors were assumed to equal one. This is a conservative assumption since a significant percentage of each upper trophic level receptor species' time could be spent foraging off-site in unimpacted areas or in areas where chemical concentrations are expected to be significantly lower.

- Total Versus Dissolved Metals – USEPA guidance (USEPA, 1996a) indicates that the dissolved metal fraction should be preferentially used to the total metal fraction in surface water screening. Both total and dissolved concentrations were used in the ERA for the surface water screen. High levels of suspended solids and sediment-adsorbed metals would result in overstating bioavailable surface water concentrations and thus potential exposures and risks.

- Mean Versus Maximum Media Concentrations – As is typical in an ERA, a finite number of samples of environmental media are used to develop the exposure estimates. The maximum measured concentration provides a conservative estimate for immobile biota or those with a limited home range. The most realistic exposure estimates for mobile species with relatively large home ranges and for species populations (even those that are immobile or have limited home ranges) are those based upon the mean chemical

concentrations in each medium to which these receptors are exposed. This is reflected in the wildlife dietary exposure models contained in the *Wildlife Exposure Factors Handbook* (USEPA, 1993a), which specify the use of average media concentrations. Given the mobility of the upper trophic level receptor species used in the ERA, the use of maximum chemical concentrations (rather than mean concentrations) in the SERA to estimate the exposure via food webs is very conservative. This conservatism was reduced to more realistic levels in the values selected for use in the Step 3A evaluation.

- Comparisons to Background Concentrations – Background concentrations were used to judge the site-relatedness of individual chemicals. If site concentrations were consistent with background levels, it was assumed that the concentrations were not related to known site-related source areas. There exists the possibility that concentrations below background were indeed site-related, rendering the assumption false. However the potential impact of this possibility is minimal since chemicals at concentrations consistent with background should exhibit no different ecological effects than commonly occurring in areas not affected by releases, regardless of their source.

1.7 References

Abrams EF, Derkics D, Fong CV, Guinan DK, Slimak KM (1975) Identification of organic compounds in effluents from industrial sources. Washington, DC, US Environmental Protection Agency (EPA-560/3-75-002; PB 241 641 OBA).

Agency for Toxic Substances and Disease Registry (ATSDR). 2008*. Toxicological profile for 1,1,2,2-tetrachloroethane*. September.

Agency for Toxic Substances and Disease Registry (ATSDR). 2006*. Toxicological profile for dichlorobenzenes*. August.

Bechtel Jacobs. 1998. *Biota sediment accumulation factors for invertebrates: review and recommendations for Oak Ridge Reservation.* Prepared for U.S. Department of Energy. BJC/OR-112. August 1998.

Beyer, W.N. 1990. *Evaluating soil contamination.* U.S. Fish and Wildlife Service Biological Report 90(2). 25 pp.

Beyer, W.N., E.E. Connor, and S. Gerould. 1994. Estimates of soil ingestion by wildlife. *Journal of Wildlife Management.* 58:375-382.

Brooke, A.P. 1994. Diet of the fishing bat, *Noctilio leporinus* (Chiroptera: Noctilionidae). *Journal of Mammology.* 75:212-218.

Buchman, M.F. 2008. *NOAA screening quick reference tables.* NOAA OR&R Report 08-1, Seattle, WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration. 34 pp.

Canadian Council of Ministers of the Environment (CCME). 2007. *Canadian soil quality guidelines for the protection of environmental and human health.* Summary Tables. Update 7.0. September.

Canadian Council of Ministers of the Environment (CCME). 2002. *Canadian sediment quality guidelines for the protection of aquatic life.* Summary Tables. Update 2002.

CH2M HILL, Inc. 2011a. *Draft Interim Deliverable for the Ecological Risk Assessment – SWMU 6, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico*. June.

CH2M HILL, Inc. 2011b. *Background Study for Vieques SWMU 6*. November.

CH2M HILL, Inc. 2010a. *Master Standard Operating Procedures, Protocols, and Plans. Environmental Restoration Program. Vieques, Puerto Rico*. Final. April.

CH2M HILL, Inc. 2010b. *Master Ecological Risk Assessment Protocol for Vieques Environmental Restoration Program – Update 1 (Addendum)*. Draft. August.

CH2M HILL, Inc. 2009a. *Draft Site Inspection/Expanded Site Inspection report, 7 Consent Order sites and 16 PI/PAOC sites Former Vieques Naval Training Range, Vieques, Puerto Rico.* Prepared for Department of the Navy, NAVFAC Atlantic. October.

CH2M HILL, Inc. 2009b. *Draft Remedial Investigation Report, Solid Waste Management Unit 4, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico.* Prepared for Department of the Navy, NAVFAC Atlantic. August.

CH2M HILL, Inc. 2002. *Final soil, groundwater, surface water, and sediment background investigation report, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico.* Prepared for Department of the Navy, NAVFAC Atlantic. October.

Chief of Naval Operations (CNO). 1999. *Navy policy for conducting ecological risk assessments.* Memorandum from Chief of Naval Operations to Commander, Naval Facilities Engineering Command. Ser N453E/9U595355.

Cope, W.G., J.G. Wiener, and R.G. Rada. 1990. Mercury accumulation in yellow perch in Wisconsin seepage lakes: relation to lake characteristics. *Environmental Toxicology and Chemistry.* 9:931-940.

Coulston, F. and A.C. Kolbye, Jr. (eds). 1994. Interpretive review of the potential adverse effects of chlorinated organic chemicals on human health and the environment. *Regulatory Toxicology and Pharmacology.* 20:S1-S1056.
Dunning, J.B., Jr. (editor). 2008. *CRC handbook of avian body masses, second edition.* CRC Press, Boca Raton, FL.

Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten. 1997a*. Toxicological benchmarks for screening contaminants of potential concern for effects on terrestrial plants: 1997 revision.* Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-85/R3.

Efroymson, R.A., M.E. Will, and G.W. Suter II. 1997b. *Toxicological benchmarks for screening contaminants of potential concern for effects on soil and litter invertebrates and heterotrophic process: 1997 revision.* Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-126/R2.

Geo-Marine. 2003. Integrated Natural Resources Management Plan (INRMP). Navy Lands on Vieques, Vieques Island, Puerto Rico. Plan Years 2003-2012. Final Draft.

Hays, H. 1972. Polyandry in the spotted sandpiper. Living Bird 11:43-57.

Hill, E.F., R.G. Heath, J.W. Spann, and J.D. Williams. 1975. *Lethal dietary toxicities of environmental pollutants to birds.* U.S. Fish and Wildlife Service Special Scientific Report - Wildlife No. 191. 61 pp.

Hirsch, M.P. 1998. Bioaccumulation of silver from laboratory-spiked sediments in the oligochaete (*Lumbriculus variegatus*). *Environmental Toxicology and Chemistry.* 17:605-609.

Humphreys, D. J. 1988. *Veterinary toxicology.* ISBN 0702012491.

Jones, D.S., G.W. Suter II, and R.N. Hull. 1997. *Toxicological benchmarks for screening contaminants of potential concern for effects on sediment-associated biota: 1997 revision.* Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-95/R4.

Krantzberg, G. and D. Boyd. 1992. The biological significance of contaminants in sediment from Hamilton Harbour, Lake Ontario. *Environmental Toxicology and Chemistry.* 11:1527-1540.

Long, E.R. and L.G. Morgan. 1990. *The potential for biological effects of sediment-sorbed contaminants tested in the National Status and Trends Program.* NOAA Technical Memorandum NOS OMA 52. March.

Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. *Environmental Management.* 19:81-97.

MacDonald, D.D., L.M. Dipinto, J. Field, C.G. Ingersoll, E.R. Long, and R.C. Swartz. 2000. Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. *Environmental Toxicology and Chemistry*. 19:1403–1413.

MacDonald, D.D. 1994. *Approach to the assessment of sediment quality in Florida coastal waters. Volume 1 – Development and evaluation of sediment quality assessment guidelines.* Prepared for the Florida Department of Environmental Protection, Office of Water Policy. November.

Maruya, K.A., R.W. Risebrough, and A.J. Horne. 1997. The bioaccumulation of polynuclear aromatic hydrocarbons by benthic invertebrates in an intertidal marsh. *Environmental Toxicology and Chemistry.* 16:1087-1097.

Maxson, S. J.; Oring, L. W. (1980) Breeding season time and energy budgets of the polyandrous spotted sandpiper. Behaviour 74: 200-263.

Miller, J. R., and J. T. Miller. 1948. Nesting of the spotted sandpiper at Detroit, Michigan. Auk 65:558-567.

Ministry of Housing, Spatial Planning, and Environment (MHSPE). 2001. *Technical evaluation of the intervention values for soil/sediment and groundwater.* RIVM Report 711701 023. February.

Ministry of Housing, Spatial Planning, and Environment (MHSPE). 2000. *Circular on target values and intervention values for soil remediation.* Directorate-General for Environmental Protection, Department of Soil Protection, The Hague, Netherlands. DBO/1999226863. February.

Myers, J. P., and L. P. Myers. 1979. Shorebirds of coastal Buenos Aires Province, Argentina. Ibis 121:186-200.

Nagy, K. A. 2001. Food requirements of wild animals: predictive equations for free-living mammals, reptiles, and birds. *Nutrition Abstracts and Reviews. Series B.* 71:21R-31R.

National Research Council Canada (NRCC). 2006. *Development of ecological and human health preliminary soil quality guidelines for energetic materials to ensure training sustainability of Canadian forces.* Final Report (Revised), NRC #45936. 30 June.

Naval Facilities Engineering Command (NAVFAC). 2003. *Navy guidance for conducting ecological risk assessments.* http://web.ead.anl.gov/ecorisk/. February.

Oliver, B.G. and A.J. Niimi. 1988. Trophodynamic analysis of polychlorinated biphenyl congeners and other chlorinated hydrocarbons in the Lake Ontario ecosystem. *Environmental Science and Technology.* 22:388-397.

Pascoe, G.A., R.J. Blanchet, and G. Linder. 1996. Food chain analysis of exposures and risks to wildlife at a metals-contaminated wetland. *Archives of Environmental Contamination and Toxicology.* 30:306-318.

PTI Environmental Services (PTI). 1995. *Bioaccumulation factor approach analysis for metals and polar organic compounds*. Washington State Department of Ecology. CA0U-03-03. October.

Puerto Rico, Commonwealth Office of the Governor, Environmental Quality Board (PREQB). 2010. *Puerto Rico water quality standards regulation.* March.

Rigdon, R.H. and J. Neal. 1963. Fluorescence of chickens and eggs following the feeding of benzpyrene crystals. *Texas Reports on Biology and Medicine.* 21(4):558-566.

Sample, B.E., J.J. Beauchamp, R.A. Efroymson, G.W. Suter II, and T.L. Ashwood. 1998a. *Development and validation of bioaccumulation models for earthworms.* Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-220.

Sample, B.E., J.J. Beauchamp, R.A. Efroymson, and G.W. Suter II. 1998b. *Development and validation of bioaccumulation models for small mammals.* Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-219.

Sample, B.E., M.S. Aplin, R.A. Efroymson, G.W. Suter II, and C.J.E. Welsh. 1997. *Methods and tools for estimation of the exposure of terrestrial wildlife to contaminants.* Environmental Sciences Division, Oak Ridge National Laboratory. ORNL/TM-13391.

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. *Toxicological benchmarks for wildlife: 1996 revision.* Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-86/R3.

Silva, M. and J.A. Downing. 1995. *CRC handbook of mammalian body masses*. CRC Press, Boca Raton, FL. 359 pp.

Standley, L.J. 1997. Effect of sedimentary organic matter composition on the partitioning and bioavailability of dieldrin to the oligochaete *Lumbriculus variegatus. Environmental Science and Technology.* 31:2577-2583.

Suter, G.W. II. 1993. *Ecological risk assessment*. Chelsea, Mich.: Lewis Publishers.

Suter, G.W. II. 1990. Endpoints for regional ecological risk assessment. *Environmental Management* 14:9-23.

Suter, G.W. II. 1989. Ecological endpoints. In *Ecological assessment of hazardous waste sites: a field and laboratory reference.* Ed. W. Warren-Hicks, B.R. Parkhurst, and S.S. Baker Jr., Chapter 2. EPA/600/3-89/013.

Suter, G.W. II and C.L. Tsao. 1996. *Toxicological benchmarks for screening potential contaminants of concern for effects on aquatic biota: 1996 revision.* Environmental Restoration Division, ORNL Environmental Restoration Program, ES/ER/TM-96/R2. 54 pp.

Talmage, S.S., D.M. Opresko, C.J. Maxwell, C.J.E. Welsh, F.M. Cretella, P.H. Reno, and F.B. Daniel. 1999. Nitroaromatic Munition Compounds: Environmental Effects and Screening Values. *Reviews of Environmental Contamination and Toxicology.* 161:1-156.

TERRETOX. 2002. On-line terrestrial toxicity database. U.S. Environmental Protection Agency.

Thomann, R.V., J.D. Mahony, and R. Mueller. 1995. Steady-state model of biota sediment accumulation factor for metals in two marine bivalves. *Environmental Toxicology and Chemistry.* 14:1989-1998.

U.S. Army Corps of Engineers (USACOE). 2010. *BSAF Database.* http://el.erdc.usace.army.mil/bsafnew/bsaf.html. Accessed February 2010.

U.S. Environmental Protection Agency (USEPA). 2009a. *Biota-Sediment Accumulation Factor Data Set, Version 1.0.* http://www.epa.gov/med/Prods_Pubs/bsaf.htm. Accessed June 2009.

U.S. Environmental Protection Agency (USEPA). 2009b. *National recommended water quality criteria - 2009.*

U.S. Environmental Protection Agency (USEPA). 2008a. *Ecological soil screening levels for chromium.* OSWER Directive 9285.7-66. April.

U.S. Environmental Protection Agency (USEPA). 2008b. *Procedures for the derivation of equilibrium partitioning sediment benchmarks (ESBs) for the protection of benthic organisms: Compendium of Tier 2 values for nonionic organics.* EPA/600/R-02/016. March.

U.S. Environmental Protection Agency (USEPA). 2007a. *Ecological soil screening levels for copper*. OSWER Directive 9285.7-68. February.

U.S. Environmental Protection Agency (USEPA). 2007b. *Ecological soil screening levels for manganese*. OSWER Directive 9285.7-71. April.

U.S. Environmental Protection Agency (USEPA). 2007c. *Ecological soil screening levels for nickel.* OSWER Directive 9285.7-76. March.

U.S. Environmental Protection Agency (USEPA). 2007d. *Ecological soil screening levels for selenium.* OSWER Directive 9285.7-72. July.

U.S. Environmental Protection Agency (USEPA). 2007e. *Ecological soil screening levels for zinc.* OSWER Directive 9285.7-73. June.

U.S. Environmental Protection Agency (USEPA). 2007f. *Ecological soil screening levels for DDT and metabolites.* OSWER Directive 9285.7-57. April.

U.S. Environmental Protection Agency (USEPA). 2007g. *Ecological soil screening levels for dieldrin.* OSWER Directive 9285.7-56. April.

U.S. Environmental Protection Agency (USEPA). 2007h. *Ecological soil screening levels for pentachlorophenol.* OSWER Directive 9285.7-58. April.

U.S. Environmental Protection Agency (USEPA). 2007i. *Ecological soil screening levels for polycyclic aromatic hydrocarbons (PAHs).* OSWER Directive 9285.7-78. June.

U.S. Environmental Protection Agency (USEPA). 2006a. *Ecological soil screening levels for silver*. OSWER Directive 9285.7-77. September.

U.S. Environmental Protection Agency (USEPA). 2006b. *EPA Region III BTAG screening benchmarks.* July/August.

U.S. Environmental Protection Agency (USEPA). 2005a. *Ecological soil screening levels for antimony.* OSWER Directive 9285.7-61. February.

U.S. Environmental Protection Agency (USEPA). 2005b. *Ecological soil screening levels for arsenic.* OSWER Directive 9285.7-62. March.

U.S. Environmental Protection Agency (USEPA). 2005c. *Ecological soil screening levels for barium*. OSWER Directive 9285.7-63. February.

U.S. Environmental Protection Agency (USEPA). 2005d. *Ecological soil screening levels for beryllium.* OSWER Directive 9285.7-64. February.

U.S. Environmental Protection Agency (USEPA). 2005e. *Ecological soil screening levels for cadmium.* OSWER Directive 9285.7-65. March.

U.S. Environmental Protection Agency (USEPA). 2005f. *Ecological soil screening levels for cobalt.* OSWER Directive 9285.7-67. March.

U.S. Environmental Protection Agency (USEPA). 2005g. *Ecological soil screening levels for lead.* OSWER Directive 9285.7-70. March.

U.S. Environmental Protection Agency (USEPA). 2003a. *Ecological soil screening level for aluminum*. OSWER Directive 9285.7-60. November.

U.S. Environmental Protection Agency (USEPA). 2003b. *Ecological soil screening level for iron*. OSWER Directive 9285.7-69. November.

U.S. Environmental Protection Agency (USEPA). 2002*. Perchlorate environmental contamination: toxicological review and risk characterization.* External Review Draft. 16 January. NCEA-1-0503.

U.S. Environmental Protection Agency (USEPA). 2001. *Supplemental guidance to RAGS: Region 4 ecological risk assessment bulletins.* Web version – 30 November.

U.S. Environmental Protection Agency (USEPA). 2000*. Bioaccumulation testing and interpretation for the purpose of sediment quality assessment - status and needs.* EPA/823/R-00/001.

U.S. Environmental Protection Agency (USEPA). 1999. *Screening level ecological risk assessment protocol for hazardous waste combustion facilities.* EPA/530/D-99/001A. Peer Review Draft. August.

U.S. Environmental Protection Agency (USEPA). 1997a. *Ecological risk assessment guidance for Superfund: process for designing and conducting ecological risk assessments.* Interim Final. EPA/540/R-97/006.

U.S. Environmental Protection Agency (USEPA). 1997b. *Mercury study report to Congress. Volume VI: an ecological assessment of anthropogenic mercury emissions in the United States.* EPA/452/R-97/008.

U.S. Environmental Protection Agency (USEPA). 1997c. *The incidence and severity of sediment contamination in surface waters of the United States. Volume 1: National Sediment Quality Survey.* EPA/823/R-97/006.

U.S. Environmental Protection Agency (USEPA). 1996a. *Ecotox thresholds.* Eco Update, Volume 3, Number 2. EPA/540/F-95/038. 12 pp.

U.S. Environmental Protection Agency (USEPA). 1996b. *Superfund chemical data matrix.* EPA/540/R-96/028.

U.S. Environmental Protection Agency (USEPA). 1995a. *Internal report on summary of measured, calculated and recommended log K_{ow} values.* Environmental Research Laboratory, Athens, GA. 10 April.

U.S. Environmental Protection Agency (USEPA). 1995b. *Great Lakes Water Quality Initiative criteria documents for the protection of wildlife: DDT, mercury, 2,3,7,8-TCDD, PCBs.* EPA/820/B-95/008.

U.S. Environmental Protection Agency (USEPA). 1993a. *Wildlife exposure factors handbook. Volume I of II.* EPA/600/R-93/187a.

U.S. Environmental Protection Agency (USEPA). 1993b. *Technical basis for deriving sediment quality criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning.* EPA/822/R-93/011.

U.S. Environmental Protection Agency (USEPA). 1989. *Risk assessment guidance for Superfund, Volume I. Human health evaluation manual (Part A).* Interim Final. EPA/540/1-89/002.

Washington State Department of Ecology. 1995. Sediment management standards. Chapter 173-204 WAC. December.

Wentsel, R.S., T.W. LaPoint, M. Simini, R.T. Checkai, D. Ludwig, and L.W. Brewer. 1996. *Tri-service procedural guidelines for ecological risk assessments.* U.S. Department of the Navy, U.S. Department of the Air Force, and U.S. Department of the Army. June.

Wiemeyer, S.N. 1996. Other organochlorine pesticides in birds. Pages 99-115 IN Beyer, W.N., G.H. Heinz, and A.W. Redmon-Norwood (eds). *Environmental contaminants in wildlife: interpreting tissue concentrations.* Lewis Publishers, Boca Raton, FL. 494 pp.

Tables

TABLE F-1
Water Column Parameter Measurements - SWMU 6 and Background Areas
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Date	Time	Depth of Water (ft)	Sampled Depth (ft)	DO (mg/L)	Temperature (^{o}C)	Salinity (ppt)	Conductivity (µmhos/cm)	pH (SU)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
SWMU 6											
SWMU 6 - Stations Within Site Boundary (SWMU 6 Lagoon)											
VWW06-SW03	2/3/2011	11:00	1.12	0.6	5.28	25.29	32.40	49,441	7.88	189.3	9.16
VWW06-SW04	2/3/2011	9:12	1.60	0.8	6.12	23.54	32.09	47,274	7.96	231.8	10.80
VWW06-SW05	2/3/2011	8:00	0.39	0.2	5.11	22.63	27.50	41,576	7.68	282.0	9.70
VWW06-SW06	2/3/2011	9:48	0.78	0.4	4.40	23.79	32.08	48,905	7.64	129.1	7.56
VWW07-SW07	2/3/2011	10:31	0.72	0.4	4.49	24.05	31.66	48,497	8.00	89.7	7.11
		Average	0.92	--	5.08	23.86	31.15	47,139	7.83	184.4	8.87
SWMU 6 - Offsite Stations, Immediately North of SWMU 6 (Laguna Kiani complex lobe)											
VWW06-SW01	2/7/2011	10:20	1.42	0.7	4.83	25.03	37.57	56,506	7.98	19.5	5.60
VWW06-SW02	2/7/2011	9:45	2.00	0.5	4.34	24.87	38.32	57,459	7.94	60.2	5.37
VWW06-SW02	2/7/2011	9:49		1.5	3.48	24.50	38.20	57,277	7.69	60.8	--
		Average	1.71	--	4.22	24.80	38.03	57,081	7.87	46.8	5.49
Background Areas											
Background - Laguna Arenas south side of Highway 200											
VWW06-SW14	2/7/2011	9:10	1.30	0.60	3.48	24.66	46.28	67,542	7.78	39.2	9.24
VWW06-SW15	2/7/2011	8:50	1.60	0.75	3.74	24.29	45.94	67,550	7.80	60.9	8.51
Background - Laguna Arenas north side of Highway 200											
VWW06-SW16	2/7/2011	8:05	1.35	0.7	2.26	24.31	46.45	68,075	7.48	30.2	12.40
VWW06-SW17	2/7/2011	7:45	1.73	0.5	1.98	24.65	45.53	66,918	7.38	76.6	12.40
VWW06-SW17	2/7/2011	7:47	1.73	1.0	2.05	24.70	45.59	66,984	7.36	33.2	--
Background - Laguna Kiani											
VWW06-SW18	2/8/2011	10:10	1.6	0.75	4.23	24.54	36.25	54,723	7.68	30.8	15.70
VWW06-SW19	2/8/2011	9:45	1.5	0.75	4.19	24.47	35.80	54,228	7.52	34.9	15.90
VWW06-SW20	2/8/2011	9:30	1.5	0.75	3.47	24.28	36.30	54,860	7.13	60.3	9.67

TABLE F-1
Water Column Parameter Measurements - SWMU 6 and Background Areas
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Date	Time	Depth of Water (ft)	Sampled Depth (ft)	DO (mg/L)	Temperature (^{o}C)	Salinity (ppt)	Conductivity (µmhos/cm)	pH (SU)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
Background - Laguna El Pobre											
VWW06-SW21	2/8/2011	8:35	1.40	0.75	3.18	24.11	35.20	53,313	7.52	56.0	6.09
VWW06-SW22	2/8/2011	8:10	1.75	0.50	3.25	24.09	35.18	53,405	7.39	61.5	6.86
VWW06-SW22	2/8/2011	8:12	1.75	1.25	3.07	24.18	35.94	54,385	7.37	62.0	--
VWW06-SW23	2/8/2011	7:35	1.35	0.60	3.26	23.87	34.16	51,899	7.29	32.6	10.60
		Average	1.55	--	3.18	24.35	39.89	59,490	7.48	48.2	10.74

-- = no data available
DO - dissolved oxygen
^{o}C - degrees Celsius
ft - feet
ppt - parts per thousand
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
SU - standard units
mV - millivolts
NTU - Nephelometric Turbidity Units

TABLE F-2
Physical Sediment Parameter Measurements - SWMU 6 and Background Areas
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

StationID	SampleID	Sample Date	Ammonia (mg/kg)	Sulfide (mg/kg)	Redox (mV)	pH (SU)	Total Organic Carbon (mg/kg)	SEM/AVS Ratio	Gravel (%)	Sand (%)	Silt/Clay (%)
SWMU 6 Lagoon											
VWW06-SD003	VWW06-SD003-0211	2/4/2011	60.6	99.0	543	7.75	18,000	32.2	2.1	61.4	36.5
VWW06-SD004	VWW06-SD004-0211	2/4/2011	62.5	130	541	7.80	16,000	3.83	8.1	61.5	30.4
VWW06-SD005	VWW06-SD005-0211	2/4/2011	53.1	160	544	7.85	13,000	19.4	16.1	58.5	25.4
VWW06-SD006	VWW06-SD006-0211	2/4/2011	41.5	130	546	7.76	16,000	5.21	4.7	73.8	21.5
VWW06-SD006	VWW06-SD006P-0211	2/4/2011	NS	NS	NS	NS	NS	NS	NS	NS	NS
VWW06-SD007	VWW06-SD007-0211	2/4/2011	60.3	70.0	526	7.45	13,000	1.12	0.6	77.2	22.2
VWW06-SD008	VWW06-SD008-0211	2/4/2011	27.2	19.0	532	8.11	7,500	0.11	0.4	84.5	15.0
VWW06-SD009	VWW06-SD009-0211	2/4/2011	141	54.0	536	7.83	24,000	36.7	0.8	27.9	71.2
VWW06-SD010	VWW06-SD010-0211	2/4/2011	40.4	89.0	538	7.82	6,700	2.48	1.4	72.7	25.9
		Average	61	94	538	7.80	14,275	12.6	4.3	64.7	31.0
Offsite Laguna Kiani Complex Lobe											
VWW06-SD001	VWW06-SD001-0211	2/8/2011	351	140	-181	7.40	35,000	0.04	0.6	47.3	52.2
VWW06-SD002	VWW06-SD002-0211	2/8/2011	167	170	-130	7.65	45,000	0.08	1.4	45.1	53.5
		Average	259	155	-156	7.53	40,000	0.06	1.0	46.2	52.9
Background Areas											
VWW06-SD014	VWW06-SD014-0211	2/7/2011	NS	NS	-158	7.22	NS	NS	NS	NS	NS
VWW06-SD015	VWW06-SD015-0211	2/7/2011	NS	NS	-148	7.17	NS	NS	NS	NS	NS
VWW06-SD016	VWW06-SD016-0211	2/7/2011	NS	NS	-152	7.26	NS	NS	NS	NS	NS
VWW06-SD017	VWW06-SD017-0211	2/7/2011	NS	NS	-156	7.07	NS	NS	NS	NS	NS
VWW06-SD018	VWW06-SD018-0211	2/8/2011	NS	NS	-121	7.30	NS	NS	NS	NS	NS
VWW06-SD019	VWW06-SD019-0211	2/8/2011	NS	NS	-125	7.25	NS	NS	NS	NS	NS
VWW06-SD020	VWW06-SD020-0211	2/8/2011	NS	NS	-154	7.05	NS	NS	NS	NS	NS
VWW06-SD021	VWW06-SD021-0211	2/8/2011	NS	NS	-119	7.52	NS	NS	NS	NS	NS
VWW06-SD022	VWW06-SD022-0211	2/8/2011	NS	NS	-105	7.30	NS	NS	NS	NS	NS
VWW06-SD023	VWW06-SD023-0211	2/8/2011	NS	NS	-154	7.23	NS	NS	NS	NS	NS
VWW06-SD023	VWW06-SD023P-0211	2/8/2011	NS	NS	-151	6.96	NS	NS	NS	NS	NS
		Average	--	--	-140	7.21	--	--	--	--	--

Shaded cells indicate field duplicates
NS - Not Sampled
mg/kg - milligram per kilogram
SU - standard units
mV - millivolts
SEM/AVS - simultaneously extracted metals / acid volatile sulfide

TABLE F-3
Animals and Plants Observed at SWMU 6 and Adjacent Laguna Arenas
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Common Name	Scientific Name	SWMU 6	Adjacent Laguna Arenas (similar habitat)
Mammals			
Mongoose	*Herpestes auropunctatus*		X
Birds			
Belted kingfisher	*Ceryle alcyon*	X	
Spotted sandpiper	*Actitis macularia*	X	
Ruddy turnstone	*Arenaria interpres*	X	
Blue-winged teal	*Anas discors*		X
Black-necked stilt	*Himantopus mexicanus*		X
Greater yellowlegs	*Tringa melanoleuca*	X	
Semipalmated sandpiper	*Calidris pusilla*		X
Wilson's plover	*Charadrius wilsonia*		X
Bananaquit	*Coereba flaveola*	X	X
Adelaide's warbler	*Dendroica adelaidae*	X	X
Yellow warbler	*Dendroica petechia*		X
Smooth-billed ani	*Crotophaga ani*	X	
Clapper rail	*Rallus longirostris*		X
Semipalmated plover	*Charadrius semipalmatus*	X	
Gray kingbird	*Tyrannus dominicensis*		X
Loggerhead kingbird	*Tyrannus caudifasciatus*		X
Great egret	*Ardea alba*		X
Great blue heron	*Ardea herodias*		X
Fish			
Snook	*Centropomus undecimalis*	X	X
White mullet	*Mugil curema*	X	
Checkered puffer	*Sphoeroides testudineus*	X	
Bigeye mojarra	*Eucinostomus havana*	X	X
Spotfin mojarra	*Eucinostomus argenteus*		X
Striped mojarra	*Diapterus plumieri*		X
Bigeye anchovy	*Anchoa lamprotaenia*		X
Crested goby	*Lophiogobius cyprinoides*		X
Redfin needlefish	*Strongylura notata*		X
Invertebrates			
Upside-down jellyfish	*Cassiopeia xamachana*	X	
Coffee bean snail	*Melampus coffeus*	X	
Hermit crab	unknown species	X	
Olive nerite	*Neritina reclivata*		X
Blue crab	*Callinectes sapidus*	X	X
Brown shrimp	*Penaeus aztecus*		X
Caribbean fiddler crab	*Uca rapax*	X	X
Common mud crab	*Panopeus herbstii*		X
Marbled marsh crab	*Sesarma ricordi*		X
White shrimp	*Penaeus setiferus*		X
Grass shrimp	*Paleomonetes sp.*	X	X
Ivory barnacle	*Balanus eburneus*		X
Plants			
Red mangrove	*Rhizophora mangle*	X	X
Black mangrove	*Avicennia germinans*	X	X
Seaside purslane	*Sesuvium portulacastrum*	X	
Acacia	*Acacia spp.*	X	X
Tropical sedge	*Fimbristylis cymosa*	X	
Turtle grass	*Thalassia testudinum*	X	

TABLE F-4
Federally Listed Species Occurring or Potentially Occurring at NASD Vieques
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Scientific Name (Common Name)	Federal Status
Plants	
Chaemacrista glandulosa var. mirabilis (Herb)	Endangered
Stahlia monosperma (Cobana negra)	Threatened
Calyptranthes thomasiana (Thomas' lidflower)	Endangered
Eugenia woodburyana (Evergreen tree)	Endangered
Goetzea elegans	Endangered
Reptiles and Amphibians	
Chelonia mydas (Green sea turtle)	Threatened
Dermochelys coriacea (Leatherback sea turtle)	Endangered
Eretmochelys imbricata (Hawksbill sea turtle)	Endangered
Caretta caretta (Loggerhead sea turtle)	Threatened
Birds	
Sterna dougalli dougalli (Roseate tern)	Threatened
Mammals	
Physeter macrocephalus (Sperm whale)	Endangered
Megaptera novaeangliae (Humpback whale)	Endangered
Trichechus manatus (West Indian manatee)	Endangered

Source: Vieques Integrated Natural Resource Plan, Plan Years 2003 - 2012 (Geo-Marine, 2003)

TABLE F-5
Samples Used in the Ecological Risk Assessment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Date	Sampled Depth Range (inches)
SWMU 6 - Onsite Samples			
Surface Water (SWMU 6 Lagoon)			
VWW06-SW003	VWW06-SW003-0211	2/3/2011	--
VWW06-SW004	VWW06-SW004-0211	2/3/2011	--
VWW06-SW005	VWW06-SW005-0211	2/3/2011	--
VWW06-SW006	VWW06-SW006-0211	2/3/2011	--
VWW06-SW007	VWW06-SW007-0211	2/3/2011	--
VWW06-SW007	VWW06-SW007P-0211	2/3/2011	--
Sediment (SWMU 6 Lagoon)			
VWW06-SD003	VWW06-SD003-0211	2/4/2011	0 - 6
VWW06-SD004	VWW06-SD004-0211	2/4/2011	0 - 6
VWW06-SD005	VWW06-SD005-0211	2/4/2011	0 - 6
VWW06-SD006	VWW06-SD006-0211	2/4/2011	0 - 6
VWW06-SD006	VWW06-SD006P-0211	2/4/2011	0 - 6
VWW06-SD007	VWW06-SD007-0211	2/4/2011	0 - 6
VWW06-SD008	VWW06-SD008-0211	2/4/2011	0 - 6
VWW06-SD009	VWW06-SD009-0211	2/4/2011	0 - 6
VWW06-SD010	VWW06-SD010-0211	2/4/2011	0 - 6
Surface Soil			
VWW06-SD011	VWW06-SD011-0211	2/4/2011	0 - 6
VWW06-SD011	VWW06-SD011P-0211	2/4/2011	0 - 6
VWW06-SO136	116701-06-Z-136	6/24/2009	0 - 6
SWMU 6 - Offsite Laguna Kiani Complex Lobe Samples			
Surface Water			
VWW06-SW001	VWW06-SW001-0211	2/7/2011	--
VWW06-SW002	VWW06-SW002-0211	2/7/2011	--
Sediment			
VWW06-SD001	VWW06-SD001-0211	2/8/2011	0 - 6
VWW06-SD002	VWW06-SD002-0211	2/8/2011	0 - 6
SWMU 6 - PCB Removal Area Samples			
Sediment			
VWW06-SS012	VWW06-SS012-0211	2/7/2011	0 - 6
VWW06-SS013	VWW06-SS013-0211	2/7/2011	0 - 6
VWW06-SS013	VWW06-SS013P-0211	2/7/2011	0 - 6
Lagoon Background Samples (Laguna Kiani, Laguna El Pobre, Laguna Arenas)			
Surface Water			
VWW06-SW014	VWW06-SW014-0211	2/7/2011	--
VWW06-SW015	VWW06-SW015-0211	2/7/2011	--
VWW06-SW016	VWW06-SW016-0211	2/7/2011	--
VWW06-SW017	VWW06-SW017-0211	2/7/2011	--
VWW06-SW018	VWW06-SW018-0211	2/8/2011	--
VWW06-SW019	VWW06-SW019-0211	2/8/2011	--
VWW06-SW020	VWW06-SW020-0211	2/8/2011	--
VWW06-SW021	VWW06-SW021-0211	2/8/2011	--
VWW06-SW022	VWW06-SW022-0211	2/8/2011	--
VWW06-SW023	VWW06-SW023-0211	2/8/2011	--
VWW06-SW023	VWW06-SW023P-0211	2/8/2011	--

TABLE F-5
Samples Used in the Ecological Risk Assessment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Station ID	Sample ID	Date	Sampled Depth Range (inches)
Sediment			
VWW06-SD014	VWW06-SD014-0211	2/7/2011	0 - 6
VWW06-SD015	VWW06-SD015-0211	2/7/2011	0 - 6
VWW06-SD016	VWW06-SD016-0211	2/7/2011	0 - 6
VWW06-SD017	VWW06-SD017-0211	2/7/2011	0 - 6
VWW06-SD018	VWW06-SD018-0211	2/8/2011	0 - 6
VWW06-SD019	VWW06-SD019-0211	2/8/2011	0 - 6
VWW06-SD020	VWW06-SD020-0211	2/8/2011	0 - 6
VWW06-SD021	VWW06-SD021-0211	2/8/2011	0 - 6
VWW06-SD022	VWW06-SD022-0211	2/8/2011	0 - 6
VWW06-SD023	VWW06-SD023-0211	2/8/2011	0 - 6
VWW06-SD023	VWW06-SD023P-0211	2/8/2011	0 - 6

Shaded cells indicate field duplicates

TABLE F-6
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Aquatic Habitats			
Survival, growth, and reproduction of benthic invertebrate communities	Are site-related chemical concentrations in surface water and surface sediment sufficient to adversely effect benthic invertebrate communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface water and sediment with medium-specific screening values	Benthic invertebrates
Survival, growth, and reproduction of aquatic plant communities	Are site-related chemical concentrations in surface water and surface sediment sufficient to adversely affect aquatic plant communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface water and sediment with medium-specific screening values	Aquatic plants
Survival, growth, and reproduction of fish communities	Are site-related chemical concentrations in surface water and surface sediment sufficient to adversely effect fish communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface water and sediment with medium-specific screening values	Fish
Survival, growth, and reproduction of avian aquatic invertivore populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume benthic invertebrates from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Spotted sandpiper
Survival, growth, and reproduction of avian aquatic piscivore (SERA)/ piscivore/invertivore (BERA) populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume fish and invertebrates from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Green heron
Survival, growth, and reproduction of mammalian aquatic piscivore populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume fish from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Fishing bat

TABLE F-6
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Terrestrial Habitats			
Survival, growth, and reproduction of terrestrial soil invertebrate communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect soil invertebrate communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface soil with soil screening values	Soil invertebrates
Survival, growth, and reproduction of terrestrial plant communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect terrestrial plant communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface soil with soil screening values	Terrestrial plants
Survival, growth, and reproduction of terrestrial reptile populations	Are site-related chemical concentrations in surface soil sufficient to adversely effect terrestrial reptile populations?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface soil with soil screening values	Reptiles

TABLE F-7
Bioaccumulative Chemicals List and Log K_{ow} Values For Chemicals Relevant to SWMU 6
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference
Metals			
Arsenic	-- - --	--	--
Cadmium	-- - --	--	--
Chromium[1]	-- - --	--	--
Copper	-- - --	--	--
Lead	-- - --	--	--
Mercury[2]	-- - --	--	--
Nickel	-- - --	--	--
Selenium	-- - --	--	--
Silver	-- - --	--	--
Zinc	-- - --	--	--
Polychlorinated Biphenyls[3]			
Aroclor-1016	Not reported	5.60	Sample et al. 1996
Aroclor-1221	Not reported	4.70	Jones et al. 1997
Aroclor-1232	Not reported	5.10	Jones et al. 1997
Aroclor-1242	Not reported	5.60	Jones et al. 1997
Aroclor-1248	Not reported	6.20	Jones et al. 1997
Aroclor-1254	Not reported	6.50	Jones et al. 1997
Aroclor-1260	Not reported	6.80	Jones et al. 1997
Pesticides			
4,4'-DDD	5.90 - 6.65	6.10	USEPA 1995a
4,4'-DDE	5.63 - 6.96	6.76	USEPA 1995a
4,4'-DDT	5.56 - 7.01	6.53	USEPA 1995a
Aldrin	5.11 - 7.50	6.50	USEPA 1995a
alpha-BHC	3.75 - 3.81	3.80	USEPA 1995a
alpha-Chlordane[4]	5.80 - 6.41	6.32	USEPA 1995a
beta-BHC	3.75 - 3.84	3.81	USEPA 1995a
delta-BHC	Not reported	4.10	USEPA 1996b
Dieldrin	3.63 - 6.20	5.37	USEPA 1995a
Endosulfan I	3.55 - 3.85	3.83	USEPA 1995a
Endosulfan II	3.62 - 4.52	4.52	USEPA 1995a
Endrin	2.92 - 5.20	5.06	USEPA 1995a
gamma-BHC (Lindane)	3.61 - 3.90	3.73	USEPA 1995a
gamma-Chlordane[4]	5.80 - 6.41	6.32	USEPA 1995a
Heptachlor	4.93 - 6.26	6.26	USEPA 1995a
Heptachlor epoxide	3.50 - 5.40	5.00	USEPA 1995a
Methoxychlor	4.20 - 5.60	5.08	USEPA 1995a
Toxaphene	4.33 - 5.56	5.50	USEPA 1995a
Volatile and Semivolatile Organic Compounds			
1,1,2,2-Tetrachloroethane[5]	2.31 - 2.64	2.39	USEPA 1995a
1,2,4-Trichlorobenzene	3.89 - 4.23	4.01	USEPA 1995a
1,2-Dichlorobenzene	3.20 - 3.61	3.43	USEPA 1995a
1,3-Dichlorobenzene	Not reported	3.50	USEPA 1996b
1,4-Dichlorobenzene	3.26 - 3.62	3.42	USEPA 1995a
Acenaphthene	3.77 - 4.49	3.92	USEPA 1995a
Acenaphthylene	Not reported	4.10	USEPA 1996b
Anthracene	4.44 - 4.80	4.55	USEPA 1995a
Benzo(a)anthracene	5.61 - 5.79	5.70	USEPA 1995a

TABLE F-7
Bioaccumulative Chemicals List and Log K_{ow} Values For Chemicals Relevant to SWMU 6
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference
Benzo(a)pyrene	5.98 - 6.34	6.11	USEPA 1995a
Benzo(b)fluoranthene	5.79 - 6.40	6.20	USEPA 1995a
Benzo(g,h,i)perylene	6.58 - 7.05	6.70	USEPA 1995a
Benzo(k)fluoranthene	6.12 - 6.27	6.20	USEPA 1995a
Chrysene	5.41 - 5.79	5.70	USEPA 1995a
Dibenz(a,h)anthracene	6.50 - 6.88	6.69	USEPA 1995a
Fluoranthene	4.84 - 5.39	5.12	USEPA 1995a
Fluorene	4.04 - 4.40	4.21	USEPA 1995a
Indeno(1,2,3-cd)pyrene	6.58 - 6.72	6.65	USEPA 1995a
Phenanthrene	4.37 - 4.57	4.55	USEPA 1995a
Pyrene	4.76 - 5.52	5.11	USEPA 1995a

[1] Listed as chromium VI but applied to total chromium

[2] Listed as methylmercury but applied to total mercury

[3] PCB congeners 8, 18, 28, 44, 52, 66, 77, 81, 101, 105, 118, 126, 128, 138, 153, 156, 169, 170, 180, 187, 195, 206, and 209 are also listed in USEPA (2000)

[4] Listed as "chlordane"

[5] Listed as "tetrachloroethane"

TABLE F-8
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Benthic Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Screening (Step 2)					
	BSAF (ww)	BAF (dw)[1]	Type	Principal Organisms	Basis	Reference
Metals						
Arsenic	--	0.690	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Cadmium	--	3.073	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Chromium	--	0.468	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Copper	--	7.957	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Lead	--	0.326	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Mercury	--	2.868	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Nickel	--	0.214	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Selenium	--	5.550	Marine	Molluscs	Average median	Thomann et al. 1995
Silver	--	0.180	Fresh	Oligochaete	Mean	Hirsch 1998
Zinc	--	4.759	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Pesticides						
4,4'-DDD	0.88	7.54	Marine/Estuarine	Worms	Single value	USACOE 2010
4,4'-DDE	0.88	7.54	Marine/Estuarine	Worms	Single value	DDD value
4,4'-DDT	0.16	1.37	Marine/Estuarine	Worms	90th percentile	USACOE 2010
Aldrin	0.42	2.07	Marine/Estuarine	Molluscs	Single value	USACOE 2010
alpha-BHC	1.00	8.61	Marine	Crustaceans	Single value	USACOE 2010
alpha-Chlordane	0.88	7.54	Marine/Estuarine	Worms	Single value	USACOE 2010
beta-BHC	1.00	8.61	Marine	Crustaceans	Single value	alpha-BHC value
delta-BHC	1.00	8.61	Marine	Crustaceans	Single value	alpha-BHC value
Dieldrin	--	4.92	Fresh	Lumbriculus	Geometric mean	Standley 1997
Endosulfan I	0.059	0.29	Marine/Estuarine	Molluscs	Single value	USACOE 2010 (endosulfan sulfate)
Endosulfan II	0.059	0.29	Marine/Estuarine	Molluscs	Single value	USACOE 2010 (endosulfan sulfate)
Endrin	0.49	2.40	Marine/Estuarine	Molluscs	Single value	USACOE 2010 (endrin aldehyde)
gamma-BHC (Lindane)	0.91	7.83	Marine/Estuarine	Crustaceans/worms	90th percentile	USACOE 2010
gamma-Chlordane	1.23	10.63	Marine/Estuarine	Worms	Single value	USACOE 2010
Heptachlor	0.061	0.30	Fresh/Marine	Molluscs	90th percentile	USACOE 2010
Heptachlor Epoxide	0.302	1.49	Marine/Estuarine	Molluscs	Single value	USACOE 2010
Methoxychlor	1.00	1.00	--	--	Assumed	--
Toxaphene	1.00	1.00	--	--	Assumed	--

TABLE F-8
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Benthic Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Screening (Step 2)					
	BSAF (ww)	BAF (dw)[1]	Type	Principal Organisms	Basis	Reference
Polychlorinated Biphenyls						
Aroclor-1016	--	21.9	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Aroclor-1221	--	21.9	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Aroclor-1232	--	21.9	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Aroclor-1242	--	21.9	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Aroclor-1248	--	21.9	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Aroclor-1254	--	21.9	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Aroclor-1260	--	21.9	Fresh	Invertebrate infauna	90th percentile	Bechtel Jacobs 1998
Volatile and Semivolatile Organic Compounds						
1,1,2,2-Tetrachloroethane	1.00	1.00	--	--	Assumed	--
1,2,4-Trichlorobenzene	--	0.48	Fresh	Amphipods/oligochaetes	Maximum	Oliver and Niimi 1988
1,2-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
1,3-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
1,4-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
Acenaphthene	2.04	17.6	Estuarine	Polychaetes	Single value	Maruya et al. 1997
Acenaphthylene	2.04	17.6	Estuarine	Polychaetes	Single value	acenaphthene value
Anthracene	0.614	5.29	Marine/Estuarine	Crustaceans/worms	90th percentile	USACOE 2010
Benzo(a)anthracene	0.209	1.80	Fresh/Marine	Crustaceans/worms/insects	90th percentile	USACOE 2010
Benzo(a)pyrene	0.70	6.06	Fresh/Marine	Crustaceans/worms	90th percentile	USACOE 2010
Benzo(b)fluoranthene	0.250	2.15	Marine/Estuarine	Crustaceans/worms	90th percentile	USACOE 2010
Benzo(g,h,i)perylene	0.151	1.30	Marine/Estuarine	Worms	90th percentile	USACOE 2010
Benzo(k)fluoranthene	0.214	1.84	Marine/Estuarine	Worms	90th percentile	USACOE 2010
Chrysene	0.249	2.14	Marine/Estuarine	Crustaceans/worms	90th percentile	USACOE 2010
Dibenz(a,h)anthracene	2.00	17.2	Estuarine	Polychaetes	Maximum	Maruya et al. 1997 (all PAHs)
Fluoranthene	0.172	1.48	Fresh/Marine	Crustaceans/worms	90th percentile	USACOE 2010
Fluorene	0.88	7.61	Estuarine	Polychaetes	90th percentile	Maruya et al. 1997
Indeno(1,2,3-cd)pyrene	0.122	1.05	Marine/Estuarine	Worms	90th percentile	USACOE 2010
Phenanthrene	0.285	2.45	Marine/Estuarine	Worms	90th percentile	USACOE 2010
Pyrene	1.52	13.12	Fresh/Marine	Crustaceans/worms	90th percentile	USEPA 2009a; USACOE 2010

[1] Wet-weight (ww) BSAFs are converted to dry-weight (dw) using the following values:

Lipids (%):	1.48	bivalves	2.58	macroinvertebrates	USACOE 2010
TOC (%):	1.43	Mean measured (SWMU 6 lagoon samples)			
Percent soilds:	0.21	USEPA 1993a			

TABLE F-8
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Benthic Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Baseline (Step 3A)					
	BSAF (ww)	BAF (dw)[1]	Type	Principal Organisms	Basis	Reference
Metals						
Arsenic	--	--	--	--	see Table C-9	--
Cadmium	--	--	--	--	see Table C-9	--
Chromium	--	--	--	--	see Table C-9	--
Copper	--	0.824	Fresh	Invertebrate infauna	Geometric mean	Bechtel Jacobs 1998
Lead	--	--	--	--	see Table C-9	--
Mercury	--	1.186	Fresh	Invertebrate infauna	Geometric mean	Bechtel Jacobs 1998
Nickel	--	--	--	--	see Table C-9	--
Selenium	--	5.550	Marine	Molluscs	Average median	Thomann et al. 1995
Silver	--	0.180	Fresh	Oligochaete	Mean	Hirsch 1998
Zinc	--	--	--	--	see Table C-9	--
Pesticides						
4,4'-DDD	0.88	7.54	Marine/Estuarine	Worms	Single value	USACOE 2010
4,4'-DDE	0.88	7.54	Marine/Estuarine	Worms	Single value	DDD value
4,4'-DDT	0.12	0.99	Marine/Estuarine	Worms	Median	USACOE 2010
Aldrin	0.42	2.07	Marine/Estuarine	Molluscs	Single value	USACOE 2010
alpha-BHC	1.00	8.61	Marine	Crustaceans	Single value	USACOE 2010
alpha-Chlordane	0.88	7.54	Marine/Estuarine	Worms	Single value	USACOE 2010
beta-BHC	1.00	8.61	Marine	Crustaceans	Single value	alpha-BHC value
delta-BHC	1.00	8.61	Marine	Crustaceans	Single value	alpha-BHC value
Dieldrin	--	4.92	Fresh	Lumbriculus	Geometric mean	Standley 1997
Endosulfan I	0.059	0.29	Marine/Estuarine	Molluscs	Single value	USACOE 2010 (endosulfan sulfate)
Endosulfan II	0.059	0.29	Marine/Estuarine	Molluscs	Single value	USACOE 2010 (endosulfan sulfate)
Endrin	0.49	2.40	Marine/Estuarine	Molluscs	Single value	USACOE 2010 (endrin aldehyde)
gamma-BHC (Lindane)	0.20	1.72	Marine/Estuarine	Crustaceans/worms	Median	USACOE 2010
gamma-Chlordane	1.23	10.63	Marine/Estuarine	Worms	Single value	USACOE 2010
Heptachlor	0.046	0.23	Fresh/Marine	Molluscs	Median	USACOE 2010
Heptachlor Epoxide	0.302	1.49	Marine/Estuarine	Molluscs	Single value	USACOE 2010
Methoxychlor	1.00	1.00	--	--	Assumed	--
Toxaphene	1.00	1.00	--	--	Assumed	--

TABLE F-8
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Benthic Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Baseline (Step 3A)					
	BSAF (ww)	BAF (dw)[1]	Type	Principal Organisms	Basis	Reference
Polychlorinated Biphenyls						
Aroclor-1016	--	--	--	--	see Table C-9	--
Aroclor-1221	--	--	--	--	see Table C-9	--
Aroclor-1232	--	--	--	--	see Table C-9	--
Aroclor-1242	--	--	--	--	see Table C-9	--
Aroclor-1248	--	--	--	--	see Table C-9	--
Aroclor-1254	--	--	--	--	see Table C-9	--
Aroclor-1260	--	--	--	--	see Table C-9	--
Volatile and Semivolatile Organic Compounds						
1,1,2,2-Tetrachloroethane	1.00	1.00	--	--	Assumed	--
1,2,4-Trichlorobenzene	--	0.26	Fresh	Amphipods/oligochaetes	Mean	Oliver and Niimi 1988
1,2-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
1,3-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
1,4-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
Acenaphthene	2.04	17.6	Estuarine	Polychaetes	Single value	Maruya et al. 1997
Acenaphthylene	2.04	17.6	Estuarine	Polychaetes	Single value	acenaphthene value
Anthracene	0.326	2.80	Marine/Estuarine	Crustaceans/worms	Median	USACOE 2010
Benzo(a)anthracene	0.092	0.80	Fresh/Marine	Crustaceans/worms/insects	Median	USACOE 2010
Benzo(a)pyrene	0.035	0.301	Fresh/Marine	Crustaceans/worms	Median	USACOE 2010
Benzo(b)fluoranthene	0.002	0.020	Marine/Estuarine	Crustaceans/worms	Median	USACOE 2010
Benzo(g,h,i)perylene	0.002	0.014	Marine/Estuarine	Worms	Median	USACOE 2010
Benzo(k)fluoranthene	0.141	1.22	Marine/Estuarine	Worms	Median	USACOE 2010
Chrysene	0.106	0.92	Marine/Estuarine	Crustaceans/worms	Median	USACOE 2010
Dibenz(a,h)anthracene	0.200	1.72	Estuarine	Polychaetes	Median	Maruya et al. 1997 (all PAHs)
Fluoranthene	0.089	0.77	Fresh/Marine	Crustaceans/worms	Median	USACOE 2010
Fluorene	0.299	2.57	Estuarine	Polychaetes	Median	Maruya et al. 1997
Indeno(1,2,3-cd)pyrene	0.002	0.015	Marine/Estuarine	Worms	Median	USACOE 2010
Phenanthrene	0.247	2.12	Marine/Estuarine	Worms	Median	USACOE 2010
Pyrene	0.290	2.50	Fresh/Marine	Crustaceans/worms	Median	USEPA 2009a; USACOE 2010

[1] Wet-weight (ww) BSAFs are converted to dry-weight (dw) using the following values:

Lipids (%):	1.48	bivalves	2.58	macroinvertebrates	USACOE 2010
TOC (%):	1.43	Mean measured (SWMU 6 lagoon samples)			
Percent soilds:	0.21	USEPA 1993a			

TABLE F-9
Bioconcentration/Bioaccumulation Factor Models (Dry Weight)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Benthic Invertebrates[1]	Reference
Metals		
Arsenic	$C_i = 10^{(-0.292 + 0.754(\log Csd))}$	Bechtel Jacobs 1998
Cadmium	$C_i = 10^{(-0.314 + 0.513(\log Csd))}$	Bechtel Jacobs 1998
Chromium	$C_i = 10^{(0.2092 + 0.365(\log Csd))}$	Bechtel Jacobs 1998
Lead	$C_i = 10^{(-0.515 + 0.653(\log Csd))}$	Bechtel Jacobs 1998
Nickel	$C_i = 10^{(-0.440 + 0.695(\log Csd))}$	Bechtel Jacobs 1998
Zinc	$C_i = 10^{(1.89 + 0.126(\log Csd))}$	Bechtel Jacobs 1998
PCBs		
Aroclor-1016	$C_i = 10^{(0.590 + 1.110(\log Csd))}$	Bechtel Jacobs 1998
Aroclor-1221	$C_i = 10^{(0.590 + 1.110(\log Csd))}$	Bechtel Jacobs 1998
Aroclor-1232	$C_i = 10^{(0.590 + 1.110(\log Csd))}$	Bechtel Jacobs 1998
Aroclor-1242	$C_i = 10^{(0.590 + 1.110(\log Csd))}$	Bechtel Jacobs 1998
Aroclor-1248	$C_i = 10^{(0.590 + 1.110(\log Csd))}$	Bechtel Jacobs 1998
Aroclor-1254	$C_i = 10^{(0.590 + 1.110(\log Csd))}$	Bechtel Jacobs 1998
Aroclor-1260	$C_i = 10^{(0.590 + 1.110(\log Csd))}$	Bechtel Jacobs 1998

[1] Where C_i = Concentration in benthic invertebrate (mg/kg dry wt) and C_{sd} = Concentration in sediment (mg/kg dry wt)

TABLE F-10
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Fish
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Screening (Step 2)				
	BSAF (ww)	BAF (dw)[1]	Type	Basis	Reference
Metals					
Arsenic	--	0.126	Fresh	Mean	Pascoe et al. 1996
Cadmium	--	0.220	Marine	Median	PTI 1995
Chromium	--	0.038	Fresh	Mean	Krantzberg and Boyd 1992
Copper	--	0.100	Fresh	Mean	Krantzberg and Boyd 1992
Lead	--	0.130	Marine	Median	PTI 1995
Mercury	--	4.58	Fresh	Maximum	Cope et al. 1990
Nickel	--	1.00	--	Assumed	--
Selenium	--	1.00	--	Assumed	--
Silver	--	1.00	--	Assumed	--
Zinc	--	1.30	Marine	Median	PTI 1995
Pesticides					
4,4'-DDD	1.54	25.8	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
4,4'-DDE	17.3	290	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
4,4'-DDT	1.75	29.4	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Aldrin	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
alpha-BHC	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
alpha-Chlordane	2.61	43.9	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
beta-BHC	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
delta-BHC	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Dieldrin	5.40	90.8	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Endosulfan I	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Endosulfan II	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Endrin	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
gamma-BHC (Lindane)	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
gamma-Chlordane	2.00	33.7	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Heptachlor	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Heptachlor Epoxide	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Methoxychlor	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Toxaphene	1.80	30.3	Fresh/Marine	Median	USEPA 1997c

TABLE F-10
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Fish
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Screening (Step 2)				
	BSAF (ww)	BAF (dw)[1]	Type	Basis	Reference
Polychlorinated Biphenyls					
Aroclor-1016	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1221	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1232	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1242	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1248	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1254	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1260	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Volatile and Semivolatile Organic Compounds					
1,1,2,2-Tetrachloroethane	1.00	1.00	--	Assumed	--
1,2,4-Trichlorobenzene	0.175	2.94	Marine	90th percentile	USEPA 2009a
1,2-Dichlorobenzene	0.112	1.88	Marine	Single value	USEPA 2009a
1,3-Dichlorobenzene	0.020	0.34	Marine	Single value	USEPA 2009a
1,4-Dichlorobenzene	0.014	0.24	Marine	Single value	USEPA 2009a
Acenaphthene	0.043	0.72	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Acenaphthylene	0.027	0.45	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Anthracene	0.013	0.22	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Benzo(a)anthracene	0.031	0.52	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Benzo(a)pyrene	0.004	0.06	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Benzo(b)fluoranthene	0.004	0.07	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Benzo(g,h,i)perylene	0.057	0.95	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Benzo(k)fluoranthene	0.004	0.06	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Chrysene	0.022	0.38	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Dibenz(a,h)anthracene	0.004	0.06	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Fluoranthene	0.010	0.16	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Fluorene	0.124	2.09	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Indeno(1,2,3-cd)pyrene	0.040	0.67	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Phenanthrene	0.062	1.05	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Pyrene	0.046	0.78	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010

[1] Wet-weight (ww) BSAFs are converted to dry-weight (dw) using the following values:

Lipids (%):	6.00	USEPA 1997c; USACOE 2010
TOC (%):	1.43	Mean measured (SWMU 6 lagoon samples)
Percent soilds:	0.25	USEPA 1993a

TABLE F-10
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Fish
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Baseline (Step 3A)				
	BSAF (ww)	BAF (dw)[1]	Type	Basis	Reference
Metals					
Arsenic	--	0.126	Fresh	Mean	Pascoe et al. 1996
Cadmium	--	0.220	Marine	Median	PTI 1995
Chromium	--	0.038	Fresh	Mean	Krantzberg and Boyd 1992
Copper	--	0.100	Fresh	Mean	Krantzberg and Boyd 1992
Lead	--	0.130	Marine	Median	PTI 1995
Mercury	--	3.25	Fresh	Mean	Cope et al. 1990
Nickel	--	1.00	--	Assumed	--
Selenium	--	1.00	--	Assumed	--
Silver	--	1.00	--	Assumed	--
Zinc	--	1.30	Marine	Median	PTI 1995
Pesticides					
4,4'-DDD	0.74	12.42	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
4,4'-DDE	1.22	20.4	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
4,4'-DDT	0.80	13.39	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Aldrin	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
alpha-BHC	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
alpha-Chlordane	1.02	17.1	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
beta-BHC	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
delta-BHC	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Dieldrin	0.77	12.90	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Endosulfan I	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Endosulfan II	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Endrin	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
gamma-BHC (Lindane)	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
gamma-Chlordane	1.14	19.1	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Heptachlor	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Heptachlor Epoxide	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Methoxychlor	1.80	30.3	Fresh/Marine	Median	USEPA 1997c
Toxaphene	1.80	30.3	Fresh/Marine	Median	USEPA 1997c

TABLE F-10
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Fish
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Baseline (Step 3A)				
	BSAF (ww)	BAF (dw)[1]	Type	Basis	Reference
Polychlorinated Biphenyls					
Aroclor-1016	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1221	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1232	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1242	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1248	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1254	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Aroclor-1260	1.85	31.1	Fresh/Marine	Median	USEPA 1997c
Volatile and Semivolatile Organic Compounds					
1,1,2,2-Tetrachloroethane	1.00	1.00	--	Assumed	--
1,2,4-Trichlorobenzene	0.132	2.22	Marine	Median	USEPA 2009a
1,2-Dichlorobenzene	0.112	1.88	Marine	Single value	USEPA 2009a
1,3-Dichlorobenzene	0.020	0.34	Marine	Single value	USEPA 2009a
1,4-Dichlorobenzene	0.014	0.24	Marine	Single value	USEPA 2009a
Acenaphthene	0.035	0.59	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Acenaphthylene	0.014	0.23	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Anthracene	0.008	0.14	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Benzo(a)anthracene	0.002	0.04	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Benzo(a)pyrene	0.002	0.03	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Benzo(b)fluoranthene	0.003	0.04	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Benzo(g,h,i)perylene	0.004	0.07	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Benzo(k)fluoranthene	0.002	0.04	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Chrysene	0.003	0.04	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Dibenz(a,h)anthracene	0.002	0.04	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Fluoranthene	0.003	0.05	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Fluorene	0.024	0.40	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Indeno(1,2,3-cd)pyrene	0.002	0.04	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Phenanthrene	0.008	0.14	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Pyrene	0.003	0.06	Fresh/Marine	Median	USEPA 2009a; USACOE 2010

[1] Wet-weight (ww) BSAFs are converted to dry-weight (dw) using the following values:

Lipids (%):	6.00	USEPA 1997c; USACOE 2010
TOC (%):	1.43	Mean measured (SWMU 6 lagoon samples)
Percent soilds:	0.25	USEPA 1993a

TABLE F-11
Exposure Parameters for Upper Trophic Level Ecological Receptors - Screening
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
Birds						
Green heron	0.138	Dunning 2008 (minimum for male/female - Caibbean)	0.0214	allometric equation (USEPA 1993a)[1]	0.0257	allometric equation (Nagy 2001)[3]
Spotted sandpiper	0.029	Dunning 2008 (minimum - Pennsylvania [gender not reported])	0.0089	allometric equation (USEPA 1993a)[1]	0.0105	allometric equation (Nagy 2001)[3]
Mammals						
Fishing bat	0.0314	Silva and Downing 1995 (minimum for male/female - Trinidad/Tobago)	0.0103	allometric equation (USEPA 1993a)[2]	0.0070	allometric equation (Nagy 2001)[4]

1 - All birds equation: $0.059\ (BW)^{0.67}$ (maximum body weight used: heron - 0.220 kg; sandpiper - 0.0598 kg)

2 - All mammals equation: $0.099\ (BW)^{0.90}$ (maximum body weight used: fishing bat - 0.0813 kg)

3 - All birds equation: $(0.638*((BW*1000)^{0.685})/1000$ (maximum body weight used: heron - 0.220 kg; sandpiper - 0.0598 kg)

4 - Bat equation used: $(0.365*((BW*1000)^{0.671}))/1000$ (maximum body weight used: fishing bat - 0.0813 kg)

TABLE F-11
Exposure Parameters for Upper Trophic Level Ecological Receptors - Screening
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terrestrial Plants	Soil Invertebrates	Small Mammals	Fish	Aquatic Plants	Aquatic Invertebrates	Reference	Value	Reference
Birds									
Green heron	0	0	0	100	0	0	Exclusive diet	0	Sample et al. 1997
Spotted sandpiper	0	0	0	0	0	82.0	USEPA 1993a	18.0	Beyer et al. 1994
Mammals									
Fishing bat	0	0	0	100	0	0	Brooke 1994 (aquatic dietary component)	0	Assumed based upon diet

TABLE F-12
Exposure Parameters for Upper Trophic Level Ecological Receptors - Baseline
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)		Home Range (ha)	
	Value	Reference	Value	Reference	Value	Reference	Value	Reference
Birds								
Green heron	0.187	Dunning 2008 (mean for male/female - Caibbean)	0.0192	allometric equation (USEPA 1993a)[1]	0.0230	allometric equation (Nagy 2001)[3]	No data	--
Spotted sandpiper	0.0404	Pennsylvania [gender not reported])	0.0069	allometric equation (USEPA 1993a)[1]	0.0080	allometric equation (Nagy 2001)[3]	0.25	USEPA 1993a (approximate)
Mammals								
Fishing bat	0.0544	for male/female - Trinidad/Tobago)	0.0072	allometric equation (USEPA 1993a)[2]	0.0053	allometric equation (Nagy 2001)[4]	No data	--

1 - All birds equation: $0.059\ (BW)^{0.67}$

2 - All mammals equation: $0.099\ (BW)^{0.90}$

3 - All birds equation: $(0.638*((BW*1000)^{0.685)})/1000$

4 - Bat equation used: $(0.365*((BW*1000)^{0.671}))/1000$

TABLE F-12
Exposure Parameters for Upper Trophic Level Ecological Receptors - Baseline
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terrestrial Plants	Soil Invertebrates	Small Mammals	Fish	Aquatic Plants	Aquatic Invertebrates	Reference	Value	Reference
Birds									
Green heron	0	0	0	71.0	0	29.0	Sample et al. 1997	0	Sample et al. 1997
Spotted sandpiper	0	0	0	0	0	82.0	USEPA 1993a	18.0	Beyer et al. 1994
Mammals									
Fishing bat	0	0	0	100	0	0	Brooke 1994 (aquatic dietary component)	0	Assumed based upon diet

TABLE F-13
Marine Surface Water Ecological Screening Values (ESVs)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
Inorganics					
Aluminum	87.0	ug/L	Freshwater	USEPA 2009b	AWQC
Antimony	500	ug/L		Buchman 2008	Proposed AWQC
Arsenic	36.0	ug/L	Total	PREQB 2010; USEPA 2009b	Water Quality Standards (Aquatic Life);
Arsenic	36.0	ug/L	Dissolved	USEPA 2009b	AWQC
Barium	200	ug/L		Buchman 2008	British Columbia value
Beryllium	100	ug/L		Buchman 2008	British Columbia value
Cadmium	8.85	ug/L	Total	PREQB 2010; USEPA 2009b	Water Quality Standards (Aquatic Life);
Cadmium	8.80	ug/L	Dissolved	USEPA 2009b	AWQC
Chromium	50.4	ug/L	Total	PREQB 2010; USEPA 2009b	Water Quality Standards (Aquatic Life);
Chromium	50.0	ug/L	Dissolved	USEPA 2009b	AWQC
Cobalt	23.0	ug/L	Freshwater	Suter and Tsao 1996	Secondary Chronic Value
Copper	3.73	ug/L	Total	PREQB 2010; USEPA 2009b	Water Quality Standards (Aquatic Life);
Copper	3.10	ug/L	Dissolved	USEPA 2009b	AWQC
Iron	50.0	ug/L		Buchman 2008	British Columbia value
Lead	8.52	ug/L	Total	PREQB 2010; USEPA 2009b	Water Quality Standards (Aquatic Life);
Lead	8.10	ug/L	Dissolved	USEPA 2009b	AWQC
Manganese	100	ug/L		Buchman 2008	British Columbia value
Mercury	1.11	ug/L	Total	USEPA 2009b	AWQC
Mercury	0.94	ug/L	Dissolved	USEPA 2009b	AWQC
Nickel	8.28	ug/L	Total	PREQB 2010; USEPA 2009b	Water Quality Standards (Aquatic Life);
Nickel	8.20	ug/L	Dissolved	USEPA 2009b	AWQC
Selenium	71.1	ug/L	Total	PREQB 2010; USEPA 2009b	Water Quality Standards (Aquatic Life);
Selenium	71.0	ug/L	Dissolved	USEPA 2009b	AWQC
Silver	2.24	ug/L		PREQB 2010	Water Quality Standards (Aquatic Life)
Thallium	21.3	ug/L		USEPA 2001	USEPA Region 4 value
Vanadium	50.0	ug/L		Buchman 2008	British Columbia value
Zinc	85.6	ug/L	Total	PREQB 2010; USEPA 2009b	Water Quality Standards (Aquatic Life);
Zinc	81.0	ug/L	Dissolved	USEPA 2009b	AWQC
Pesticides					
4,4'-DDD	0.001	ug/L	FRV	USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
4,4'-DDE	0.001	ug/L	FRV	USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
4,4'-DDT	0.001	ug/L	FRV	USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
Aldrin	0.13	ug/L		USEPA 2001	USEPA Region 4 value

TABLE F-13
Marine Surface Water Ecological Screening Values (ESVs)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
alpha-BHC	25.0	ug/L		USEPA 2006b	TRNCC (2001) value
alpha-Chlordane	0.004	ug/L	FRV	USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
beta-BHC	25.0	ug/L		alpha-BHC value	
delta-BHC	25.0	ug/L		alpha-BHC value	
Dieldrin	0.11	ug/L	FCV	USEPA 1996a	
Endosulfan I	0.0087	ug/L		USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
Endosulfan II	0.0087	ug/L		USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
Endosulfan sulfate	0.0087	ug/L		Endosulfan value	Water Quality Standards (Aquatic Life);
Endrin	0.01	ug/L	FCV	USEPA 1996a	
Endrin aldehyde	0.01	ug/L	FCV	Endrin value	
Endrin ketone	0.01	ug/L	FCV	Endrin value	
gamma-BHC (Lindane)	0.16	ug/L		PREQB 2010	Water Quality Standards (Aquatic Life)
gamma-Chlordane	0.004	ug/L	FRV	USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
Heptachlor	0.0036	ug/L	FRV	USEPA 2009b	AWQC
Heptachlor epoxide	0.0036	ug/L	FRV	USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
Methoxychlor	0.03	ug/L		USEPA 2009b; PREQB 2010	Water Quality Standards (Aquatic Life);
Toxaphene	0.21	ug/L	FCV	USEPA 1996a	
Polychlorinated Biphenyls					
Aroclor-1016	0.03	ug/L	FRV	USEPA 2009b	AWQC
Aroclor-1221	0.03	ug/L	FRV	USEPA 2009b	AWQC
Aroclor-1232	0.03	ug/L	FRV	USEPA 2009b	AWQC
Aroclor-1242	0.03	ug/L	FRV	USEPA 2009b	AWQC
Aroclor-1248	0.03	ug/L	FRV	USEPA 2009b	AWQC
Aroclor-1254	0.03	ug/L	FRV	USEPA 2009b	AWQC
Aroclor-1260	0.03	ug/L	FRV	USEPA 2009b	AWQC
Semivolatile Organic Compounds					
1-Methylnaphthalene	--	--	--	--	
2-Methylnaphthalene	330	ug/L	Freshwater	Buchman 2008	USEPA Region 5 value
Acenaphthene	40.0	ug/L	FCV	USEPA 1996a	
Acenaphthylene	--	--	--	--	
Anthracene	0.18	ug/L		USEPA 2006b	TRNCC (2001) value
Benzo(a)anthracene	--	--	--	--	
Benzo(a)pyrene	--	--	--	--	
Benzo(b)fluoranthene	--	--	--	--	

TABLE F-13
Marine Surface Water Ecological Screening Values (ESVs)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
Benzo(g,h,i)perylene	--	--	--	--	
Benzo(k)fluoranthene	--	--	--	--	
Chrysene	--	--	--	--	
Dibenz(a,h)anthracene	--	--	--	--	
Fluoranthene	11.0	ug/L	FCV	USEPA 1996a	
Fluorene	3.90	ug/L	Freshwater	USEPA 1996a	Secondary Chronic Value
Indeno(1,2,3-cd)pyrene	--	--	--	--	
Naphthalene	1.40	ug/L		Buchman 2008	Canadian Water Quality Guideline
Phenanthrene	8.30	ug/L	FCV	USEPA 1996a	
Pyrene	0.24	ug/L		USEPA 2006b	TRNCC (2001) value
Volatile Organic Compounds					
1,1,1-Trichloroethane	312	ug/L		USEPA 2001	USEPA Region 4 value
1,1,2,2-Tetrachloroethane	90.2	ug/L		USEPA 2001	USEPA Region 4 value
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	--	--	--	--	
1,1,2-Trichloroethane	550	ug/L		USEPA 2006b	TRNCC (2001) value
1,1-Dichloroethane	--	--	--	--	
1,1-Dichloroethene	2,240	ug/L		USEPA 2001	USEPA Region 4 value
1,2,3-Trichlorobenzene	--	--	--	--	
1,2,4-Trichlorobenzene	5.40	ug/L		Buchman 2008	Canadian Water Quality Guideline
1,2-Dibromo-3-chloropropane	--	--	--	--	
1,2-Dibromoethane	--	--	--	--	
1,2-Dichlorobenzene	42.0	ug/L		Buchman 2008	Canadian Water Quality Guideline
1,2-Dichloroethane	1,130	ug/L		USEPA 2001	USEPA Region 4 value
1,2-Dichloropropane	2,400	ug/L		USEPA 2001	USEPA Region 4 value
1,3-Dichlorobenzene	28.5	ug/L		USEPA 2001	USEPA Region 4 value
1,4-Dichlorobenzene	19.9	ug/L		USEPA 2001	USEPA Region 4 value
2-Butanone	--	--	--	--	
2-Hexanone	--	--	--	--	
4-Methyl-2-pentanone	123,000	ug/L		USEPA 2006b	TRNCC (2001) value
Acetone	564,000	ug/L		USEPA 2006b	TRNCC (2001) value
Benzene	110	ug/L		Buchman 2008	Canadian Water Quality Guideline
Bromochloromethane	--	--	--	--	
Bromodichloromethane	--	--	--	--	
Bromoform	640	ug/L		USEPA 2001	USEPA Region 4 value

TABLE F-13
Marine Surface Water Ecological Screening Values (ESVs)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
Bromomethane	120	ug/L		USEPA 2001	USEPA Region 4 value
Carbon disulfide	--	--	--	--	
Carbon tetrachloride	1,500	ug/L		USEPA 2001	USEPA Region 4 value
Chlorobenzene	25.0	ug/L		Buchman 2008	Canadian Water Quality Guideline
Chloroethane	--	--	--	--	
Chloroform	815	ug/L		USEPA 2001	USEPA Region 4 value
Chloromethane	2,700	ug/L		USEPA 2001	USEPA Region 4 value
cis-1,2-Dichloroethene	680	ug/L		USEPA 2006b	TRNCC (2001) value
cis-1,3-Dichloropropene	7.90	ug/L		USEPA 2001	USEPA Region 4 value
Cyclohexane	--	--	--	--	
Dibromochloromethane	--	--	--	--	
Dichlorodifluoromethane(Freon-12)	--	--	--	--	
Ethylbenzene	25.0	ug/L		Buchman 2008	Canadian Water Quality Guideline
Isopropylbenzene (Cumene)	--	--	--	--	
Methyl acetate	--	--	--	--	
Methylcyclohexane	--	--	--	--	
Methylene chloride	2,560	ug/L		USEPA 2001	USEPA Region 4 value
Methyl-tert-butyl ether (MTBE)	5,000	ug/L		Buchman 2008	Canadian Water Quality Guideline
m- and p-Xylene	--	--	--	--	
o-Xylene	--	--	--	--	
Styrene	910	ug/L		USEPA 2006b	TRNCC (2001) value
Tetrachloroethene	45.0	ug/L		USEPA 2001	USEPA Region 4 value
Toluene	215	ug/L		Buchman 2008	Canadian Water Quality Guideline
trans-1,2-Dichloroethene	680	ug/L		USEPA 2006b	TRNCC (2001) value
trans-1,3-Dichloropropene	7.90	ug/L		USEPA 2001	USEPA Region 4 value
Trichloroethene	1,940	ug/L		USEPA 2006b	TRNCC (2001) value
Trichlorofluoromethane(Freon-11)	--	--	--	--	
Vinyl chloride	--	--	--	--	
Xylene, total	--	--	--	--	

1 - AWQC: Ambient Water Quality Criterion; FCV: Final Chronic Value; FRV: Final Residue Value

TABLE F-14
Marine Sediment Ecological Screening Values (ESVs)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
Inorganics					
Aluminum	18,000	mg/kg	AET	Buchman 2008	Neanthes
Antimony	2.00	mg/kg	ER-L	Long and Morgan 1990	
Arsenic	8.20	mg/kg	ER-L	Long et al. 1995	
Barium	48.0	mg/kg	AET	Buchman 2008	Amphipod
Beryllium	--	--	--	--	
Cadmium	1.20	mg/kg	ER-L	Long et al. 1995	
Chromium	81.0	mg/kg	ER-L	Long et al. 1995	
Cobalt	10.0	mg/kg	AET	Buchman 2008	Neanthes
Copper	34.0	mg/kg	ER-L	Long et al. 1995	
Cyanide	--	--	--	--	
Iron	220,000	mg/kg	AET	Buchman 2008	Neanthes
Lead	46.7	mg/kg	ER-L	Long et al. 1995	
Manganese	260	mg/kg	AET	Buchman 2008	Neanthes
Mercury	0.15	mg/kg	ER-L	Long et al. 1995	
Nickel	20.9	mg/kg	ER-L	Long et al. 1995	
Selenium	1.00	mg/kg	AET	Buchman 2008	Amphipod
Silver	1.00	mg/kg	ER-L	Long et al. 1995	
Thallium	--	--	--	--	
Vanadium	57.0	mg/kg	AET	Buchman 2008	Neanthes
Zinc	150	mg/kg	ER-L	Long et al. 1995	
Pesticides					
4,4'-DDD	1.22	ug/kg	TEL	MacDonald 1994	
4,4'-DDE	2.20	ug/kg	ER-L	Long et al. 1995	
4,4'-DDT	1.19	ug/kg	TEL	MacDonald 1994	
Aldrin	9.50	ug/kg	AET	Buchman 2008	Amphipod/Echinoderm larvae
alpha-BHC	0.32	ug/kg	TEL	gamma-BHC value	
alpha-Chlordane	2.26	ug/kg	TEL	MacDonald 1994	
beta-BHC	0.32	ug/kg	TEL	gamma-BHC value	
delta-BHC	0.32	ug/kg	TEL	gamma-BHC value	
Dieldrin	0.715	ug/kg	TEL	MacDonald 1994	
Endosulfan I	--	--	--	--	
Endosulfan II	--	--	--	--	
Endosulfan sulfate	--	--	--	--	

TABLE F-14
Marine Sediment Ecological Screening Values (ESVs)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
Endrin	0.02	ug/kg	ER-L	Long and Morgan 1990	
Endrin aldehyde	0.02	ug/kg	ER-L	Endrin value	
Endrin ketone	0.02	ug/kg	ER-L	Endrin value	
gamma-BHC (Lindane)	0.32	ug/kg	TEL	MacDonald 1994	
gamma-Chlordane	2.26	ug/kg	TEL	MacDonald 1994	
Heptachlor	0.30	ug/kg	AET	Buchman 2008	Bivalve
Heptachlor epoxide	0.30	ug/kg	AET	Heptachlor value	Bivalve
Methoxychlor	--	--	--	--	
Toxaphene	--	--	--	--	
Polychlorinated Biphenyls					
Aroclor-1016	48.0	ug/kg	TEC	MacDonald et al. 2000	Concensus-based value
Aroclor-1221	48.0	ug/kg	TEC	MacDonald et al. 2000	Concensus-based value
Aroclor-1232	48.0	ug/kg	TEC	MacDonald et al. 2000	Concensus-based value
Aroclor-1242	48.0	ug/kg	TEC	MacDonald et al. 2000	Concensus-based value
Aroclor-1248	48.0	ug/kg	TEC	MacDonald et al. 2000	Concensus-based value
Aroclor-1254	63.3	ug/kg	ISQG	CCME 2002	
Aroclor-1260	48.0	ug/kg	TEC	MacDonald et al. 2000	Concensus-based value
Semivolatile Organic Compounds					
1-Methylnaphthalene	--	--	--	--	
2-Methylnaphthalene	70.0	ug/kg	ER-L	Long et al. 1995	
Acenaphthene	16.0	ug/kg	ER-L	Long et al. 1995	
Acenaphthylene	44.0	ug/kg	ER-L	Long et al. 1995	
Anthracene	85.3	ug/kg	ER-L	Long et al. 1995	
Benzo(a)anthracene	261	ug/kg	ER-L	Long et al. 1995	
Benzo(a)pyrene	430	ug/kg	ER-L	Long et al. 1995	
Benzo(b)fluoranthene	1,800	ug/kg	AET	Buchman 2008	Echinoderm larvae/infaunal
Benzo(g,h,i)perylene	670	ug/kg	AET	Buchman 2008	Microtox
Benzo(k)fluoranthene	1,800	ug/kg	AET	Buchman 2008	Echinoderm larvae/infaunal
Chrysene	384	ug/kg	ER-L	Long et al. 1995	
Dibenz(a,h)anthracene	63.4	ug/kg	ER-L	Long et al. 1995	
Fluoranthene	600	ug/kg	ER-L	Long et al. 1995	
Fluorene	19.0	ug/kg	ER-L	Long et al. 1995	
Indeno(1,2,3-cd)pyrene	600	ug/kg	AET	Buchman 2008	Microtox
Naphthalene	160	ug/kg	ER-L	Long et al. 1995	

TABLE F-14
Marine Sediment Ecological Screening Values (ESVs)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
PAH (total)	4,022	ug/kg	ER-L	Long et al. 1995	
PAH (HMW)	1,700	ug/kg	ER-L	Long et al. 1995	
PAH (LMW)	552	ug/kg	ER-L	Long et al. 1995	
Phenanthrene	240	ug/kg	ER-L	Long et al. 1995	
Pyrene	665	ug/kg	ER-L	Long et al. 1995	
Volatile Organic Compounds					
1,1,1-Trichloroethane	--	--	--	--	
1,1,2,2-Tetrachloroethane	--	--	--	--	
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	--	--	--	--	
1,1,2-Trichloroethane	--	--	--	--	
1,1-Dichloroethane	--	--	--	--	
1,1-Dichloroethene	--	--	--	--	
1,2,3-Trichlorobenzene	--	--	--	--	
1,2,4-Trichlorobenzene	4.80	ug/kg	AET	Buchman 2008	Echinoderm larvae
1,2-Dibromo-3-chloropropane	--	--	--	--	
1,2-Dibromoethane	--	--	--	--	
1,2-Dichlorobenzene	13.0	ug/kg	AET	Buchman 2008	Neanthes
1,2-Dichloroethane	--	--	--	--	
1,2-Dichloropropane	--	--	--	--	
1,3-Dichlorobenzene	--	--	--	--	
1,4-Dichlorobenzene	110	ug/kg	AET	Buchman 2008	Infaunal community/Microtox
2-Butanone	--	--	--	--	
2-Hexanone	--	--	--	--	
4-Methyl-2-pentanone	--	--	--	--	
Acetone	--	--	--	--	
Benzene	--	--	--	--	
Bromochloromethane	--	--	--	--	
Bromodichloromethane	--	--	--	--	
Bromoform	--	--	--	--	
Bromomethane	--	--	--	--	
Carbon disulfide	--	--	--	--	
Carbon tetrachloride	--	--	--	--	
Chlorobenzene	--	--	--	--	
Chloroethane	--	--	--	--	

TABLE F-14
Marine Sediment Ecological Screening Values (ESVs)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
Chloroform	--	--	--	--	
Chloromethane	--	--	--	--	
cis-1,2-Dichloroethene	--	--	--	--	
cis-1,3-Dichloropropene	--	--	--	--	
Cyclohexane	--	--	--	--	
Dibromochloromethane	--	--	--	--	
Dichlorodifluoromethane(Freon-12)	--	--	--	--	
Ethylbenzene	4.00	ug/kg	AET	Buchman 2008	Echinoderm larvae/bioassay
Isopropylbenzene (Cumene)	--	--	--	--	
Methyl acetate	--	--	--	--	
Methylcyclohexane	--	--	--	--	
Methylene chloride	--	--	--	--	
Methyl-tert-butyl ether (MTBE)	--	--	--	--	
m- and p-Xylene	--	--	--	--	
o-Xylene	--	--	--	--	
Styrene	--	--	--	--	
Tetrachloroethene	57.0	ug/kg	AET	Buchman 2008	Infaunal community
Toluene	--	--	--	--	
trans-1,2-Dichloroethene	--	--	--	--	
trans-1,3-Dichloropropene	--	--	--	--	
Trichloroethene	41.0	ug/kg	AET	Buchman 2008	Neanthes
Trichlorofluoromethane(Freon-11)	--	--	--	--	
Vinyl chloride	--	--	--	--	
Xylene, total	4.00	ug/kg	AET	Buchman 2008	Bivalve/larval bioassay

1 - AET: Apparent Effect Threshold; ER-L: Effects Range-Low; ISQG: Interim Sediment Quality Guideline; TEC: Threshold Effect Concentration; TEL: Threshold Effect Level

TABLE F-15
Marine Sediment Values Based on Equilibrium Partitioning (EqP)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	EqP Value	Units	TOC (%)	Reference	Comments
Pesticides					
alpha-BHC	1,360	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
beta-BHC	1,360	ug/kg	1.00	alpha-BHC value	
delta-BHC	1,360	ug/kg	1.00	alpha-BHC value	
Dieldrin	95.0	ug/kg	1.00	USEPA 1996a	
Endosulfan I	0.51	ug/kg	1.00	USEPA 2008b	Conventional model
Endosulfan II	2.40	ug/kg	1.00	USEPA 2008b	Conventional model
Endosulfan sulfate	0.36	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Endrin	3.50	ug/kg	1.00	USEPA 1996a	
Endrin aldehyde	3.50	ug/kg	1.00	Endrin value	
Endrin ketone	3.50	ug/kg	1.00	Endrin value	
gamma-BHC (Lindane)	1,360	ug/kg	1.00	alpha-BHC value	
Methoxychlor	29.6	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Toxaphene	540	ug/kg	1.00	USEPA 2008b	Conventional model
Polychlorinated Biphenyls					
Aroclor-1016	120	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Aroclor-1221	120	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Aroclor-1232	120	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Aroclor-1242	120	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Aroclor-1248	120	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Aroclor-1254	120	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Aroclor-1260	120	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Semivolatile Organic Compounds					
2-Methylnaphthalene	380	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Acenaphthene	1,100	ug/kg	1.00	USEPA 1996a	
Acenaphthylene	660	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Anthracene	2,200	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Benzo(a)anthracene	1,100	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Benzo(a)pyrene	990	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Benzo(b)fluoranthene	2,300	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Benzo(g,h,i)perylene	310	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Benzo(k)fluoranthene	2,300	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Chrysene	1,100	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Dibenz(a,h)anthracene	120	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards

TABLE F-15
Marine Sediment Values Based on Equilibrium Partitioning (EqP)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	EqP Value	Units	TOC (%)	Reference	Comments
Fluoranthene	1,400	ug/kg	1.00	USEPA 1996a	
Fluorene	230	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Indeno(1,2,3-cd)pyrene	340	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Naphthalene	990	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
PAH (total)	2,900	ug/kg	1.00	USEPA 2006b	Threshold Effect Concentration
PAH (HMW)	9,600	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
PAH (LMW)	3,700	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Phenanthrene	1,100	ug/kg	1.00	USEPA 1996a	
Pyrene	10,000	ug/kg	1.00	Washington State 1995	Sediment Management (Quality) Standards
Volatile Organic Compounds					
1,1,1-Trichloroethane	856	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
1,1,2,2-Tetrachloroethane	202	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
1,1,2-Trichloroethane	570	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
1,1-Dichloroethene	2,780	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
1,2,4-Trichlorobenzene	473	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
1,2-Dichlorobenzene	989	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
1,3-Dichlorobenzene	842	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
1,4-Dichlorobenzene	458	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Benzene	137	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Bromoform	1,310	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Carbon tetrachloride	7,245	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Chlorobenzene	162	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
cis-1,3-Dichloropropene	7.31	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Ethylbenzene	305	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Styrene	7,070	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Tetrachloroethene	190	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Toluene	1,085	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
trans-1,3-Dichloropropene	7.31	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value
Trichloroethene	8,955	ug/kg	1.00	USEPA 2006b	USEPA Region 3 value

TABLE F-16
Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type/Receptor	Reference	Comments
Inorganics					
Aluminum	pH < 5.5	--	Eco-SSL	USEPA 2003a	
Antimony	78.0	mg/kg	Eco-SSL - Invertebrate	USEPA 2005a	
Arsenic	18.0	mg/kg	Eco-SSL - Plant	USEPA 2005b	
Barium	330	mg/kg	Eco-SSL - Invertebrate	USEPA 2005c	
Beryllium	40.0	mg/kg	Eco-SSL - Invertebrate	USEPA 2005d	
Cadmium	32.0	mg/kg	Eco-SSL - Plant	USEPA 2005e	
Chromium	64.0	mg/kg	Soil Quality Guideline	CCME 2007	
Cobalt	13.0	mg/kg	Eco-SSL - Plant	USEPA 2005f	
Copper	70.0	mg/kg	Eco-SSL - Plant	USEPA 2007a	
Cyanide	15.8	mg/kg		MHSPE 2000	Geometric mean of target and intervention values (complex)
Iron	5 < pH > 8	--	Eco-SSL	USEPA 2003b	
Lead	120	mg/kg	Eco-SSL - Plant	USEPA 2005g	
Manganese	220	mg/kg	Eco-SSL - Plant	USEPA 2007b	
Mercury	0.10	mg/kg	Invertebrate	Efroymson et al. 1997b	
Nickel	38.0	mg/kg	Eco-SSL - Plant	USEPA 2007c	
Selenium	0.52	mg/kg	Eco-SSL - Plant	USEPA 2007d	
Silver	560	mg/kg	Eco-SSL - Plant	USEPA 2006a	
Thallium	1.00	mg/kg	Plant	Efroymson et al. 1997a	
Vanadium	130	mg/kg	Soil Quality Guideline	CCME 2007	
Zinc	120	mg/kg	Eco-SSL - Invertebrate	USEPA 2007e	
Pesticides					
4,4'-DDD	583	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
4,4'-DDE	114	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
4,4'-DDT	100	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
Aldrin	3.63	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
alpha-BHC	226	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
alpha-Chlordane	11.0	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
beta-BHC	342	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
delta-BHC	226	ug/kg		alpha-BHC value	
Dieldrin	10.5	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
Endosulfan I	6.32	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
Endosulfan II	6.32	ug/kg		MHSPE 2000	Geometric mean of target and intervention values

TABLE F-16
Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type/Receptor	Reference	Comments
Endosulfan sulfate	6.32	ug/kg		Endosulfan value	
Endrin	1.95	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
Endrin aldehyde	1.95	ug/kg		Endrin value	
Endrin ketone	1.95	ug/kg		Endrin value	
gamma-BHC (Lindane)	7.75	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
gamma-Chlordane	11.0	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
Heptachlor	52.9	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
Heptachlor epoxide	52.9	ug/kg		Heptachlor value	
Methoxychlor	500	ug/kg		Beyer 1990	B value ("moderate soil contamination")
Toxaphene	500	ug/kg		Beyer 1990	B value ("moderate soil contamination")
Polychlorinated Biphenyls					
Aroclor-1016	8,000	ug/kg	Plant	Efroymson et al. 1997a	Lowest EC50 (40,000); UF of 5
Aroclor-1221	8,000	ug/kg	Plant	Efroymson et al. 1997a	Lowest EC50 (40,000); UF of 5
Aroclor-1232	8,000	ug/kg	Plant	Efroymson et al. 1997a	Lowest EC50 (40,000); UF of 5
Aroclor-1242	8,000	ug/kg	Plant	Efroymson et al. 1997a	Lowest EC50 (40,000); UF of 5
Aroclor-1248	8,000	ug/kg	Plant	Efroymson et al. 1997a	Lowest EC50 (40,000); UF of 5
Aroclor-1254	8,000	ug/kg	Plant	Efroymson et al. 1997a	Lowest EC50 (40,000); UF of 5
Aroclor-1260	8,000	ug/kg	Plant	Efroymson et al. 1997a	Lowest EC50 (40,000); UF of 5
Semivolatile Organic Compounds					
1,1-Biphenyl	13,600	ug/kg	Plant	Efroymson et al. 1997a	EC50 (68,000); UF of 5
1,2,3-Trichlorobenzene	1,150	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 115,000; UF of 100
1,2,4,5-Tetrachlorobenzene	1,000	ug/kg		Beyer 1990	B value ("moderate soil contamination")
1,2,4-Trichlorobenzene	1,270	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 127,000; UF of 100
1,2-Dichlorobenzene	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
1,3-Dichlorobenzene	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
1,4-Dichlorobenzene	1,280	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 128,000; UF of 100
1,4-Dioxane	--	--	--	--	
2,2'-Oxybis(1-chloropropane	--	--	--	--	
2,3,4,6-Tetrachlorophenol	500	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
2,4,5-Trichlorophenol	1,350	ug/kg	Plant	Efroymson et al. 1997a	NOEC
2,4,6-Trichlorophenol	580	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 58,000; UF of 100

TABLE F-16
Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type/Receptor	Reference	Comments
2,4-Dichlorophenol	500	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
2,4-Dimethylphenol	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
2,4-Dinitrophenol	20,000	ug/kg	Plant	Efroymson et al. 1997a	NOEC
2,4-Dinitrotoluene	11,000	ug/kg	Plant/Invertebrate	NRCC 2006	
2,6-Dinitrotoluene	8,500	ug/kg	Plant/Invertebrate	NRCC 2006	
2-Chloronaphthalene	see PAHs				
2-Chlorophenol	500	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
2-Methylnaphthalene	see PAHs				
2-Methylphenol	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
2-Nitroaniline	--	--	--	--	
2-Nitrophenol	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
3- and 4-Methylphenol	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
3,3'-Dichlorobenzidine	--	--	--	--	
3-Nitroaniline	--	--	--	--	
4,6-Dinitro-2-methylphenol	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
4-Bromophenyl-phenylether	--	--	--	--	
4-Chloro-3-methylphenol	500	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
4-Chloroaniline	500	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
4-Chlorophenyl-phenylether	--	--	--	--	
4-Methylphenol	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
4-Nitroaniline	--	--	--	--	
4-Nitrophenol	380	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 38,000; UF of 100
Acenaphthene	see PAHs				
Acenaphthylene	see PAHs				
Acetophenone	--	--	--	--	

TABLE F-16
Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type/Receptor	Reference	Comments
Anthracene	see PAHs				
Atrazine	11.9	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
Benzaldehyde	--	--	--	--	
Benzo(a)anthracene	see PAHs				
Benzo(a)pyrene	see PAHs				
Benzo(b)fluoranthene	see PAHs				
Benzo(g,h,i)perylene	see PAHs				
Benzo(k)fluoranthene	see PAHs				
Benzoic acid	--	--	--	--	
Benzyl alcohol	--	--	--	--	
bis(2-Chloroethoxy)methane	--	--	--	--	
bis(2-Chloroethyl)ether	--	--	--	--	
bis(2-Ethylhexyl)phthalate	30,000	ug/kg	Plant	CCME 2007	Interim Remediation Criteria (IRC) for residential/parkland
Butylbenzylphthalate	30,000	ug/kg	Plant	CCME 2007	Interim Remediation Criteria (IRC) for residential/parkland
Caprolactam	--	--	--	--	
Carbazole	--	--	--	--	
Chrysene	see PAHs				
Dibenz(a,h)anthracene	see PAHs				
Dibenzofuran	--	--	--	--	
Diethylphthalate	26,800	ug/kg	Plant	Efroymson et al. 1997a	EC50 (134,000); UF of 5
Dimethyl phthalate	10,640	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 1,064,000; UF of 100
Di-n-butylphthalate	40,000	ug/kg	Plant	Efroymson et al. 1997a	LOEC (200,000); UF of 5
Di-n-octylphthalate	30,000	ug/kg	Plant	CCME 2007	Interim Remediation Criteria (IRC) for residential/parkland
Fluoranthene	see PAHs				
Fluorene	see PAHs				
Hexachlorobenzene	1,000	ug/kg		Beyer 1990	B value ("moderate soil contamination")
Hexachlorobutadiene	--	--	--	--	
Hexachlorocyclopentadiene	2,000	ug/kg	Plant	Efroymson et al. 1997a	LOEC (10,000); UF of 5
Hexachloroethane	--	--	--	--	
Indeno(1,2,3-cd)pyrene	see PAHs				
Isophorone	--	--	--	--	
Naphthalene	see PAHs				
Nitrobenzene	2,260	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 226,000; UF of 100
n-Nitroso-di-n-propylamine	--	--	--	--	

TABLE F-16
Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type/Receptor	Reference	Comments
n-Nitrosodiphenylamine	1,090	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 109,000; UF of 100
PAH (total)	--	--	--	--	
PAH (HMW)	18,000	ug/kg	Eco-SSL - Invertebrate	USEPA 2007i	
PAH (LMW)	29,000	ug/kg	Eco-SSL - Invertebrate	USEPA 2007i	
Pentachlorophenol	5,000	ug/kg	Eco-SSL - Plant	USEPA 2007h	
Phenanthrene	see PAHs				
Phenol	1,880	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 188,000; UF of 100
Pyrene	see PAHs				
TPH-diesel range	--	--	--	--	
TPH-gas range	--	--	--	--	
TPH-oil range	--	--	--	--	
Volatile Organic Compounds					
1,1,1-Trichloroethane	1,025	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
1,1,2,2-Tetrachloroethane	5,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	--	--	--	--	
1,1,2-Trichloroethane	2,000	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
1,1-Dichloroethane	548	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
1,1-Dichloroethene	173	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
1,2,3-Trichlorobenzene	1,150	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 115,000; UF of 100
1,2,4-Trichlorobenzene	1,270	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 127,000; UF of 100
1,2-Dibromo-3-chloropropan	--	--	--	--	
1,2-Dibromoethane	300	ug/kg	Plant	CCME 2007	Interim Remediation Criteria (IRC) for residential/parkland
1,2-Dichlorobenzene	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
1,2-Dichloroethane	2,190	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
1,2-Dichloropropane	38,800	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 3,880,000; UF of 100
1,3-Dichlorobenzene	1,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
1,4-Dichlorobenzene	1,280	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 128,000; UF of 100
2-Butanone	--	--	--	--	
2-Hexanone	--	--	--	--	
4-Methyl-2-pentanone	--	--	--	--	

TABLE F-16
Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type/Receptor	Reference	Comments
Acetone	--	--	--	--	
Benzene	6.80	ug/kg	Soil Quality Guideline	CCME 2007	
Bromochloromethane	--	--	--	--	
Bromodichloromethane	--	--	--	--	
Bromoform	300	ug/kg	Plant	CCME 2007	Interim Remediation Criteria (IRC) for residential/parkland
Bromomethane	--	--	--	--	
Carbon disulfide	--	--	--	--	
Carbon tetrachloride	3,400	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
Chlorobenzene	2,400	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 240,000; UF of 100
Chloroethane	5,000	ug/kg		CCME 2007	Interim Remediation Criteria (IRC) for residential/parkland
Chloroform	1,844	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
Chloromethane	5,000	ug/kg		CCME 2007	Interim Remediation Criteria (IRC) for residential/parkland
cis-1,2-Dichloroethene	447	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
cis-1,3-Dichloropropene	5,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
Cyclohexane	6,000	ug/kg		Beyer 1990	B value ("moderate soil contamination")
Dibromochloromethane	--	--	--	--	
Dichlorodifluoromethane(Fre	--	--	--	--	
Ethylbenzene	18.0	ug/kg	Soil Quality Guideline	CCME 2007	
Isopropylbenzene (Cumene)	--	--	--	--	
Methyl acetate	--	--	--	--	
Methylcyclohexane	--	--	--	--	
Methylene chloride	1,250	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
Methyl-tert-butyl ether (MTB	--	--	--	--	
m- and p-Xylene	2,400	ug/kg	Soil Quality Guideline	CCME 2007	Xylenes
o-Xylene	2,400	ug/kg	Soil Quality Guideline	CCME 2007	Xylenes
Styrene	64,000	ug/kg	Plant	Efroymson et al. 1997a	EC50 (320,000); UF of 5
Tetrachloroethene	200	ug/kg	Soil Quality Guideline	CCME 2007	
Toluene	40,000	ug/kg	Plant	Efroymson et al. 1997a	EC50 (200,000); UF of 5
trans-1,2-Dichloroethene	447	ug/kg		MHSPE 2000	Geometric mean of target and intervention values
trans-1,3-Dichloropropene	5,000	ug/kg		CCME 2007; Beyer 1990	Interim Remediation Criteria (IRC) for residential/parkland; B value ("moderate soil contamination")
Trichloroethene	10.0	ug/kg	Soil Quality Guideline	CCME 2007	
Trichlorofluoromethane(Fred	--	--	--	--	

TABLE F-16
Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	ESV	Units	Type/Receptor	Reference	Comments
Vinyl chloride	412	ug/kg		MHSPE 2000; 2001	Geometric mean of target and serious risk concentration values
Xylene, total	2,400	ug/kg	Soil Quality Guideline	CCME 2007	
Explosives					
1,3,5-Trinitrobenzene	--	--	--	--	
1,3-Dinitrobenzene	--	--	--	--	
2,4,6-Trinitrotoluene	10,000	ug/kg	Plant	Talmage et al. 1999	
2,4-Dinitrotoluene	11,000	ug/kg	Plant/Invertebrate	NRCC 2006	
2,6-Dinitrotoluene	8,500	ug/kg	Plant/Invertebrate	NRCC 2006	
2-Amino-4,6-dinitrotoluene	80,000	ug/kg	Plant	Talmage et al. 1999	
2-Nitrotoluene	--	--	--	--	
3,5-Dinitroaniline	--	--	--	--	
3-Nitrotoluene	--	--	--	--	
4-Amino-2,6-dinitrotoluene	--	--	--	--	
4-Nitrotoluene	--	--	--	--	
HMX	10,000	ug/kg	Invertebrate	Talmage et al. 1999	
Nitrobenzene	2,260	ug/kg	Invertebrate	Efroymson et al. 1997b	LC50 of 226,000; UF of 100
Nitroglycerine	--	--	--	--	
Nitroguanidine	--	--	--	--	
Perchlorate	1,000	ug/kg	Invertebrate	USEPA 2002	
PETN	--	--	--	--	
RDX	10,000	ug/kg	Invertebrate	Talmage et al. 1999	
Tetryl	10,000	ug/kg	Plant	Talmage et al. 1999	

TABLE F-17
Uncertainty Factors
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Convert From	Convert To	Uncertainty Factor
Chronic NOAEL or NOEC	Chronic NOAEL or NOEC	1
Chronic LOAEL or LOEC	Chronic NOAEL or NOEC	5
Chronic NOAEL or NOEC	Chronic LOAEL or LOEC	5
Subchronic NOAEL or NOEC	Chronic NOAEL or NOEC	10
Subchronic LOAEL or LOEC	Chronic NOAEL or NOEC	20
Acute NOAEL or NOEC	Chronic NOAEL or NOEC	30
Acute LOAEL or LOEC	Chronic NOAEL or NOEC	50
LD50 or LC50	Chronic NOAEL or NOEC	100

Uncertainty factors from Wentsel et al. (1996)
Durations are defined as follows (USEPA 1999; Sample et al. 1996):
- Acute: <3 days (plants, invertebrates) and <14 days (fish, birds, mammals)
- Subchronic: 3 - 6 days (plants, invertebrates) and 14 - 90 days (fish, birds, mammals)
- Chronic: >7 days (plants, invertebrates) and >90 days or during critical life stage (fish, birds, mammals)

TABLE F-18
Ingestion-Based Toxicity Reference Values (TRVs) for Mammals
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Chemical Form	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	Reference	NOAEL (mg/kg/d)	Reference	MATC (mg/kg/d)
Metals											
Arsenic	Arsenite (As+3)	mouse	0.03	3 generations	oral in water/food	reproduction	1.26	Sample et al. 1996	0.25 a	--	0.56
Cadmium	--	rat	--	2 weeks	oral in water	survival, growth, reproduction	7.70	USEPA 2005e	0.77	USEPA 2005e	2.43
Chromium	Cr+3	multiple	--	--	oral	survival, growth, reproduction	12.0 b	--	2.40	USEPA 2008a	5.37
Copper	--	pig	--	4 weeks	oral in diet	survival, growth, reproduction	9.34	USEPA 2007a	5.60	USEPA 2007a	7.23
Lead	--	rat	--	7 weeks	oral in water	survival, growth, reproduction	8.90	USEPA 2005g	4.70	USEPA 2005g	6.47
Mercury	Methyl mercury chloride	rat	0.35	3 generations	oral in diet	reproduction	0.160	Sample et al. 1996	0.032	Sample et al. 1996	0.072
Nickel	--	mouse	--	35 days	oral	survival, growth, reproduction	3.40	USEPA 2007c	1.70	USEPA 2007c	2.40
Selenium	Potassium selenate	rat	0.35	1 year	oral in water	reproduction	0.33	Sample et al. 1996	0.20	Sample et al. 1996	0.26
Silver	--	pig	--	40 days	oral in diet	survival, growth, reproduction	60.2	USEPA 2006a	12.0 a	--	26.9
Zinc	--	multiple	--	--	oral	survival, growth, reproduction	377 b	--	75.4	USEPA 2007e	169
Pesticides											
4,4'-DDD	--	rat	--	15 days	oral (gavage)	survival, growth, reproduction	0.735	USEPA 2007f	0.147	USEPA 2007f	0.329
4,4'-DDE	--	rat	--	15 days	oral (gavage)	survival, growth, reproduction	0.735	USEPA 2007f	0.147	USEPA 2007f	0.329
4,4'-DDT	--	rat	--	15 days	oral (gavage)	survival, growth, reproduction	0.735	USEPA 2007f	0.147	USEPA 2007f	0.329
Aldrin	--	rat	0.35	3 generations	oral in diet	reproduction	1.00	Sample et al. 1996	0.20	Sample et al. 1996	0.45
alpha-BHC	Mixed isomers	rat	0.35	4 generations	oral in diet	reproduction	3.20	Sample et al. 1996	1.60	Sample et al. 1996	2.26
alpha-Chlordane	Chlordane	mouse	0.03	6 generations	oral in diet	reproduction	9.16	Sample et al. 1996	4.58	Sample et al. 1996	6.48
beta-BHC	Mixed isomers	rat	0.35	4 generations	oral in diet	reproduction	3.20	Sample et al. 1996	1.60	Sample et al. 1996	2.26
delta-BHC	Mixed isomers	rat	0.35	4 generations	oral in diet	reproduction	3.20	Sample et al. 1996	1.60	Sample et al. 1996	2.26
Dieldrin	--	rat	--	750 days	oral in diet	survival, growth, reproduction	0.030	USEPA 2007g	0.015	USEPA 2007g	0.021
Endosulfan I	--	rat	0.35	30 days	oral (gavage)	fertility	0.75 b	--	0.15	Sample et al. 1996	0.34
Endosulfan II	--	rat	0.35	30 days	oral (gavage)	fertility	0.75 b	--	0.15	Sample et al. 1996	0.34
Endrin	--	mouse	0.03	120 days	oral in diet	reproduction	0.92	Sample et al. 1996	0.18 a	--	0.41
gamma-BHC (Lindane)	--	rat	0.35	3 generations	oral in diet	reproduction	40.0 b	--	8.00	Sample et al. 1996	17.9
gamma-Chlordane	Chlordane	mouse	0.03	6 generations	oral in diet	reproduction	9.16	Sample et al. 1996	4.58	Sample et al. 1996	6.48
Heptachlor	--	mink	1.00	181 days	oral in diet	reproduction	1.00	Sample et al. 1996	0.20 a	--	0.45
Heptachlor epoxide	--	mink	1.00	181 days	oral in diet	reproduction	1.00	Heptachlor value	0.20 a	--	0.45
Methoxychlor	--	rat	0.35	11 months	oral in diet	reproduction	8.00	Sample et al. 1996	4.00	Sample et al. 1996	5.66
Toxaphene	--	rat	0.35	3 generations	oral in diet	reproduction	40.0 b	--	8.00	Sample et al. 1996	17.9

TABLE F-18
Ingestion-Based Toxicity Reference Values (TRVs) for Mammals
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Chemical Form	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	Reference	NOAEL (mg/kg/d)	Reference	MATC (mg/kg/d)
Polychlorinated Biphenyls											
Aroclor-1016	--	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	Aroclor-1254 value	0.14 a	Aroclor-1254 value	0.30
Aroclor-1221	--	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	Aroclor-1254 value	0.14 a	Aroclor-1254 value	0.30
Aroclor-1232	--	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	Aroclor-1254 value	0.14 a	Aroclor-1254 value	0.30
Aroclor-1242	--	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	Aroclor-1254 value	0.14 a	Aroclor-1254 value	0.30
Aroclor-1248	--	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	Aroclor-1254 value	0.14 a	Aroclor-1254 value	0.30
Aroclor-1254	--	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	Sample et al. 1996	0.14 a	--	0.30
Aroclor-1260	--	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	Aroclor-1254 value	0.14 a	Aroclor-1254 value	0.30
Volatile and Semivolatile Organic Compounds											
1,1,2,2-Tetrachloroethane	--	rat	0.35	78 weeks	oral (gavage)	reproduction	380 b	--	76.0	ATSDR 2008	170
1,2,4-Trichlorobenzene	--	rat	0.35	3 generations	oral in water	reproduction	106	Coulston and Kolbye 1994	53.0	Coulston and Kolbye 1994	75.0
1,2-Dichlorobenzene	--	rat	0.35	chronic	oral	liver/kidney	429 b	--	85.7	Coulston and Kolbye 1994	192
1,3-Dichlorobenzene	--	rat	0.35	chronic	oral	liver/kidney	429 b	--	85.7	Value for 1,2-Dichlorobenzene	192
1,4-Dichlorobenzene	--	rat	0.35	2 generations	oral (gavage)	developmental	90.0	ATSDR 2006	30.0	ATSDR 2006	52.0
Acenaphthene	--	rat	--	6 weeks	oral in diet	survival, growth, reproduction	328	USEPA 2007i	65.6	USEPA 2007i	147
Acenaphthylene	--	rat	--	6 weeks	oral in diet	survival, growth, reproduction	328	USEPA 2007i	65.6	USEPA 2007i	147
Anthracene	--	rat	--	6 weeks	oral in diet	survival, growth, reproduction	328	USEPA 2007i	65.6	USEPA 2007i	147
Benzo(a)anthracene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37
Benzo(a)pyrene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37
Benzo(b)fluoranthene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37
Benzo(g,h,i)perylene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37
Benzo(k)fluoranthene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37
Chrysene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37
Dibenz(a,h)anthracene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37
Fluoranthene	--	rat	--	6 weeks	oral in diet	survival, growth, reproduction	328	USEPA 2007i	65.6	USEPA 2007i	147
Fluorene	--	rat	--	6 weeks	oral in diet	survival, growth, reproduction	328	USEPA 2007i	65.6	USEPA 2007i	147
Indeno(1,2,3-cd)pyrene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37
Phenanthrene	--	rat	--	6 weeks	oral in diet	survival, growth, reproduction	328	USEPA 2007i	65.6	USEPA 2007i	147
Pyrene	--	mouse	--	65 weeks	oral in diet	survival, growth, reproduction	3.07	USEPA 2007i	0.62	USEPA 2007i	1.37

[a] Uncertainty factor of 5 applied to LOAEL
[u] Uncertainty factor of 5 applied to NOAEL

TABLE F-19
Ingestion-Based Toxicity Reference Values (TRVs) for Birds
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Chemical Form	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)		Reference	NOAEL (mg/kg/d)		Reference	MATC (mg/kg/d)	Green Heron	Spotted Sandpiper
Metals															
Arsenic	Sodium arsenite	mallard	1.00	128 days	oral in diet	survival	12.8		Sample et al. 1996	5.14		Sample et al. 1996	8.12	X	X
Cadmium	--	multiple	--	--	oral in diet	survival, growth,reproduction	7.35	b	--	1.47		USEPA 2005e	3.29	X	X
Chromium	Cr+3	multiple	--	--	oral in diet	survival, growth,reproduction	13.3	b	--	2.66		USEPA 2008a	5.95	X	X
Copper	--	chicken	--	84 days	oral in diet	survival, growth,reproduction	12.1		USEPA 2007a	4.05		USEPA 2007a	7.00	X	X
Lead	Metallic	American kestrel	0.13	7 months	oral in diet	reproduction	19.3	b	--	3.85		Sample et al. 1996	8.61	X	X
Mercury	Methyl mercury	mallard	1.00	3 generations	oral in diet	reproduction	0.078		USEPA 1997b	0.026		USEPA 1997b	0.045	X	X
Nickel	--	multiple	--	--	oral in diet	survival, growth,reproduction	33.6	b	--	6.71		USEPA 2007c	15.0	X	X
Selenium	Selanomethionine	mallard	1.00	100 days	oral in diet	reproduction	0.80		Sample et al. 1996	0.40		Sample et al. 1996	0.57		X
Selenium	Selanomethionine	black-crowned night-heron	0.88	94 days	oral in diet	reproduction	9.00	b	--	1.80		Sample et al. 1996	4.02	X	
Silver	--	turkey	--	5 weeks	oral in diet	survival, growth	20.2		USEPA 2006a	4.04	a	--	9.03	X	X
Zinc	--	multiple	--	--	oral in diet	survival, growth,reproduction	331	b	--	66.1		USEPA 2007e	148	X	X
Pesticides															
4,4'-DDD	--	mallard	1.00	2 years	oral in diet	reproduction	0.60		DDE value	0.12		DDE value	0.27		X
4,4'-DDD	--	bald eagle	--	112 days	oral in diet	survival	3.00		DDT value	0.30		DDT value	0.95	X	
4,4'-DDE	--	mallard	1.00	2 years	oral in diet	reproduction	0.60		USEPA 1995b	0.12		USEPA 1995b	0.27		X
4,4'-DDE	--	bald eagle	--	112 days	oral in diet	survival	3.00		DDT value	0.30		DDT value	0.95	X	
4,4'-DDT	--	mallard	1.00	2 years	oral in diet	reproduction	1.50		USEPA 1995b	0.60		USEPA 1995b	0.95		X
4,4'-DDT	--	bald eagle	--	112 days	oral in diet	survival	3.00		USEPA 1995b	0.30		USEPA 1995b	0.95	X	
Aldrin	--	mallard	1.00	5 days	oral in diet	survival	0.775	b	--	0.155	e	Hill et al. 1975	0.347	X	X
alpha-BHC	Mixed isomers	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25		Sample et al. 1996	0.56		Sample et al. 1996	1.13	X	X
alpha-Chlordane	--	mallard	1.00	not specified	oral in diet	reproduction	4.00	b	--	0.80		Wiemeyer 1996	1.79	X	X
beta-BHC	Mixed isomers	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25		Sample et al. 1996	0.56		Sample et al. 1996	1.13	X	X
delta-BHC	Mixed isomers	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25		Sample et al. 1996	0.56		Sample et al. 1996	1.13	X	X
Dieldrin	--	mallard	--	24 days	oral in diet	survival, growth,reproduction	3.78		USEPA 2007g	0.071		USEPA 2007g	0.52	X	X
Endosulfan I	--	gray partridge	0.40	4 weeks	oral in diet	reproduction	50.0	b	--	10.0		Sample et al. 1996	22.4	X	X
Endosulfan II	--	gray partridge	0.40	4 weeks	oral in diet	reproduction	50.0	b	--	10.0		Sample et al. 1996	22.4	X	X
Endrin	--	mallard	1.15	>200 days	oral in diet	reproduction	1.50	b	--	0.30		Sample et al. 1996	0.67	X	X
gamma-BHC (Lindane)	--	mallard	1.00	8 weeks	oral (intubation)	reproduction	20.0		Sample et al. 1996	4.00	a	--	8.94	X	X
gamma-Chlordane	--	mallard	1.00	not specified	oral in diet	reproduction	4.00	b	--	0.80		Wiemeyer 1996	1.79	X	X
Heptachlor	--	mallard	1.00	5 days	oral in diet	survival	2.40	b	--	0.48	e	Hill et al. 1975	1.07	X	X
Heptachlor epoxide	--	mallard	1.00	5 days	oral in diet	survival	2.40	b	--	0.48	e	Heptachlor value	1.07	X	X
Methoxychlor	--	chicken	1.50	16 weeks	oral in diet	reproduction	1,775	b	--	355		Wiemeyer 1996	794	X	X
Toxaphene	--	American black duck	1.00	2 seasons	oral in diet	reproduction	5.00		Wiemeyer 1996	1.00		Wiemeyer 1996	2.24	X	X
Polychlorinated Biphenyls															
Aroclor-1016	--	mallard	1.00	1 month	oral in diet	reproduction	7.50	b	Aroclor-1254 value	1.50		Aroclor-1254 value	3.35	X	X
Aroclor-1221	--	mallard	1.00	1 month	oral in diet	reproduction	7.50	b	Aroclor-1254 value	1.50		Aroclor-1254 value	3.35	X	X
Aroclor-1232	--	mallard	1.00	1 month	oral in diet	reproduction	7.50	b	Aroclor-1254 value	1.50		Aroclor-1254 value	3.35	X	X
Aroclor-1242	--	mallard	1.00	1 month	oral in diet	reproduction	7.50	b	Aroclor-1254 value	1.50		Aroclor-1254 value	3.35	X	X
Aroclor-1248	--	mallard	1.00	1 month	oral in diet	reproduction	7.50	b	Aroclor-1254 value	1.50		Aroclor-1254 value	3.35	X	X
Aroclor-1254	--	mallard	1.00	1 month	oral in diet	reproduction	7.50	b	--	1.50		USEPA 1995b	3.35	X	X
Aroclor-1260	--	mallard	1.00	1 month	oral in diet	reproduction	7.50	b	Aroclor-1254 value	1.50		Aroclor-1254 value	3.35	X	X

TABLE F-19
Ingestion-Based Toxicity Reference Values (TRVs) for Birds
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Chemical Form	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	Reference	NOAEL (mg/kg/d)	Reference	MATC (mg/kg/d)	Green Heron	Spotted Sandpiper
Volatile and Semivolatile Organic Compounds													
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	NA	--	NA	--	NA	--	--
1,2,4-Trichlorobenzene	--	northern bobwhite	0.19	14 days	oral	survival	161 b	1,4-Dichlorobenzene value	32.2 d	1,4-Dichlorobenzene value	71.9	X	X
1,2-Dichlorobenzene	--	northern bobwhite	0.19	14 days	oral	survival	161 b	1,4-Dichlorobenzene value	32.2 d	1,4-Dichlorobenzene value	71.9	X	X
1,3-Dichlorobenzene	--	northern bobwhite	0.19	14 days	oral	survival	161 b	1,4-Dichlorobenzene value	32.2 d	1,4-Dichlorobenzene value	71.9	X	X
1,4-Dichlorobenzene	--	northern bobwhite	0.19	14 days	oral	survival	161 b	--	32.2 d	TERRETOX 2002	71.9	X	X
Acenaphthene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Acenaphthylene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Anthracene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Benzo(a)anthracene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Benzo(a)pyrene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Rigdon and Neal 1963	15.9	X	X
Benzo(b)fluoranthene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Benzo(g,h,i)perylene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Benzo(k)fluoranthene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Chrysene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Dibenz(a,h)anthracene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Fluoranthene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Fluorene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Indeno(1,2,3-cd)pyrene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Phenanthrene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X
Pyrene	--	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	--	7.10 c	Benzo(a)pyrene value	15.9	X	X

NA - Not Available

[a] Uncertainty factor of 5 applied to LOAEL

[b] Uncertainty factor of 5 applied to NOAEL

[c] Subchronic to chronic uncertainty factor of 10 applied

[d] Acute to chronic uncertainty factor of 50 applied

[e] Uncertainty factor of 100 applied to LD50

TABLE F-20
Background Data and Upper Tolerance Limits (UTLs) - West Vieques Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	KTd			Qa			Qs			Combined Set		
	Maximum	Mean	UTL	Maximum	Mean	UTL	Maximum	Mean	UTL	Maximum	Mean	UTL
Inorganics (mg/kg)												
Aluminum	18,000	11,346	18,000	29,000	13,350	29,000	11,000	3,875	11,000	29,000	9,573	29,000
Antimony	1.40	0.68	1.40	2.30	0.81	2.30	1.00	0.53	1.00	2.30	0.67	2.30
Arsenic	1.20	0.65	1.20	2.20	0.95	2.20	2.10	1.13	2.10	2.20	0.89	2.20
Barium	190	84.0	190	320	94.3	320	24.0	14.6	24.0	320	64.8	320
Beryllium	0.27	0.17	0.27	0.46	0.24	0.46	0.41	0.23	0.41	0.46	0.21	0.45
Cadmium	--	0.031	0.036	--	0.033	0.036	--	0.036	0.040	--	0.033	0.040
Calcium	9,100	4,838	9,100	45,000	11,817	45,000	210,000	84,000	210,000	210,000	29,849	210,000
Chromium	52.0	12.7	52.0	74.0	26.0	74.0	48.0	9.38	48.0	74.0	15.9	74.0
Cobalt	13.0	9.06	13.0	25.0	12.5	33.3	13.0	2.90	13.0	25.0	8.18	25.0
Copper	47.0	28.4	47.0	68.0	31.2	68.0	35.0	9.83	35.0	68.0	23.3	68.0
Iron	28,000	20,692	28,000	39,000	23,167	39,000	18,000	6,475	18,000	39,000	16,884	37,531
Lead	5.70	3.17	5.70	6.00	3.96	6.00	6.90	2.75	6.90	6.90	3.30	6.90
Magnesium	7,200	3,985	7,200	16,000	4,625	16,000	11,000	3,842	11,000	16,000	4,146	12,834
Manganese	1,200	626	1,200	1,200	663	1,200	360	132	360	1,200	478	1,167
Mercury	0.024	0.011	0.024	0.031	0.018	0.031	0.016	0.009	0.016	0.031	0.013	0.031
Nickel	18.0	5.09	18.0	40.0	12.8	40.0	26.0	3.86	26.0	40.0	7.18	40.0
Potassium	1,400	875	1,400	1,400	1,023	1,400	1,700	859	1,700	1,700	918	1,700
Selenium	0.73	0.54	0.73	2.00	0.85	2.00	--	0.61	0.68	2.00	0.66	2.00
Silver	--	0.065	0.076	--	0.069	0.077	--	0.075	0.084	--	0.069	0.084
Sodium	310	116	310	1,200	367	1,200	6,300	2,803	6,300	6,300	1,069	6,300
Thallium	0.46	0.39	0.46	0.67	0.43	0.67	--	0.45	0.50	0.67	0.42	0.67
Vanadium	80.0	53.2	80.0	130	73.1	130	63.0	22.2	63.0	130	49.6	130
Zinc	53.0	35.5	53.0	71.0	37.8	71.0	31.0	11.8	31.0	71.0	28.5	65.1
Pesticides (ug/kg)[1]												
4,4'-DDD	--	--	--	--	--	--	--	--	--	40.0	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--	3,990	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--	2,190	--	--
Aldrin	--	--	--	--	--	--	--	--	--	0.87	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--	4.60	--	--
beta-BHC	--	--	--	--	--	--	--	--	--	1.40	--	--
delta-BHC	--	--	--	--	--	--	--	--	--	0.59	--	--

TABLE F-20
Background Data and Upper Tolerance Limits (UTLs) - West Vieques Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	KTd			Qa			Qs			Combined Set		
	Maximum	Mean	UTL	Maximum	Mean	UTL	Maximum	Mean	UTL	Maximum	Mean	UTL
Dieldrin	--	--	--	--	--	--	--	--	--	3.90	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--	3.50	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--	0.65	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--	90.0	--	--
Endrin	--	--	--	--	--	--	--	--	--	16.0	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--	11.0	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--	--	--	--
gamma-BHC (Lindane)	--	--	--	--	--	--	--	--	--	0.66	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--	270	--	--
Heptachlor	--	--	--	--	--	--	--	--	--	1.50	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--	1.70	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--	240	--	--
Toxaphene	--	--	--	--	--	--	--	--	--	--	--	--

1 - Maximum detected concentrations at West Vieques sites considered representative of normal pesticide application and not CERCLA releases (CH2M HILL, 2009b)

TABLE F-21
Background Data and 95% UTL Values - Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Background 95% UTL	
Pesticide/Polychlorinated Biphenyls (UG/L)											
4,4'-DDD	0.0054 - 0.0055	1 / 10	0.048	0.048	VWW06-SW018-0211	0.0072	0.014	0.016	0.0036	0.048	1
4,4'-DDE	0.0078 - 0.0081	1 / 10	0.067	0.067	VWW06-SW018-0211	0.010	0.020	0.022	0.0052	0.067	1
4,4'-DDT	0.0023 - 0.0023	1 / 10	0.083	0.083	VWW06-SW018-0211	0.0093	0.026	0.024	0.0018	0.083	1
Aldrin	0.0033 - 0.0034	1 / 10	0.0046	0.0046	VWW06-SW018-0211	0.0020	0.001	0.0025	0.0018	0.0046	1
alpha-BHC	0.0062 - 0.0064	0 / 10	--	--	--	0.0031	0.00003	0.0031	0.0031	NA	
alpha-Chlordane	0.0062 - 0.0064	1 / 10	0.045	0.045	VWW06-SW018-0211	0.0073	0.013	0.015	0.0041	0.045	1
Aroclor-1016	0.020 - 0.021	0 / 6	--	--	--	0.010	0.0003	0.011	0.010	NA	
Aroclor-1221	0.020 - 0.021	0 / 6	--	--	--	0.010	0.0003	0.011	0.010	NA	
Aroclor-1232	0.016 - 0.017	0 / 6	--	--	--	0.0081	0.0002	0.0083	0.0081	NA	
Aroclor-1242	0.020 - 0.021	0 / 6	--	--	--	0.010	0.0003	0.011	0.010	NA	
Aroclor-1248	0.011 - 0.011	0 / 6	--	--	--	0.0055	0.0	0.0055	0.0055	NA	
Aroclor-1254	0.0098 - 0.010	0 / 6	--	--	--	0.0049	0.00004	0.0050	0.0049	NA	
Aroclor-1260	0.020 - 0.021	0 / 6	--	--	--	0.010	0.0003	0.011	0.010	NA	
beta-BHC	0.0025 - 0.0026	1 / 10	0.025	0.025	VWW06-SW018-0211	0.0036	0.0075	0.0080	0.0017	0.025	1
delta-BHC	0.0062 - 0.0064	1 / 10	0.012	0.012	VWW06-SW018-0211	0.0040	0.0028	0.0056	0.0036	0.012	1
Dieldrin	0.0056 - 0.0057	1 / 10	0.047	0.047	VWW06-SW018-0211	0.0072	0.014	0.015	0.0037	0.047	1
Endosulfan I	0.0089 - 0.0091	1 / 10	0.049	0.049	VWW06-SW018-0211	0.0089	0.014	0.017	0.0057	0.049	1
Endosulfan II	0.0033 - 0.0034	1 / 10	0.040	0.040	VWW06-SW018-0211	0.0055	0.012	0.013	0.0023	0.040	1
Endosulfan sulfate	0.0021 - 0.0021	1 / 10	0.026	0.026	VWW06-SW018-0211	0.0035	0.0079	0.0081	0.0014	0.026	1
Endrin	0.0037 - 0.0038	1 / 10	0.053	0.053	VWW06-SW018-0211	0.0070	0.016	0.016	0.0026	0.053	1
Endrin aldehyde	0.0031 - 0.0032	1 / 10	0.0053	0.0053	VWW06-SW018-0211	0.0019	0.0012	0.0026	0.0018	0.0053	1
Endrin ketone	0.012 - 0.013	1 / 10	0.029	0.029	VWW06-SW018-0211	0.0084	0.0072	0.013	0.0071	0.029	1
gamma-BHC (Lindane)	0.0049 - 0.0051	0 / 10	--	--	--	0.0025	0.00003	0.0025	0.0025	NA	
gamma-Chlordane	0.0049 - 0.0051	1 / 10	0.026	0.026	VWW06-SW018-0211	0.0048	0.0074	0.0092	0.0032	0.026	1
Heptachlor	0.0082 - 0.0084	1 / 10	0.0074	0.0074	VWW06-SW018-0211	0.0044	0.0010	0.0050	0.0044	0.0074	1
Heptachlor epoxide	0.0029 - 0.0030	1 / 10	0.038	0.038	VWW06-SW018-0211	0.0051	0.012	0.012	0.0020	0.038	1
Methoxychlor	0.0037 - 0.0038	1 / 10	0.061	0.061	VWW06-SW018-0211	0.0078	0.019	0.019	0.0027	0.061	1
Toxaphene	0.37 - 0.38	0 / 10	--	--	--	0.19	0.0026	0.19	0.19	NA	

TABLE F-21
Background Data and 95% UTL Values - Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Background 95% UTL
Inorganics (UG/L)										
Aluminum	186 - 186	2 / 4	282	428	VWW06-SW016-0211	224	163	415	180	428 1
Antimony	20.0 - 66.0	2 / 10	36.8	72.7	VWW06-SW023-0211	21.3	20.9	33.3	15.7	36.8
Arsenic	50.0 - 66.2	0 / 10	--	--	--	29.1	4.27	31.5	28.8	NA
Barium	-- - --	10 / 10	8.47	33.9	VWW06-SW016-0211	19.1	11.3	25.7	16.3	33.9
Beryllium	2.40 - 2.40	0 / 10	--	--	--	1.20	0.0	1.20	1.20	NA
Cadmium	14.4 - 20.0	7 / 10	8.76	11.4	VWW06-SW017-0211	9.30	1.37	10.1	9.20	12.5
Calcium	-- - --	10 / 10	410,000	539,000	VWW06-SW016-0211	460,700	50,542	489,998	458,276	539,000
Chromium	8.60 - 8.60	0 / 10	--	--	--	4.30	0.0	4.30	4.30	NA
Cobalt	7.40 - 7.40	0 / 10	--	--	--	3.70	0.0	3.70	3.70	NA
Copper	50.0 - 50.0	9 / 10	40.7	149	VWW06-SW016-0211	63.9	40.2	87.2	55.0	152
Iron	110 - 110	6 / 10	176	1,660	VWW06-SW019-0211	354	494	640	180	5,270
Lead	20.0 - 20.0	0 / 10	--	--	--	10.0	0.0	10.0	10.0	NA
Magnesium	-- - --	10 / 10	1,290,000	1,620,000	VWW06-SW016-0211	1,411,000	135,027	1,489,272	1,405,340	1,620,000
Manganese	7.00 - 7.00	0 / 10	--	--	--	3.50	0.0	3.50	3.50	NA
Mercury	0.074 - 0.074	4 / 10	0.041	0.052	VWW06-SW015-0211	0.041	0.0060	0.044	0.040	0.055
Nickel	18.6 - 18.6	0 / 10	--	--	--	9.30	0.0	9.30	9.30	NA
Potassium	-- - --	10 / 10	421,000	533,000	VWW06-SW014-0211	469,300	48,660	497,507	467,084	533,000
Selenium	82.0 - 82.0	9 / 10	49.3	113	VWW06-SW014-0211	78.7	26.9	94.3	74.1	126
Silver	5.00 - 10.4	0 / 10	--	--	--	2.77	0.85	3.26	2.69	NA
Sodium	-- - --	10 / 10	10,800,000	13,800,000	VWW06-SW016-0211	12,030,000	1,319,975	12,795,165	11,966,506	13,800,000
Thallium	88.0 - 88.0	0 / 10	--	--	--	44.0	0.0	44.0	44.0	NA
Vanadium	8.80 - 8.80	4 / 10	4.98	7.77	VWW06-SW019-0211	5.05	1.10	5.69	4.96	6.48
Zinc	80.0 - 80.0	0 / 10	--	--	--	40.0	0.0	40.0	40.0	NA
Dissolved Metals (UG/L)										
Aluminum	186 - 186	2 / 10	200	252	VWW06-SW016-0211	120	57.4	153	111	242
Antimony	20.0 - 20.0	0 / 10	--	--	--	10.0	0.0	10.0	10.0	NA
Arsenic	50.0 - 66.2	0 / 10	--	--	--	29.9	4.18	32.3	29.6	NA
Barium	-- - --	10 / 10	7.76	28.4	VWW06-SW017-0211	16.6	9.29	22.0	14.4	28.4
Beryllium	2.40 - 2.40	0 / 10	--	--	--	1.20	0.0	1.20	1.20	NA
Cadmium	14.4 - 14.4	0 / 10	--	--	--	7.20	0.0	7.20	7.20	NA
Calcium	-- - --	4 / 4	535,000	556,000	VWW06-SW015-0211	548,000	9,274	558,912	547,941	556,000 1

TABLE F-21
Background Data and 95% UTL Values - Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Background 95% UTL	
Chromium	8.60 - 8.60	0 / 10	--	--	--	4.30	0.0	4.30	4.30	NA	
Cobalt	7.40 - 7.40	0 / 10	--	--	--	3.70	0.0	3.70	3.70	NA	
Copper	50.0 - 54.0	1 / 10	26.0	26.0	VWW06-SW023-0211	26.1	0.99	26.7	26.1	26.0	1
Iron	110 - 110	0 / 10	--	--	--	55.0	0.0	55.0	55.0	NA	
Lead	20.0 - 20.0	1 / 10	11.9	11.9	VWW06-SW023-0211	10.2	0.60	10.5	10.2	11.9	1
Magnesium	-- - --	4 / 4	1,640,000	1,690,000	VWW06-SW016-0211	1,675,000	23,805	1,703,011	1,674,872	1,690,000	1
Manganese	7.00 - 7.00	0 / 10	--	--	--	3.50	0.0	3.50	3.50	NA	
Mercury	0.074 - 0.074	5 / 10	0.045	0.062	VWW06-SW014-0211	0.045	0.0093	0.050	0.044	0.067	
Nickel	18.6 - 18.6	0 / 10	--	--	--	9.30	0.0	9.30	9.30	NA	
Potassium	-- - --	4 / 4	533,000	552,000	VWW06-SW016-0211	543,500	9,037	554,134	543,444	552,000	1
Selenium	82.0 - 82.0	8 / 10	68.8	121	VWW06-SW023-0211	86.4	28.9	103	81.1	126	
Silver	5.00 - 10.4	0 / 10	--	--	--	2.77	0.85	3.26	2.69	NA	
Sodium	-- - --	10 / 10	10,900,000	15,600,000	VWW06-SW016-0211	12,420,000	1,802,344	13,464,785	12,307,827	15,600,000	
Thallium	88.0 - 88.0	0 / 10	--	--	--	44.0	0.0	44.0	44.0	NA	
Vanadium	8.80 - 8.80	5 / 10	4.50	5.82	VWW06-SW022-0211	4.84	0.60	5.19	4.81	6.25	
Zinc	80.0 - 80.0	0 / 10	--	--	--	40.0	0.0	40.0	40.0	NA	
Other Parameters (MG/L)											
Chromium (hexavalent)	-- - --	10 / 10	0.0080	0.097	VWW06-SW017-0211	0.037	0.026	0.052	0.029	0.099	
Dissolved Other Parameters (MG/L)											
Chromium (hexavalent)	0.0070 - 0.0070	9 / 10	0.0040	0.038	VWW06-SW016-0211	0.015	0.0099	0.021	0.012	0.032	

NA - Not Applicable (insufficient data)
1 - Maximum detected value

TABLE F-22
Background Data and 95% UTL Values - Surface Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Background 95% UTL
Pesticide/Polychlorinated Biphenyls (UG/KG)										
4,4'-DDD	2.20 - 4.50	0 / 10	--	--	--	1.84	0.33	2.02	1.80	NA
4,4'-DDE	1.10 - 2.40	1 / 10	1.30	1.30	VWW06-SD014-0211	1.01	0.21	1.13	0.99	1.30 1
4,4'-DDT	1.60 - 3.40	0 / 10	--	--	--	1.36	0.25	1.50	1.34	NA
Aldrin	0.64 - 1.30	0 / 10	--	--	--	0.54	0.097	0.59	0.53	NA
alpha-BHC	3.20 - 6.60	0 / 10	--	--	--	2.70	0.48	2.98	2.65	NA
alpha-Chlordane	0.68 - 1.40	0 / 10	--	--	--	0.57	0.10	0.63	0.56	NA
Aroclor-1016	55.0 - 96.0	0 / 10	--	--	--	34.7	6.96	38.7	34.1	NA
Aroclor-1221	51.0 - 89.0	0 / 10	--	--	--	31.9	6.41	35.6	31.4	NA
Aroclor-1232	64.0 - 110	0 / 10	--	--	--	39.9	7.90	44.5	39.2	NA
Aroclor-1242	46.0 - 81.0	0 / 10	--	--	--	29.2	5.92	32.6	28.7	NA
Aroclor-1248	46.0 - 81.0	0 / 10	--	--	--	29.2	5.92	32.6	28.7	NA
Aroclor-1254	40.0 - 70.0	0 / 10	--	--	--	25.2	5.15	28.2	24.8	NA
Aroclor-1260	26.0 - 45.0	0 / 10	--	--	--	16.2	3.30	18.1	15.9	NA
beta-BHC	0.64 - 1.30	0 / 10	--	--	--	0.54	0.097	0.59	0.53	NA
delta-BHC	1.20 - 2.50	0 / 10	--	--	--	1.02	0.18	1.12	1.00	NA
Dieldrin	0.68 - 1.40	0 / 10	--	--	--	0.57	0.10	0.63	0.56	NA
Endosulfan I	0.93 - 2.00	0 / 10	--	--	--	0.79	0.15	0.88	0.78	NA
Endosulfan II	1.20 - 2.60	0 / 10	--	--	--	1.04	0.19	1.15	1.02	NA
Endosulfan sulfate	0.85 - 1.80	0 / 10	--	--	--	0.71	0.13	0.79	0.70	NA
Endrin	1.10 - 2.30	0 / 10	--	--	--	0.93	0.17	1.03	0.91	NA
Endrin aldehyde	1.50 - 3.20	0 / 10	--	--	--	1.30	0.24	1.44	1.28	NA
Endrin ketone	0.89 - 1.90	0 / 10	--	--	--	0.76	0.14	0.84	0.75	NA
gamma-BHC (Lindane)	0.85 - 1.80	0 / 10	--	--	--	0.71	0.13	0.79	0.70	NA
gamma-Chlordane	0.72 - 1.50	0 / 10	--	--	--	0.61	0.11	0.67	0.59	NA
Heptachlor	0.85 - 1.80	0 / 10	--	--	--	0.71	0.13	0.79	0.70	NA
Heptachlor epoxide	0.64 - 1.30	0 / 10	--	--	--	0.54	0.097	0.59	0.53	NA
Methoxychlor	1.10 - 2.40	0 / 10	--	--	--	0.97	0.19	1.08	0.95	NA
Toxaphene	110 - 220	0 / 10	--	--	--	89.0	15.4	97.9	87.6	NA

TABLE F-22
Background Data and 95% UTL Values - Surface Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Background 95% UTL
Inorganics (MG/KG)										
Aluminum	-- - --	10 / 10	7,980	29,200	VWW06-SD020-0211	16,474	7,871	21,037	14,859	35,000
Antimony	0.89 - 1.51	0 / 10	--	--	--	0.57	0.099	0.63	0.56	NA
Arsenic	1.40 - 2.50	8 / 10	2.00	6.20	VWW06-SD022-0211	3.54	2.14	4.78	2.85	28.8
Barium	-- - --	10 / 10	7.11	19.8	VWW06-SD020-0211	11.8	3.70	13.9	11.3	20.5
Beryllium	0.59 - 1.00	5 / 10	0.38	0.65	VWW06-SD018-0211	0.45	0.11	0.52	0.44	0.72
Cadmium	0.19 - 0.31	1 / 10	0.175	0.175	VWW06-SD014-0211	0.12	0.027	0.14	0.12	0.175 1
Calcium	-- - --	10 / 10	4,750	53,000	VWW06-SD021-0211	18,602	14,607	27,069	14,531	66,700
Chromium	-- - --	10 / 10	6.70	20.0	VWW06-SD015-0211	13.6	3.56	15.6	13.1	15.1
Cobalt	-- - --	10 / 10	3.30	8.48	VWW06-SD018-0211	5.37	1.70	6.36	5.14	9.37
Copper	-- - --	10 / 10	23.4	47.6	VWW06-SD020-0211	35.8	7.78	40.3	35.0	54.1
Iron	-- - --	10 / 10	8,870	35,300	VWW06-SD018-0211	20,477	9,947	26,243	18,213	43,900
Lead	-- - --	10 / 10	3.94	12.6	VWW06-SD018-0211	7.73	3.13	9.55	7.20	15.1
Magnesium	-- - --	10 / 10	8,880	15,800	VWW06-SD017-0211	10,692	2,140	11,933	10,528	17,500
Manganese	-- - --	10 / 10	63.0	359	VWW06-SD018-0211	218	100	276	194	455
Mercury	-- - --	10 / 10	0.043	0.131	VWW06-SD016-0211	0.081	0.024	0.095	0.078	0.138
Nickel	-- - --	10 / 10	5.16	8.60	VWW06-SD020-0211	7.17	1.07	7.78	7.09	9.68
Potassium	-- - --	10 / 10	2,750	5,360	VWW06-SD018-0211	4,095	848	4,587	4,015	6,090
Selenium	1.10 - 2.50	5 / 10	1.40	4.40	VWW06-SD021-0211	1.63	1.15	2.29	1.35	4.34
Silver	0.59 - 1.00	0 / 10	--	--	--	0.38	0.066	0.42	0.37	NA
Sodium	-- - --	10 / 10	30,800	74,700	VWW06-SD017-0211	44,740	14,593	53,199	42,896	96,400
Thallium	1.26 - 2.14	2 / 10	1.24	1.70	VWW06-SD019-0211	0.95	0.33	1.14	0.91	1.69
Vanadium	-- - --	10 / 10	20.7	58.6	VWW06-SD017-0211	43.2	12.1	50.2	41.4	71.7
Zinc	-- - --	10 / 10	31.9	76.0	VWW06-SD018-0211	50.2	15.7	59.3	48.1	87.3
Other Parameters										
Chromium (hexavalent) (UG/KG)	-- - --	10 / 10	9,340	150,000	VWW06-SD015-0211	47,544	43,365	72,682	35,745	219,000
pH	-- - --	10 / 10	7.05	7.52	VWW06-SD021-0211	7.24	0.13	7.31	7.24	--

NA - Not Applicable (insufficient data)
1 - Maximum detected value

TABLE F-23
Screening Statistics - Surface Water - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Volatile Organic Compounds (UG/L)																			
1,1,1-Trichloroethane	0.28 - 0.28	0 / 5	--	--	--	0.14	0.0	0.14	0.14	312	-- / --	0.001	NO	--	-- / --	--	--	--	NO
1,1,2,2-Tetrachloroethane	0.26 - 0.26	0 / 5	--	--	--	0.13	0.0	0.13	0.13	90.2	-- / --	0.003	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.46 - 0.46	0 / 5	--	--	--	0.23	0.0	0.23	0.23	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloroethane	0.40 - 0.40	0 / 5	--	--	--	0.20	0.0	0.20	0.20	550	-- / --	0.001	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethane	0.30 - 0.30	0 / 5	--	--	--	0.15	0.0	0.15	0.15	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethene	0.38 - 0.38	0 / 5	--	--	--	0.19	0.0	0.19	0.19	2,240	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
1,2,3-Trichlorobenzene	0.32 - 0.32	0 / 5	--	--	--	0.16	0.0	0.16	0.16	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2,4-Trichlorobenzene	0.22 - 0.22	0 / 5	--	--	--	0.11	0.0	0.11	0.11	5.40	-- / --	0.04	NO	--	-- / --	--	--	--	NO
1,2-Dibromo-3-chloropropane	2.00 - 2.00	0 / 5	--	--	--	1.00	0.0	1.00	1.00	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dibromoethane	0.22 - 0.22	0 / 5	--	--	--	0.11	0.0	0.11	0.11	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dichlorobenzene	0.50 - 0.50	0 / 5	--	--	--	0.25	0.0	0.25	0.25	42.0	-- / --	0.01	NO	--	-- / --	--	--	--	NO
1,2-Dichloroethane	0.30 - 0.30	0 / 5	--	--	--	0.15	0.0	0.15	0.15	1,130	-- / --	0.0003	NO	--	-- / --	--	--	--	NO
1,2-Dichloropropane	0.30 - 0.30	0 / 5	--	--	--	0.15	0.0	0.15	0.15	2,400	-- / --	0.0001	NO	--	-- / --	--	--	--	NO
1,3-Dichlorobenzene	0.30 - 0.30	0 / 5	--	--	--	0.15	0.0	0.15	0.15	28.5	-- / --	0.01	NO	--	-- / --	--	--	--	NO
1,4-Dichlorobenzene	0.30 - 0.30	0 / 5	--	--	--	0.15	0.0	0.15	0.15	19.9	-- / --	0.02	NO	--	-- / --	--	--	--	NO
2-Butanone	4.00 - 4.00	0 / 5	--	--	--	2.00	0.0	2.00	2.00	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2-Hexanone	0.96 - 0.96	0 / 5	--	--	--	0.48	0.0	0.48	0.48	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Methyl-2-pentanone	2.00 - 2.00	0 / 5	--	--	--	1.00	0.0	1.00	1.00	123,000	-- / --	0.00002	NO	--	-- / --	--	--	--	NO
Acetone	2.60 - 3.60	0 / 5	--	--	--	1.42	0.22	1.63	1.41	564,000	-- / --	0.00001	NO	--	-- / --	--	--	--	NO
Benzene	0.34 - 0.34	0 / 5	--	--	--	0.17	0.0	0.17	0.17	110	-- / --	0.003	NO	--	-- / --	--	--	--	NO
Bromochloromethane	0.34 - 0.34	0 / 5	--	--	--	0.17	0.0	0.17	0.17	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromodichloromethane	0.30 - 0.30	0 / 5	--	--	--	0.15	0.0	0.15	0.15	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromoform	0.38 - 0.38	0 / 5	--	--	--	0.19	0.0	0.19	0.19	640	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Bromomethane	0.86 - 0.86	0 / 5	--	--	--	0.43	0.0	0.43	0.43	120	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Carbon disulfide	0.38 - 0.38	0 / 5	--	--	--	0.19	0.0	0.19	0.19	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Carbon tetrachloride	0.28 - 0.28	0 / 5	--	--	--	0.14	0.0	0.14	0.14	1,500	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
Chlorobenzene	0.32 - 0.32	0 / 5	--	--	--	0.16	0.0	0.16	0.16	25.0	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Chloroethane	1.00 - 1.00	0 / 5	--	--	--	0.50	0.0	0.50	0.50	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chloroform	0.32 - 0.32	0 / 5	--	--	--	0.16	0.0	0.16	0.16	815	-- / --	0.0004	NO	--	-- / --	--	--	--	NO
Chloromethane	0.64 - 0.64	0 / 5	--	--	--	0.32	0.0	0.32	0.32	2,700	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
cis-1,2-Dichloroethene	0.38 - 0.38	0 / 5	--	--	--	0.19	0.0	0.19	0.19	680	-- / --	0.001	NO	--	-- / --	--	--	--	NO
cis-1,3-Dichloropropene	0.24 - 0.24	0 / 5	--	--	--	0.12	0.0	0.12	0.12	7.90	-- / --	0.03	NO	--	-- / --	--	--	--	NO
Cyclohexane	0.40 - 0.40	0 / 5	--	--	--	0.20	0.0	0.20	0.20	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dibromochloromethane	0.26 - 0.26	0 / 5	--	--	--	0.13	0.0	0.13	0.13	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dichlorodifluoromethane (Freon-12)	0.34 - 0.34	0 / 5	--	--	--	0.17	0.0	0.17	0.17	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Ethylbenzene	0.44 - 0.44	0 / 5	--	--	--	0.22	0.0	0.22	0.22	25.0	-- / --	0.02	NO	--	-- / --	--	--	--	NO
Isopropylbenzene	0.28 - 0.28	0 / 5	--	--	--	0.14	0.0	0.14	0.14	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methyl acetate	0.76 - 0.76	0 / 5	--	--	--	0.38	0.0	0.38	0.38	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylcyclohexane	0.54 - 0.54	0 / 5	--	--	--	0.27	0.0	0.27	0.27	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylene chloride	1.30 - 1.30	0 / 5	--	--	--	0.65	0.0	0.65	0.65	2,560	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Methyl-tert-butyl ether (MTBE)	1.00 - 1.00	0 / 5	--	--	--	0.50	0.0	0.50	0.50	5,000	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
Styrene	0.24 - 0.24	0 / 5	--	--	--	0.12	0.0	0.12	0.12	910	-- / --	0.0003	NO	--	-- / --	--	--	--	NO
Tetrachloroethene	0.42 - 0.42	0 / 5	--	--	--	0.21	0.0	0.21	0.21	45.0	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Toluene	0.28 - 0.28	0 / 5	--	--	--	0.14	0.0	0.14	0.14	215	-- / --	0.001	NO	--	-- / --	--	--	--	NO
trans-1,2-Dichloroethene	0.50 - 0.50	0 / 5	--	--	--	0.25	0.0	0.25	0.25	680	-- / --	0.001	NO	--	-- / --	--	--	--	NO
trans-1,3-Dichloropropene	0.60 - 0.60	0 / 5	--	--	--	0.30	0.0	0.30	0.30	7.90	-- / --	0.08	NO	--	-- / --	--	--	--	NO
Trichloroethene	0.38 - 0.38	0 / 5	--	--	--	0.19	0.0	0.19	0.19	1,940	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
Trichlorofluoromethane (Freon-11)	0.24 - 0.24	0 / 5	--	--	--	0.12	0.0	0.12	0.12	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Vinyl chloride	0.36 - 0.36	0 / 5	--	--	--	0.18	0.0	0.18	0.18	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Xylene, total	1.00 - 1.00	0 / 5	--	--	--	0.50	0.0	0.50	0.50	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Semivolatile Organic Compounds (UG/L)																			
1-Methylnaphthalene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2-Methylnaphthalene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Acenaphthene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	40.0	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Acenaphthylene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Anthracene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	0.18	-- / --	0.23	NO	--	-- / --	--	--	--	NO
Benzo(a)anthracene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO

TABLE F-23
Screening Statistics - Surface Water - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Benzo(a)pyrene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Benzo(b)fluoranthene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Benzo(g,h,i)perylene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Benzo(k)fluoranthene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chrysene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dibenz(a,h)anthracene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Fluoranthene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	11.0	-- / --	0.004	NO	--	-- / --	--	--	--	NO
Fluorene	0.041 - 0.041	3 / 5	0.043	0.055	VWW06-SW007-0211	0.037	0.016	0.052	0.034	3.90	0 / 5	0.01	NO	--	-- / --	--	--	--	NO
Indeno(1,2,3-cd)pyrene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Naphthalene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	1.40	-- / --	0.03	NO	--	-- / --	--	--	--	NO
Phenanthrene	0.051 - 0.059	3 / 5	0.064	0.079	VWW06-SW007-0211	0.053	0.024	0.077	0.048	8.30	0 / 5	0.01	NO	--	-- / --	--	--	--	NO
Pyrene	0.041 - 0.042	0 / 5	--	--	--	0.021	0.0002	0.021	0.021	0.24	-- / --	0.18	NO	--	-- / --	--	--	--	NO
Pesticide/Polychlorinated Biphenyls (UG/L)																			
4,4'-DDD	0.0053 - 0.0054	0 / 5	--	--	--	0.0027	0.00002	0.0027	0.0027	0.0010	-- / --	5.40	YES	0.048	-- / --	0.11	--	--	NO
4,4'-DDE	0.0078 - 0.0079	0 / 5	--	--	--	0.0039	0.00003	0.0040	0.0039	0.0010	-- / --	7.90	YES	0.067	-- / --	0.12	--	--	NO
4,4'-DDT	0.0022 - 0.0023	0 / 5	--	--	--	0.0011	0.00002	0.0012	0.0011	0.0010	-- / --	2.30	YES	0.083	-- / --	0.03	--	--	NO
Aldrin	0.0033 - 0.0033	0 / 5	--	--	--	0.0017	0.0	0.0017	0.0017	0.13	-- / --	0.03	NO	--	-- / --	--	--	--	NO
alpha-BHC	0.0062 - 0.0062	0 / 5	--	--	--	0.0031	0.0	0.0031	0.0031	25.0	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
alpha-Chlordane	0.0062 - 0.0062	0 / 5	--	--	--	0.0031	0.0	0.0031	0.0031	0.0040	-- / --	1.55	YES	0.045	-- / --	0.14	--	--	NO
Aroclor-1016	0.020 - 0.021	0 / 5	--	--	--	0.010	0.0003	0.010	0.010	0.030	-- / --	0.70	NO	--	-- / --	--	--	--	NO
Aroclor-1221	0.020 - 0.021	0 / 5	--	--	--	0.010	0.0003	0.010	0.010	0.030	-- / --	0.70	NO	--	-- / --	--	--	--	NO
Aroclor-1232	0.016 - 0.016	0 / 5	--	--	--	0.0080	0.0	0.0080	0.0080	0.030	-- / --	0.53	NO	--	-- / --	--	--	--	NO
Aroclor-1242	0.020 - 0.021	0 / 5	--	--	--	0.010	0.0003	0.010	0.010	0.030	-- / --	0.70	NO	--	-- / --	--	--	--	NO
Aroclor-1248	0.011 - 0.011	0 / 5	--	--	--	0.0055	0.0	0.0055	0.0055	0.030	-- / --	0.37	NO	--	-- / --	--	--	--	NO
Aroclor-1254	0.0098 - 0.010	0 / 5	--	--	--	0.0049	0.00004	0.0050	0.0049	0.030	-- / --	0.33	NO	--	-- / --	--	--	--	NO
Aroclor-1260	0.020 - 0.021	0 / 5	--	--	--	0.010	0.0003	0.010	0.010	0.030	-- / --	0.70	NO	--	-- / --	--	--	--	NO
beta-BHC	0.0025 - 0.0025	0 / 5	--	--	--	0.0013	0.0	0.0013	0.0013	25.0	-- / --	0.0001	NO	--	-- / --	--	--	--	NO
delta-BHC	0.0062 - 0.0062	0 / 5	--	--	--	0.0031	0.0	0.0031	0.0031	25.0	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
Dieldrin	0.0055 - 0.0056	0 / 5	--	--	--	0.0028	0.00002	0.0028	0.0028	0.11	-- / --	0.05	NO	--	-- / --	--	--	--	NO
Endosulfan I	0.0088 - 0.0090	0 / 5	--	--	--	0.0045	0.00004	0.0045	0.0044	0.0087	-- / --	1.03	YES	0.049	-- / --	0.18	--	--	NO
Endosulfan II	0.0033 - 0.0033	0 / 5	--	--	--	0.0017	0.0	0.0017	0.0017	0.0087	-- / --	0.38	NO	--	-- / --	--	--	--	NO
Endosulfan sulfate	0.0020 - 0.0021	0 / 5	--	--	--	0.0010	0.00002	0.0011	0.0010	0.0087	-- / --	0.24	NO	--	-- / --	--	--	--	NO
Endrin	0.0037 - 0.0038	0 / 5	--	--	--	0.0019	0.00002	0.0019	0.0019	0.010	-- / --	0.38	NO	--	-- / --	--	--	--	NO
Endrin aldehyde	0.0031 - 0.0031	0 / 5	--	--	--	0.0016	0.0	0.0016	0.0016	0.010	-- / --	0.31	NO	--	-- / --	--	--	--	NO
Endrin ketone	0.012 - 0.012	0 / 5	--	--	--	0.0060	0.0	0.0060	0.0060	0.010	-- / --	1.20	YES	0.029	-- / --	0.41	--	--	NO
gamma-BHC (Lindane)	0.0049 - 0.0050	0 / 5	--	--	--	0.0025	0.00003	0.0025	0.0025	0.16	-- / --	0.03	NO	--	-- / --	--	--	--	NO
gamma-Chlordane	0.0049 - 0.0050	0 / 5	--	--	--	0.0025	0.00003	0.0025	0.0025	0.0040	-- / --	1.25	YES	0.026	-- / --	0.19	--	--	NO
Heptachlor	0.0081 - 0.0082	0 / 5	--	--	--	0.0041	0.00002	0.0041	0.0041	0.0036	-- / --	2.28	YES	0.0074	-- / --	1.11	1.14	1.14	NO[4]
Heptachlor epoxide	0.0029 - 0.0029	0 / 5	--	--	--	0.0015	0.0	0.0015	0.0015	0.0036	-- / --	0.81	NO	--	-- / --	--	--	--	NO
Methoxychlor	0.0037 - 0.0038	0 / 5	--	--	--	0.0019	0.00002	0.0019	0.0019	0.030	-- / --	0.13	NO	--	-- / --	--	--	--	NO
Toxaphene	0.37 - 0.38	0 / 5	--	--	--	0.19	0.0022	0.19	0.19	0.21	-- / --	1.81	YES	--	-- / --	--	0.90	0.89	NO
Inorganics (UG/L)																			
Aluminum	-- - --	0 / 0	--	--	--	--	--	--	--	87.0	-- / --	--	NO	--	-- / --	--	--	--	NO
Antimony	20.0 - 100	1 / 5	10.3	10.3	VWW06-SW003-0211	34.1	21.8	54.9	26.4	500	0 / 5	0.02	NO	--	-- / --	--	--	--	NO
Arsenic	25.0 - 132	0 / 5	--	--	--	55.3	23.9	78.1	47.3	36.0	-- / --	3.67	YES	--	-- / --	--	2.17	1.54	NO[4]
Barium	-- - --	5 / 5	5.74	16.1	VWW06-SW004-0211	10.1	4.56	14.4	9.27	200	0 / 5	0.08	NO	--	-- / --	--	--	--	NO
Beryllium	4.80 - 4.80	0 / 5	--	--	--	2.40	0.0	2.40	2.40	100	-- / --	0.05	NO	--	-- / --	--	--	--	NO
Cadmium	10.0 - 28.8	1 / 5	15.9	15.9	VWW06-SW004-0211	11.9	4.46	16.2	11.1	8.85	1 / 5	1.80	YES	12.5	1 / 5	1.27	1.83	1.35	NO
Calcium [3]	-- - --	5 / 5	419,000	523,000	VWW06-SW004-0211	478,600	39,437	516,199	477,259	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chromium	17.2 - 17.2	0 / 5	--	--	--	8.60	0.0	8.60	8.60	50.4	-- / --	0.34	NO	--	-- / --	--	--	--	NO
Cobalt	10.0 - 14.8	0 / 5	--	--	--	6.92	1.07	7.94	6.84	23.0	-- / --	0.64	NO	--	-- / --	--	--	--	NO
Copper	25.0 - 108	0 / 5	--	--	--	45.7	18.6	63.4	40.3	3.73	-- / --	29.0	YES	152	-- / --	0.71	--	--	NO
Iron	220 - 220	3 / 5	392	813	VWW06-SW004-0211	403	306	695	296	50.0	3 / 5	16.3	YES	5,270	0 / 5	0.15	--	--	NO
Lead	10.0 - 20.0	0 / 5	--	--	--	9.00	2.24	11.1	8.71	8.52	-- / --	2.35	YES	--	-- / --	--	1.31	1.06	NO[4]
Magnesium [3]	-- - --	5 / 5	1,180,000	1,360,000	VWW06-SW004-0211	1,294,000	76,026	1,366,483	1,292,172	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Manganese	14.0 - 14.0	0 / 5	--	--	--	7.00	0.0	7.00	7.00	100	-- / --	0.14	NO	--	-- / --	--	--	--	NO
Mercury	0.074 - 0.074	1 / 5	0.041	0.041	VWW06-SW003-0211	0.038	0.0018	0.040	0.038	1.11	0 / 5	0.04	NO	--	-- / --	--	--	--	NO

TABLE F-23
Screening Statistics - Surface Water - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Nickel	37.2 - 37.2	0 / 5	--	--	--	18.6	0.0	18.6	18.6	8.28	-- / --	4.49	YES	--	-- / --	--	2.25	2.25	NO[4]
Potassium [3]	-- - --	5 / 5	433,000	544,000	VWW06-SW004-0211	495,800	41,776	535,628	494,349	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Selenium	164 - 164	0 / 5	--	--	--	82.0	0.0	82.0	82.0	71.1	-- / --	2.31	YES	126	-- / --	1.30	1.15	1.15	NO[4]
Silver	2.50 - 20.8	0 / 5	--	--	--	6.99	4.69	11.5	5.12	2.24	-- / --	9.29	YES	--	-- / --	--	5.12	3.12	NO[4]
Sodium [3]	-- - --	5 / 5	10,800,000	15,900,000	VWW06-SW004-0211	12,120,000	2,128,849	14,149,626	11,989,029	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Thallium	176 - 176	1 / 5	121	121	VWW06-SW003-0211	94.6	14.8	109	93.8	21.3	1 / 5	5.68	YES	--	-- / --	--	5.10	4.44	NO
Vanadium	17.6 - 17.6	0 / 5	--	--	--	8.80	0.0	8.80	8.80	50.0	-- / --	0.35	NO	--	-- / --	--	--	--	NO
Zinc	160 - 160	0 / 5	--	--	--	80.0	0.0	80.0	80.0	85.6	-- / --	1.87	YES	--	-- / --	--	0.93	0.93	NO
Dissolved Metals (UG/L)																			
Aluminum	-- - --	4 / 4	387	1,740	VWW06-SW004-0211	1,199	582	1,884	1,045	87.0	4 / 4	20.0	YES	242	4 / 4	7.19	21.7	13.8	YES
Antimony	10.0 - 100	0 / 5	--	--	--	33.0	23.3	55.3	22.9	500	-- / --	0.20	NO	--	-- / --	--	--	--	NO
Arsenic	132 - 132	0 / 5	--	--	--	66.2	0.0	66.2	66.2	36.0	-- / --	3.68	YES	--	-- / --	--	1.84	1.84	NO[4]
Barium	-- - --	5 / 5	6.48	19.6	VWW06-SW004-0211	11.6	5.69	17.0	10.6	200	0 / 5	0.10	NO	--	-- / --	--	--	--	NO
Beryllium	4.80 - 4.80	0 / 5	--	--	--	2.40	0.0	2.40	2.40	100	-- / --	0.05	NO	--	-- / --	--	--	--	NO
Cadmium	10.0 - 28.8	0 / 5	--	--	--	12.5	4.20	16.5	11.7	8.80	-- / --	3.27	YES	--	-- / --	--	1.88	1.42	NO[4]
Calcium [3]	-- - --	5 / 5	416,000	484,000	VWW06-SW005-0211	440,400	31,864	470,779	439,497	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chromium	17.2 - 17.2	0 / 5	--	--	--	8.60	0.0	8.60	8.60	50.0	-- / --	0.34	NO	--	-- / --	--	--	--	NO
Cobalt	14.8 - 14.8	0 / 5	--	--	--	7.40	0.0	7.40	7.40	23.0	-- / --	0.64	NO	--	-- / --	--	--	--	NO
Copper	108 - 108	0 / 5	--	--	--	54.0	0.0	54.0	54.0	3.10	-- / --	34.8	YES	26.0	-- / --	4.15	17.4	17.4	NO[4]
Iron	220 - 220	1 / 5	293	293	VWW06-SW004-0211	147	81.8	225	134	50.0	1 / 5	5.86	YES	--	-- / --	--	4.49	2.93	YES
Lead	10.0 - 20.0	0 / 5	--	--	--	9.00	2.24	11.1	8.71	8.10	-- / --	2.47	YES	11.9	-- / --	1.68	1.37	1.11	NO[4]
Magnesium [3]	-- - --	5 / 5	1,080,000	1,320,000	VWW06-SW003-0211	1,252,000	97,314	1,344,778	1,248,756	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Manganese	14.0 - 14.0	0 / 5	--	--	--	7.00	0.0	7.00	7.00	100	-- / --	0.14	NO	--	-- / --	--	--	--	NO
Mercury	0.074 - 0.074	2 / 5	0.044	0.047	VWW06-SW005-0211	0.040	0.0049	0.045	0.040	0.94	0 / 5	0.05	NO	--	-- / --	--	--	--	NO
Nickel	37.2 - 37.2	0 / 5	--	--	--	18.6	0.0	18.6	18.6	8.20	-- / --	4.54	YES	--	-- / --	--	2.27	2.27	NO[4]
Potassium [3]	-- - --	5 / 5	435,000	498,000	VWW06-SW005-0211	455,400	27,943	482,040	454,732	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Selenium	164 - 164	0 / 5	--	--	--	82.0	0.0	82.0	82.0	71.0	-- / --	2.31	YES	126	-- / --	1.30	1.15	1.15	NO[4]
Silver	2.50 - 20.8	0 / 5	--	--	--	8.57	4.09	12.5	6.81	2.24	-- / --	9.29	YES	--	-- / --	--	5.57	3.83	NO[4]
Sodium [3]	-- - --	5 / 5	10,700,000	11,000,000	VWW06-SW003-0211	10,880,000	130,384	11,004,307	10,879,373	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Thallium	176 - 176	0 / 5	--	--	--	88.0	0.0	88.0	88.0	21.3	-- / --	8.26	YES	--	-- / --	--	4.13	4.13	NO[4]
Vanadium	17.6 - 17.6	0 / 5	--	--	--	8.80	0.0	8.80	8.80	50.0	-- / --	0.35	NO	--	-- / --	--	--	--	NO
Zinc	160 - 160	0 / 5	--	--	--	80.0	0.0	80.0	80.0	81.0	-- / --	1.98	YES	--	-- / --	--	0.99	0.99	NO
Other Parameters (MG/L)																			
Chromium (hexavalent)	-- - --	5 / 5	0.012	0.041	VWW06-SW005-0211	0.026	0.012	0.037	0.024	0.0504	0 / 5	0.81	NO	--	-- / --	--	--	--	NO
Dissolved Other Parameters (MG/L)																			
Chromium (hexavalent)	-- - --	5 / 5	0.0090	0.014	VWW06-SW005-0211	0.012	0.0019	0.014	0.012	0.0500	0 / 5	0.28	NO	--	-- / --	--	--	--	NO

NSV - No Screening Value
1 - Count of detected samples exceeding or equaling screening value
2 - Shaded cells indicate hazard quotient based on reporting limits
3 - Macronutrient - Not considered to be a COPC
4 - See Section 1.6 (uncertainties)
Yellow shading indicates freshwater screening value used for detected chemicals lacking marine surface water screening values

TABLE F-24
Screening Statistics - 2011 Sediment Samples - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Volatile Organic Compounds (UG/KG)																			
1,1,1-Trichloroethane	0.67 - 2.20	0 / 8	--	--	--	0.61	0.23	0.77	0.58	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2,2-Tetrachloroethane	1.20 - 4.10	0 / 8	--	--	--	1.12	0.44	1.41	1.05	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.30 - 4.40	0 / 8	--	--	--	1.21	0.47	1.52	1.14	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloroethane	1.70 - 5.70	0 / 8	--	--	--	1.56	0.61	1.97	1.47	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethane	0.71 - 2.40	0 / 8	--	--	--	0.65	0.26	0.82	0.61	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethene	0.71 - 2.40	0 / 8	--	--	--	0.65	0.26	0.82	0.61	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2,3-Trichlorobenzene	1.30 - 4.30	0 / 8	--	--	--	1.16	0.46	1.47	1.09	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2,4-Trichlorobenzene	1.30 - 4.40	0 / 8	--	--	--	1.21	0.47	1.52	1.14	4.80	-- / --	0.92	NO	--	-- / --	--	--	--	NO
1,2-Dibromo-3-chloropropane	5.20 - 17.5	0 / 8	--	--	--	4.78	1.88	6.03	4.50	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dibromoethane	1.70 - 5.70	0 / 8	--	--	--	1.56	0.61	1.97	1.47	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dichlorobenzene	1.20 - 3.90	0 / 8	--	--	--	1.08	0.41	1.35	1.02	13.0	-- / --	0.30	NO	--	-- / --	--	--	--	NO
1,2-Dichloroethane	2.10 - 7.00	0 / 8	--	--	--	1.90	0.75	2.40	1.79	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dichloropropane	1.30 - 4.40	0 / 8	--	--	--	1.21	0.47	1.52	1.14	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,3-Dichlorobenzene	0.94 - 3.20	0 / 8	--	--	--	0.87	0.34	1.09	0.81	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,4-Dichlorobenzene	1.40 - 4.60	0 / 8	--	--	--	1.25	0.49	1.58	1.18	110	-- / --	0.04	NO	--	-- / --	--	--	--	NO
2-Butanone	2.90 - 4.40	6 / 8	5.60	47.3	VWW06-SD009-0211	15.9	15.0	26.0	9.62	NSV	-- / --	NSV	YES	--	-- / --	--	NSV	NSV	YES
2-Hexanone	2.70 - 9.10	0 / 8	--	--	--	2.48	0.98	3.14	2.34	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Methyl-2-pentanone	3.30 - 11.2	0 / 8	--	--	--	3.05	1.21	3.86	2.87	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Acetone	2.70 - 2.70	7 / 8	29.6	158	VWW06-SD009-0211	73.5	48.6	106	45.2	NSV	-- / --	NSV	YES	--	-- / --	--	NSV	NSV	YES
Benzene	1.00 - 3.50	0 / 8	--	--	--	0.95	0.38	1.20	0.89	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromochloromethane	1.90 - 6.30	0 / 8	--	--	--	1.72	0.67	2.17	1.62	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromodichloromethane	0.67 - 2.20	0 / 8	--	--	--	0.61	0.23	0.77	0.58	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromoform	0.96 - 3.20	0 / 8	--	--	--	0.87	0.34	1.09	0.82	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromomethane	2.10 - 7.00	0 / 8	--	--	--	1.90	0.75	2.40	1.79	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Carbon disulfide	2.10 - 4.40	3 / 8	3.40	13.0	VWW06-SD009-0211	3.51	3.97	6.17	2.46	NSV	-- / --	NSV	YES	--	-- / --	--	NSV	NSV	YES
Carbon tetrachloride	1.20 - 4.20	0 / 8	--	--	--	1.14	0.45	1.45	1.07	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chlorobenzene	0.73 - 2.40	0 / 8	--	--	--	0.67	0.26	0.84	0.63	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chloroethane	1.50 - 5.20	0 / 8	--	--	--	1.41	0.56	1.78	1.32	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chloroform	1.10 - 3.80	0 / 8	--	--	--	1.03	0.41	1.30	0.96	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chloromethane	0.79 - 2.70	0 / 8	--	--	--	0.73	0.29	0.92	0.69	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
cis-1,2-Dichloroethene	1.30 - 4.30	0 / 8	--	--	--	1.18	0.46	1.49	1.12	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
cis-1,3-Dichloropropene	0.88 - 2.90	0 / 8	--	--	--	0.81	0.31	1.01	0.76	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Cyclohexane	2.10 - 7.00	0 / 8	--	--	--	1.90	0.75	2.40	1.79	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dibromochloromethane	0.96 - 3.20	0 / 8	--	--	--	0.87	0.34	1.09	0.82	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dichlorodifluoromethane (Freon-12)	1.20 - 4.20	0 / 8	--	--	--	1.14	0.45	1.45	1.07	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Ethylbenzene	1.40 - 4.80	0 / 8	--	--	--	1.31	0.51	1.65	1.24	4.00	-- / --	1.20	YES	--	-- / --	--	0.41	0.33	NO
Isopropylbenzene	1.20 - 4.20	0 / 8	--	--	--	1.14	0.45	1.45	1.07	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methyl acetate	4.20 - 14.0	0 / 8	--	--	--	3.83	1.49	4.83	3.61	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylcyclohexane	0.90 - 3.00	0 / 8	--	--	--	0.82	0.32	1.03	0.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylene chloride	2.50 - 8.40	0 / 8	--	--	--	2.29	0.90	2.90	2.16	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methyl-tert-butyl ether (MTBE)	0.90 - 3.00	0 / 8	--	--	--	0.82	0.32	1.03	0.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Styrene	0.58 - 2.00	0 / 8	--	--	--	0.54	0.22	0.68	0.51	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Tetrachloroethene	4.10 - 6.50	6 / 8	1.60	2.80	VWW06-SD003-0211	2.26	0.54	2.63	2.21	57.0	0 / 8	0.05	NO	--	-- / --	--	--	--	NO
Toluene	0.60 - 2.00	0 / 8	--	--	--	0.55	0.21	0.69	0.52	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
trans-1,2-Dichloroethene	0.81 - 2.70	0 / 8	--	--	--	0.74	0.29	0.93	0.70	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
trans-1,3-Dichloropropene	2.10 - 7.00	0 / 8	--	--	--	1.90	0.75	2.40	1.79	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Trichloroethene	0.92 - 3.10	0 / 8	--	--	--	0.85	0.34	1.07	0.79	41.0	-- / --	0.08	NO	--	-- / --	--	--	--	NO
Trichlorofluoromethane (Freon-11)	0.92 - 3.10	0 / 8	--	--	--	0.85	0.34	1.07	0.79	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Vinyl chloride	1.20 - 4.20	0 / 8	--	--	--	1.14	0.45	1.45	1.07	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Xylene, total	1.40 - 4.80	0 / 8	--	--	--	1.30	0.52	1.65	1.22	4.00	-- / --	1.20	YES	--	-- / --	--	0.41	0.33	NO
Semivolatile Organic Compounds (UG/KG)																			
1-Methylnaphthalene	2.60 - 36.4	0 / 8	--	--	--	9.39	5.98	13.4	7.00	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2-Methylnaphthalene	2.60 - 36.4	0 / 8	--	--	--	9.39	5.98	13.4	7.00	70.0	-- / --	0.52	NO	--	-- / --	--	--	--	NO
Acenaphthene	2.60 - 36.4	1 / 8	11.9	11.9	VWW06-SD004-0211	9.65	6.05	13.7	7.18	16.0	0 / 8	0.74	NO	--	-- / --	--	--	--	NO
Acenaphthylene	2.60 - 33.1	1 / 8	20.0	20.0	VWW06-SD006-0211	9.61	6.38	13.9	7.09	44.0	0 / 8	0.45	NO	--	-- / --	--	--	--	NO
Anthracene	2.60 - 33.1	2 / 8	18.8	28.2	VWW06-SD004-0211	11.8	9.03	17.8	8.03	85.3	0 / 8	0.33	NO	--	-- / --	--	--	--	NO
Benzo(a)anthracene	2.70 - 2.70	7 / 8	4.70	102	VWW06-SD006-0211	40.1	34.9	63.4	21.7	261	0 / 8	0.39	NO	--	-- / --	--	--	--	NO

TABLE F-24
Screening Statistics - 2011 Sediment Samples - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Benzo(a)pyrene	3.30 - 3.30	7 / 8	6.70	110	VWW06-SD006-0211	51.0	41.8	79.0	27.9	430	0 / 8	0.26	NO	--	-- / --	--	--	--	NO
Benzo(b)fluoranthene	3.30 - 3.30	7 / 8	10.7	160	VWW06-SD006-0211	76.9	63.7	120	40.3	1,800	0 / 8	0.09	NO	--	-- / --	--	--	--	NO
Benzo(g,h,i)perylene	3.30 - 21.3	4 / 8	38.8	62.2	VWW06-SD006-0211	30.7	27.1	48.8	15.9	670	0 / 8	0.09	NO	--	-- / --	--	--	--	NO
Benzo(k)fluoranthene	3.30 - 3.30	7 / 8	4.20	63.4	VWW06-SD006-0211	28.9	23.8	44.9	17.3	1,800	0 / 8	0.04	NO	--	-- / --	--	--	--	NO
Chrysene	2.50 - 2.50	7 / 8	6.80	92.4	VWW06-SD006-0211	42.3	35.7	66.2	23.1	384	0 / 8	0.24	NO	--	-- / --	--	--	--	NO
Dibenz(a,h)anthracene	3.30 - 45.6	0 / 8	--	--	--	11.8	7.50	16.8	8.78	63.4	-- / --	0.72	NO	--	-- / --	--	--	--	NO
Fluoranthene	2.60 - 2.60	7 / 8	8.50	122	VWW06-SD006-0211	52.5	44.4	82.2	28.3	600	0 / 8	0.20	NO	--	-- / --	--	--	--	NO
Fluorene	2.60 - 36.4	1 / 8	11.6	11.6	VWW06-SD004-0211	9.61	6.03	13.7	7.15	19.0	0 / 8	0.61	NO	--	-- / --	--	--	--	NO
Indeno(1,2,3-cd)pyrene	3.30 - 21.3	4 / 8	34.9	61.4	VWW06-SD006-0211	28.5	25.0	45.2	15.2	600	0 / 8	0.10	NO	--	-- / --	--	--	--	NO
Naphthalene	2.60 - 36.4	0 / 8	--	--	--	9.39	5.98	13.4	7.00	160	-- / --	0.23	NO	--	-- / --	--	--	--	NO
PAH (HMW)	13.8 - 13.8	7 / 8	48.1	780	VWW06-SD006-0211	369	300	570	190	1,700	0 / 8	0.46	NO	--	-- / --	--	--	--	NO
PAH (LMW)	10.4 - 10.4	7 / 8	22.9	284	VWW06-SD004-0211	137	105	207	81.4	552	0 / 8	0.51	NO	--	-- / --	--	--	--	NO
PAH (total)	24.2 - 24.2	7 / 8	70.9	1,032	VWW06-SD006-0211	506	398	772	274	4,022	0 / 8	0.26	NO	--	-- / --	--	--	--	NO
Phenanthrene	2.60 - 4.10	6 / 8	8.70	111	VWW06-SD004-0211	24.4	36.3	48.7	10.6	240	0 / 8	0.46	NO	--	-- / --	--	--	--	NO
Pyrene	2.60 - 2.60	7 / 8	7.30	125	VWW06-SD004-0211	60.0	48.5	92.4	31.5	665	0 / 8	0.19	NO	--	-- / --	--	--	--	NO
Pesticide/Polychlorinated Biphenyls (UG/KG)																			
4,4'-DDD	1.00 - 3.20	6 / 8	2.80	59.0	VWW06-SD003-0211	15.2	20.8	29.2	5.95	1.22	6 / 8	48.4	YES	--	-- / --	--	23.9	12.5	YES
4,4'-DDE	0.54 - 1.70	6 / 8	5.90	94.0	VWW06-SD003-0211	26.5	34.9	49.9	8.02	2.20	6 / 8	42.7	YES	1.30	6 / 8	72.3	22.7	12.1	YES
4,4'-DDT	0.76 - 3.70	1 / 8	3.20	3.20	VWW06-SD003-0211	1.35	0.85	1.92	1.16	1.19	1 / 8	2.69	YES	--	-- / --	--	1.61	1.14	YES
Aldrin	0.30 - 1.50	0 / 8	--	--	--	0.43	0.16	0.54	0.40	9.50	-- / --	0.16	NO	--	-- / --	--	--	--	NO
alpha-BHC	1.50 - 7.40	0 / 8	--	--	--	2.17	0.80	2.71	2.01	0.32	-- / --	23.1	YES	--	-- / --	--	8.46	6.78	(YES)
alpha-Chlordane	0.32 - 1.60	0 / 8	--	--	--	0.46	0.17	0.58	0.43	2.26	-- / --	0.71	NO	--	-- / --	--	--	--	NO
Aroclor-1016	26.0 - 64.0	0 / 8	--	--	--	19.5	5.56	23.2	18.9	48.0	-- / --	1.33	YES	--	-- / --	--	0.48	0.41	NO
Aroclor-1221	24.0 - 59.0	0 / 8	--	--	--	18.0	5.12	21.4	17.5	48.0	-- / --	1.23	YES	--	-- / --	--	0.45	0.38	NO
Aroclor-1232	30.0 - 74.0	0 / 8	--	--	--	22.6	6.41	26.9	22.0	48.0	-- / --	1.54	YES	--	-- / --	--	0.56	0.47	NO
Aroclor-1242	22.0 - 54.0	0 / 8	--	--	--	16.5	4.70	19.6	16.0	48.0	-- / --	1.13	YES	--	-- / --	--	0.41	0.34	NO
Aroclor-1248	22.0 - 54.0	0 / 8	--	--	--	16.5	4.70	19.6	16.0	48.0	-- / --	1.13	YES	--	-- / --	--	0.41	0.34	NO
Aroclor-1254	19.0 - 30.0	5 / 8	30.0	260	VWW06-SD009-0211	71.1	90.6	132	37.6	63.3	2 / 8	4.11	YES	--	-- / --	--	2.08	1.12	YES
Aroclor-1260	12.0 - 30.0	0 / 8	--	--	--	9.19	2.60	10.9	8.91	48.0	-- / --	0.63	NO	--	-- / --	--	--	--	NO
beta-BHC	0.30 - 1.50	0 / 8	--	--	--	0.43	0.16	0.54	0.40	0.32	-- / --	4.69	YES	--	-- / --	--	1.70	1.35	(YES)
delta-BHC	0.56 - 2.80	0 / 8	--	--	--	0.80	0.31	1.01	0.74	0.32	-- / --	8.75	YES	--	-- / --	--	3.15	2.51	(YES)
Dieldrin	0.32 - 1.60	0 / 8	--	--	--	0.46	0.17	0.58	0.43	0.72	-- / --	2.24	YES	--	-- / --	--	0.81	0.65	NO
Endosulfan I	0.44 - 2.20	0 / 8	--	--	--	0.63	0.24	0.80	0.59	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Endosulfan II	0.58 - 2.80	0 / 8	--	--	--	0.83	0.30	1.03	0.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Endosulfan sulfate	0.40 - 2.00	0 / 8	--	--	--	0.57	0.22	0.72	0.53	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Endrin	0.52 - 2.60	0 / 8	--	--	--	0.75	0.29	0.94	0.69	0.020	-- / --	130	YES	--	-- / --	--	46.8	37.3	(YES)
Endrin aldehyde	0.72 - 3.50	0 / 8	--	--	--	1.02	0.38	1.27	0.95	0.020	-- / --	175	YES	--	-- / --	--	63.7	51.0	(YES)
Endrin ketone	0.42 - 2.10	0 / 8	--	--	--	0.61	0.23	0.76	0.56	0.020	-- / --	105	YES	--	-- / --	--	38.0	30.4	(YES)
gamma-BHC (Lindane)	0.40 - 2.00	0 / 8	--	--	--	0.57	0.22	0.72	0.53	0.32	-- / --	6.25	YES	--	-- / --	--	2.24	1.78	(YES)
gamma-Chlordane	0.34 - 1.70	0 / 8	--	--	--	0.48	0.18	0.61	0.45	2.26	-- / --	0.75	NO	--	-- / --	--	--	--	NO
Heptachlor	0.40 - 2.00	0 / 8	--	--	--	0.57	0.22	0.72	0.53	0.30	-- / --	6.67	YES	--	-- / --	--	2.38	1.90	(YES)
Heptachlor epoxide	0.30 - 1.50	0 / 8	--	--	--	0.43	0.16	0.54	0.40	0.30	-- / --	5.00	YES	--	-- / --	--	1.81	1.44	(YES)
Methoxychlor	0.54 - 2.70	0 / 8	--	--	--	0.78	0.29	0.98	0.73	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Toxaphene	50.0 - 250	0 / 8	--	--	--	72.5	27.3	90.8	67.2	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Inorganics (MG/KG)																			
Aluminum	-- - --	8 / 8	2,120	14,400	VWW06-SD009-0211	7,818	3,681	10,283	6,928	18,000	0 / 8	0.80	NO	--	-- / --	--	--	--	NO
Antimony	0.46 - 0.72	5 / 8	0.40	3.88	VWW06-SD006-0211	1.46	1.45	2.43	0.86	2.00	3 / 8	1.94	YES	--	-- / --	--	1.22	0.73	NO
Arsenic	-- - --	8 / 8	1.20	7.80	VWW06-SD009-0211	3.49	2.22	4.98	2.89	8.20	0 / 8	0.95	NO	--	-- / --	--	--	--	NO
Barium	-- - --	8 / 8	7.39	33.8	VWW06-SD009-0211	17.4	8.62	23.1	15.7	48.0	0 / 8	0.70	NO	--	-- / --	--	--	--	NO
Beryllium	2.73 - 5.01	0 / 8	--	--	--	1.66	0.37	1.91	1.63	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Cadmium	-- - --	8 / 8	0.78	5.69	VWW06-SD009-0211	2.31	1.71	3.46	1.87	1.20	6 / 8	4.74	YES	0.175	8 / 8	32.5	2.88	1.93	YES
Calcium [3]	-- - --	8 / 8	72,900	140,000	VWW06-SD006-0211	102,150	20,194	115,677	100,448	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chromium	-- - --	8 / 8	3.30	37.0	VWW06-SD009-0211	15.2	10.3	22.0	12.2	81.0	0 / 8	0.46	NO	--	-- / --	--	--	--	NO
Cobalt	-- - --	8 / 8	0.93	9.00	VWW06-SD009-0211	4.47	2.80	6.35	3.62	10.0	0 / 8	0.90	NO	--	-- / --	--	--	--	NO
Copper	-- - --	8 / 8	5.08	204	VWW06-SD009-0211	77.1	65.5	121	48.7	34.0	6 / 8	6.00	YES	54.1	6 / 8	3.77	3.56	2.27	YES
Iron	-- - --	8 / 8	3,310	45,900	VWW06-SD009-0211	20,445	13,207	29,292	16,013	220,000	0 / 8	0.21	NO	--	-- / --	--	--	--	NO
Lead	-- - --	8 / 8	6.80	612	VWW06-SD009-0211	205	213	348	97.0	46.7	6 / 8	13.1	YES	15.1	6 / 8	40.5	7.45	4.39	YES

TABLE F-24
Screening Statistics - 2011 Sediment Samples - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Magnesium [3]	-- - --	8 / 8	3,110	11,900	VWW06-SD009-0211	6,236	2,890	8,172	5,699	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Manganese	-- - --	8 / 8	60.1	356	VWW06-SD009-0211	200	106	271	171	260	3 / 8	1.37	YES	455	0 / 8	0.78	--	--	NO
Mercury	-- - --	8 / 8	0.0074	0.13	VWW06-SD009-0211	0.055	0.039	0.081	0.042	0.15	0 / 8	0.86	NO	--	-- / --	--	--	--	NO
Nickel	2.85 - 3.55	6 / 8	6.41	19.1	VWW06-SD009-0211	8.17	5.68	12.0	6.13	20.9	0 / 8	0.91	NO	--	-- / --	--	--	--	NO
Potassium [3]	-- - --	8 / 8	699	3,450	VWW06-SD009-0211	1,682	813	2,227	1,534	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Selenium	0.47 - 1.40	0 / 8	--	--	--	0.40	0.15	0.50	0.38	1.00	-- / --	1.40	YES	4.34	-- / --	0.32	--	--	NO
Silver	0.30 - 0.79	2 / 8	0.25	0.30	VWW06-SD003-0211	0.25	0.074	0.30	0.24	1.00	0 / 8	0.30	NO	--	-- / --	--	--	--	NO
Sodium [3]	-- - --	8 / 8	8,010	27,800	VWW06-SD009-0211	12,985	6,213	17,147	12,089	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Thallium	5.80 - 10.6	1 / 8	5.17	5.17	VWW06-SD005-0211	3.81	0.92	4.42	3.72	NSV	-- / --	NSV	YES	1.69	1 / 8	3.06	NSV	NSV	YES
Vanadium	-- - --	8 / 8	9.58	66.1	VWW06-SD009-0211	35.1	19.4	48.1	30.1	57.0	2 / 8	1.16	YES	71.7	0 / 8	0.92	--	--	NO
Zinc	-- - --	8 / 8	11.0	849	VWW06-SD009-0211	274	269	455	147	150	6 / 8	5.66	YES	87.3	6 / 8	9.73	3.03	1.83	YES
Other Parameters																			
Chromium (hexavalent) (UG/KG)	836 - 891	6 / 8	1,840	12,000	VWW06-SD009-0211	3,915	3,909	6,534	2,307	NSV	-- / --	NSV	YES	219,000	0 / 8	0.05	--	--	NO
pH	-- - --	8 / 8	7.45	8.11	VWW06-SD008-0211	7.80	0.18	7.92	7.79	--	-- / --	--	--	--	-- / --	--	--	--	--
Total organic carbon (TOC) (MG/KG)	-- - --	8 / 8	6,700	24,000	VWW06-SD009-0211	14,275	5,618	18,038	13,231	--	-- / --	--	--	--	-- / --	--	--	--	--

NSV - No Screening Value
1 - Count of detected samples exceeding or equaling Screening Value
2 - Shaded cells indicate hazard quotient based on reporting limits
3 - Macronutrient - Not considered to be a COPC

TABLE F-25
Comparison of Sediment Step 3A COPC Concentrations With Equilibrium Partitioning-Based Sediment Values - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Frequency of Detection	Maximum Concentration	95% UCL (Norm)	Arithmetic Mean	EqP-Based Value	Type	Reference	Mean TOC (%)	Normalized EqP-Based Value[1]	Frequency of Exceedance	Maximum Hazard Quotient	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Volatile Organic Compounds (UG/KG)														
2-Butanone	6 / 8	47.3	26.0	15.9	270	Fresh	Jones et al., 1997	1.43	386	0 / 8	0.12	0.07	0.04	NO
Acetone	7 / 8	158	106	73.5	3,278	Marine	Attachment B	1.43	4,679	0 / 8	0.03	0.02	0.02	NO
Carbon disulfide	3 / 8	13.0	6.17	3.51	0.85	Fresh	Jones et al., 1997	1.43	1.22	3 / 8	10.70	5.08	2.89	YES
Pesticide/Polychlorinated Biphenyls (UG/KG)														
4,4'-DDD	6 / 8	59.0	29.2	15.2	9.92	Marine	Attachment B	1.43	14.2	2 / 8	4.17	2.06	1.08	NO
4,4'-DDE	6 / 8	94.0	49.9	26.5	44.2	Marine	Attachment B	1.43	63.1	2 / 8	1.49	0.79	0.42	NO
4,4'-DDT	1 / 8	3.20	1.92	1.35	26.3	Marine	Attachment B	1.43	37.5	0 / 8	0.09	0.05	0.04	NO
alpha-BHC	0 / 8	7.40	2.71	2.17	1,360	Marine	USEPA 2006b	1.43	1,941	-- / --	0.004	0.001	0.001	NO
Aroclor-1254	5 / 8	260	132	71.1	120	Marine	Washington State 1995	1.43	171	1 / 8	1.52	0.77	0.42	NO
beta-BHC	0 / 8	1.50	0.54	0.43	1,360	Marine	alpha-BHC value	1.43	1,941	-- / --	0.0008	0.0003	0.0002	NO
delta-BHC	0 / 8	2.80	1.01	0.80	1,360	Marine	alpha-BHC value	1.43	1,941	-- / --	0.0014	0.0005	0.0004	NO
Endrin	0 / 8	2.60	0.94	0.75	3.50	Marine	USEPA 1996a	1.43	5.00	-- / --	0.52	0.19	0.15	NO
Endrin aldehyde	0 / 8	3.50	1.27	1.02	3.50	Marine	Endrin value	1.43	5.00	-- / --	0.70	0.26	0.20	NO
Endrin ketone	0 / 8	2.10	0.76	0.61	3.50	Marine	Endrin value	1.43	5.00	-- / --	0.42	0.15	0.12	NO
gamma-BHC (Lindane)	0 / 8	2.00	0.72	0.57	1,360	Marine	alpha-BHC value	1.43	1,941	-- / --	0.0010	0.0004	0.0003	NO
Heptachlor	0 / 8	2.00	0.72	0.57	2.96	Marine	Heptachlor epoxide value	1.43	4.23	-- / --	0.47	0.17	0.13	NO
Heptachlor epoxide	0 / 8	1.50	0.54	0.43	2.96	Marine	Attachment B	1.43	4.23	-- / --	0.35	0.13	0.10	NO
Inorganics (MG/KG)														
Cadmium	8 / 8	5.69	3.46	2.31	--	--	--	--	--	-- / --	--	--	--	YES
Copper	8 / 8	204	121	77.1	--	--	--	--	--	-- / --	--	--	--	YES
Lead	8 / 8	612	348	205	--	--	--	--	--	-- / --	--	--	--	YES
Thallium	1 / 8	5.17	4.42	3.81	--	--	--	--	--	-- / --	--	--	--	YES
Zinc	8 / 8	849	455	274	--	--	--	--	--	-- / --	--	--	--	YES

Shaded cells indicate ratios based upon reporting limits
NSV - No Screening Value

TABLE F-26
Hazard Quotients for Aquatic Food Web Exposures - Step 2 (Screening) - Maximum - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Green Heron			Spotted Sandpiper			Fishing Bat		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Metals									
Arsenic	0.04	0.02	0.01	0.40	0.26	0.16	0.87	0.39	0.17
Cadmium	0.16	0.07	0.03	3.74	1.67	0.75	0.36	0.11	0.04
Chromium	0.10	0.04	0.02	2.80	1.25	0.56	0.13	0.06	0.03
Copper	0.94	0.54	0.31	120.80	69.89	40.43	0.81	0.63	0.49
Lead	3.84	1.72	0.77	25.43	11.37	5.09	3.76	2.74	1.99
Mercury	4.23	2.44	1.41	4.49	2.59	1.50	4.11	1.84	0.82
Nickel	0.53	0.24	0.11	0.36	0.16	0.07	2.50	1.77	1.25
Selenium	0.14	0.06	0.03	5.92	4.19	2.96	1.56	1.21	0.94
Silver	0.01	0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01
Zinc	3.11	1.39	0.62	18.76	8.39	3.75	3.25	1.46	0.65
Polychlorinated Biphenyls									
Aroclor-1016	0.25	0.11	0.05	0.28	0.12	0.06	3.25	1.46	0.65
Aroclor-1221	0.23	0.10	0.05	0.26	0.11	0.05	3.00	1.34	0.60
Aroclor-1232	0.29	0.13	0.06	0.32	0.14	0.06	3.76	1.68	0.75
Aroclor-1242	0.21	0.09	0.04	0.23	0.10	0.05	2.75	1.23	0.55
Aroclor-1248	0.21	0.09	0.04	0.23	0.10	0.05	2.75	1.23	0.55
Aroclor-1254	1.00	0.45	0.20	1.12	0.50	0.22	13.22	5.91	2.64
Aroclor-1260	0.12	0.05	0.02	0.13	0.06	0.03	1.53	0.68	0.31
Pesticides									
4,4'-DDD	0.95	0.30	0.09	1.12	0.50	0.22	2.31	1.03	0.46
4,4'-DDE	16.92	5.35	1.69	1.78	0.80	0.36	41.28	18.46	8.26
4,4'-DDT	0.06	0.02	0.01	<0.01	<0.01	<0.01	0.14	0.06	0.03
Aldrin	0.05	0.02	0.01	0.01	<0.01	<0.01	0.05	0.02	0.01
alpha-BHC	0.07	0.04	0.02	0.03	0.02	0.01	0.03	0.02	0.02
alpha-Chlordane	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
beta-BHC	0.02	0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01
delta-BHC	0.03	0.01	0.01	0.01	0.01	<0.01	0.01	0.01	0.01
Dieldrin	0.38	0.05	0.01	0.03	<0.01	<0.01	2.15	1.52	1.08
Endosulfan I	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.10	0.04	0.02
Endosulfan II	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	0.06	0.03
Endrin	0.05	0.02	0.01	0.01	<0.01	<0.01	0.10	0.04	0.02
gamma-BHC (Lindane)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-Chlordane	0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	0.02	0.01	<0.01	<0.01	<0.01	<0.01	0.07	0.03	0.01
Heptachlor epoxide	0.02	0.01	<0.01	<0.01	<0.01	<0.01	0.05	0.02	0.01
Methoxychlor	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toxaphene	1.41	0.63	0.28	0.09	0.04	0.02	0.21	0.09	0.04
Volatile/Semivolatile Organics									
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	<0.01	<0.01	<0.01
1,2,4-Trichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,4-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	0.01	<0.01
Benzo(a)pyrene	<0.01	<0.01	<0.01	0.03	0.01	0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	0.01	<0.01

TABLE F-26
Hazard Quotients for Aquatic Food Web Exposures - Step 2 (Screening) - Maximum - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Green Heron			Spotted Sandpiper			Fishing Bat		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Dibenz(a,h)anthracene	<0.01	<0.01	<0.01	0.03	0.01	0.01	<0.01	<0.01	<0.01
Fluoranthene	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01
Phenanthrene	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	<0.01	<0.01	<0.01	0.07	0.03	0.01	0.04	0.02	0.01

NA - TRV Not Available
Shaded cells indicate HQ > 1

TABLE F-27

Hazard Quotients for Aquatic Food Web Exposures - Step 3A (Baseline) - 95% UCL - SWMU 6 Lagoon

SWMU 6 Feasibility Study Report

Former NASD, Vieques, Puerto Rico

Chemical	Green Heron			Spotted Sandpiper			Fishing Bat		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Metals									
Cadmium	0.07	0.03	0.01	0.19	0.08	0.04	0.10	0.03	0.01
Chromium	0.09	0.04	0.02	0.60	0.27	0.12	0.03	0.02	0.01
Copper	1.14	0.66	0.38	5.08	2.94	1.70	0.21	0.16	0.13
Lead	1.15	0.52	0.23	3.83	1.71	0.77	0.94	0.69	0.50
Mercury	1.02	0.59	0.34	0.72	0.41	0.24	0.81	0.36	0.16
Nickel	0.17	0.07	0.03	0.11	0.05	0.02	0.69	0.49	0.35
Selenium	0.08	0.04	0.02	1.17	0.83	0.59	0.24	0.19	0.15
Zinc	0.87	0.39	0.17	0.66	0.30	0.13	0.77	0.34	0.15
Polychlorinated Biphenyls									
Aroclor-1016	0.04	0.02	0.01	0.01	<0.01	<0.01	0.52	0.23	0.10
Aroclor-1221	0.04	0.02	0.01	0.01	<0.01	<0.01	0.48	0.21	0.10
Aroclor-1232	0.05	0.02	0.01	0.01	<0.01	<0.01	0.60	0.27	0.12
Aroclor-1242	0.04	0.02	0.01	0.01	<0.01	<0.01	0.44	0.20	0.09
Aroclor-1248	0.04	0.02	0.01	0.01	<0.01	<0.01	0.44	0.20	0.09
Aroclor-1254	0.25	0.11	0.05	0.05	0.02	0.01	2.95	1.32	0.59
Aroclor-1260	0.02	0.01	<0.01	<0.01	<0.01	<0.01	0.25	0.11	0.05
Pesticides									
4,4'-DDD	0.13	0.04	0.01	0.31	0.14	0.06	0.24	0.11	0.05
4,4'-DDE	0.34	0.11	0.03	0.53	0.24	0.11	0.68	0.30	0.14
Dieldrin	0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.05	0.03	0.02
Toxaphene	0.24	0.11	0.05	0.02	0.01	<0.01	0.03	0.02	0.01

Shaded cells indicate HQ > 1

TABLE F-28
Hazard Quotients for Aquatic Food Web Exposures - Step 3A (Baseline) - Mean - SWMU 6 Lagoon
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Green Heron			Spotted Sandpiper			Fishing Bat		
Chemical	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Metals									
Cadmium	0.05	0.02	0.01	0.14	0.06	0.03	0.06	0.02	0.01
Chromium	0.08	0.03	0.02	0.47	0.21	0.09	0.02	0.01	0.00
Copper	0.72	0.42	0.24	3.24	1.87	1.08	0.13	0.10	0.08
Lead	0.70	0.31	0.14	2.33	1.04	0.47	0.56	0.40	0.29
Mercury	0.69	0.40	0.23	0.49	0.28	0.16	0.55	0.25	0.11
Nickel	0.11	0.05	0.02	0.08	0.04	0.02	0.47	0.33	0.24
Selenium	0.06	0.03	0.01	0.94	0.66	0.47	0.20	0.15	0.12
Zinc	0.56	0.25	0.11	0.54	0.24	0.11	0.46	0.21	0.09
Polychlorinated Biphenyls									
Aroclor-1016	0.04	0.02	0.01	0.01	0.00	0.00	0.44	0.20	0.09
Aroclor-1221	0.03	0.02	0.01	0.01	0.00	0.00	0.40	0.18	0.08
Aroclor-1232	0.04	0.02	0.01	0.01	0.00	0.00	0.51	0.23	0.10
Aroclor-1242	0.03	0.01	0.01	0.00	0.00	0.00	0.37	0.17	0.07
Aroclor-1248	0.03	0.01	0.01	0.00	0.00	0.00	0.37	0.17	0.07
Aroclor-1254	0.13	0.06	0.03	0.02	0.01	0.00	1.59	0.71	0.32
Aroclor-1260	0.02	0.01	0.00	0.00	0.00	0.00	0.21	0.09	0.04
Pesticides									
4,4'-DDD	0.07	0.02	0.01	0.16	0.07	0.03	0.13	0.06	0.03
4,4'-DDE	0.18	0.06	0.02	0.28	0.13	0.06	0.36	0.16	0.07
Dieldrin	0.01	0.00	0.00	0.01	0.00	0.00	0.04	0.03	0.02
Toxaphene	0.19	0.09	0.04	0.01	0.01	0.00	0.03	0.01	0.01

Shaded cells indicate HQ > 1

TABLE F-29
Screening Statistics - Surface Water - Offsite Laguna Kiani Complex Lobe
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Volatile Organic Compounds (UG/L)																			
1,1,1-Trichloroethane	0.28 - 0.28	0 / 2	--	--	--	0.14	0.0	0.14	0.14	312	-- / --	0.001	NO	--	-- / --	--	--	--	NO
1,1,2,2-Tetrachloroethane	0.26 - 0.26	0 / 2	--	--	--	0.13	0.0	0.13	0.13	90.2	-- / --	0.003	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.46 - 0.46	0 / 2	--	--	--	0.23	0.0	0.23	0.23	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloroethane	0.40 - 0.40	0 / 2	--	--	--	0.20	0.0	0.20	0.20	550	-- / --	0.001	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethane	0.30 - 0.30	0 / 2	--	--	--	0.15	0.0	0.15	0.15	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethene	0.38 - 0.38	0 / 2	--	--	--	0.19	0.0	0.19	0.19	2,240	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
1,2,3-Trichlorobenzene	0.32 - 0.32	0 / 2	--	--	--	0.16	0.0	0.16	0.16	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2,4-Trichlorobenzene	0.22 - 0.22	0 / 2	--	--	--	0.11	0.0	0.11	0.11	5.40	-- / --	0.04	NO	--	-- / --	--	--	--	NO
1,2-Dibromo-3-chloropropane	2.00 - 2.00	0 / 2	--	--	--	1.00	0.0	1.00	1.00	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dibromoethane	0.22 - 0.22	0 / 2	--	--	--	0.11	0.0	0.11	0.11	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dichlorobenzene	0.50 - 0.50	0 / 2	--	--	--	0.25	0.0	0.25	0.25	42.0	-- / --	0.01	NO	--	-- / --	--	--	--	NO
1,2-Dichloroethane	0.30 - 0.30	0 / 2	--	--	--	0.15	0.0	0.15	0.15	1,130	-- / --	0.0003	NO	--	-- / --	--	--	--	NO
1,2-Dichloropropane	0.30 - 0.30	0 / 2	--	--	--	0.15	0.0	0.15	0.15	2,400	-- / --	0.0001	NO	--	-- / --	--	--	--	NO
1,3-Dichlorobenzene	0.30 - 0.30	0 / 2	--	--	--	0.15	0.0	0.15	0.15	28.5	-- / --	0.01	NO	--	-- / --	--	--	--	NO
1,4-Dichlorobenzene	0.30 - 0.30	0 / 2	--	--	--	0.15	0.0	0.15	0.15	19.9	-- / --	0.02	NO	--	-- / --	--	--	--	NO
2-Butanone	4.00 - 4.00	0 / 2	--	--	--	2.00	0.0	2.00	2.00	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2-Hexanone	0.96 - 0.96	0 / 2	--	--	--	0.48	0.0	0.48	0.48	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Methyl-2-pentanone	2.00 - 2.00	0 / 2	--	--	--	1.00	0.0	1.00	1.00	123,000	-- / --	0.00002	NO	--	-- / --	--	--	--	NO
Acetone	2.60 - 2.60	0 / 2	--	--	--	1.30	0.0	1.30	1.30	564,000	-- / --	0.000005	NO	--	-- / --	--	--	--	NO
Benzene	0.34 - 0.34	0 / 2	--	--	--	0.17	0.0	0.17	0.17	110	-- / --	0.003	NO	--	-- / --	--	--	--	NO
Bromochloromethane	0.34 - 0.34	0 / 2	--	--	--	0.17	0.0	0.17	0.17	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromodichloromethane	0.30 - 0.30	0 / 2	--	--	--	0.15	0.0	0.15	0.15	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromoform	0.38 - 0.38	0 / 2	--	--	--	0.19	0.0	0.19	0.19	640	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Bromomethane	0.86 - 0.86	0 / 2	--	--	--	0.43	0.0	0.43	0.43	120	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Carbon disulfide	0.38 - 0.38	0 / 2	--	--	--	0.19	0.0	0.19	0.19	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Carbon tetrachloride	0.28 - 0.28	0 / 2	--	--	--	0.14	0.0	0.14	0.14	1,500	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
Chlorobenzene	0.32 - 0.32	0 / 2	--	--	--	0.16	0.0	0.16	0.16	25.0	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Chloroethane	1.00 - 1.00	0 / 2	--	--	--	0.50	0.0	0.50	0.50	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chloroform	0.32 - 0.32	0 / 2	--	--	--	0.16	0.0	0.16	0.16	815	-- / --	0.0004	NO	--	-- / --	--	--	--	NO
Chloromethane	0.64 - 0.64	0 / 2	--	--	--	0.32	0.0	0.32	0.32	2,700	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
cis-1,2-Dichloroethene	0.38 - 0.38	0 / 2	--	--	--	0.19	0.0	0.19	0.19	680	-- / --	0.001	NO	--	-- / --	--	--	--	NO
cis-1,3-Dichloropropene	0.24 - 0.24	0 / 2	--	--	--	0.12	0.0	0.12	0.12	7.90	-- / --	0.03	NO	--	-- / --	--	--	--	NO
Cyclohexane	0.40 - 0.40	0 / 2	--	--	--	0.20	0.0	0.20	0.20	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dibromochloromethane	0.26 - 0.26	0 / 2	--	--	--	0.13	0.0	0.13	0.13	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dichlorodifluoromethane (Freon-12)	0.34 - 0.34	0 / 2	--	--	--	0.17	0.0	0.17	0.17	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Ethylbenzene	0.44 - 0.44	0 / 2	--	--	--	0.22	0.0	0.22	0.22	25.0	-- / --	0.02	NO	--	-- / --	--	--	--	NO
Isopropylbenzene	0.28 - 0.28	0 / 2	--	--	--	0.14	0.0	0.14	0.14	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methyl acetate	0.76 - 0.76	0 / 2	--	--	--	0.38	0.0	0.38	0.38	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylcyclohexane	0.54 - 0.54	0 / 2	--	--	--	0.27	0.0	0.27	0.27	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylene chloride	1.30 - 1.30	0 / 2	--	--	--	0.65	0.0	0.65	0.65	2,560	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Methyl-tert-butyl ether (MTBE)	1.00 - 1.00	0 / 2	--	--	--	0.50	0.0	0.50	0.50	5,000	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
Styrene	0.24 - 0.24	0 / 2	--	--	--	0.12	0.0	0.12	0.12	910	-- / --	0.0003	NO	--	-- / --	--	--	--	NO
Tetrachloroethene	0.42 - 0.42	0 / 2	--	--	--	0.21	0.0	0.21	0.21	45.0	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Toluene	0.28 - 0.28	0 / 2	--	--	--	0.14	0.0	0.14	0.14	215	-- / --	0.001	NO	--	-- / --	--	--	--	NO
trans-1,2-Dichloroethene	0.50 - 0.50	0 / 2	--	--	--	0.25	0.0	0.25	0.25	680	-- / --	0.001	NO	--	-- / --	--	--	--	NO
trans-1,3-Dichloropropene	0.60 - 0.60	0 / 2	--	--	--	0.30	0.0	0.30	0.30	7.90	-- / --	0.08	NO	--	-- / --	--	--	--	NO
Trichloroethene	0.38 - 0.38	0 / 2	--	--	--	0.19	0.0	0.19	0.19	1,940	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
Trichlorofluoromethane (Freon-11)	0.24 - 0.24	0 / 2	--	--	--	0.12	0.0	0.12	0.12	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Vinyl chloride	0.36 - 0.36	0 / 2	--	--	--	0.18	0.0	0.18	0.18	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Xylene, total	1.00 - 1.00	0 / 2	--	--	--	0.50	0.0	0.50	0.50	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO

TABLE F-29
Screening Statistics - Surface Water - Offsite Laguna Kiani Complex Lobe
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Semivolatile Organic Compounds (UG/L)																			
1-Methylnaphthalene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2-Methylnaphthalene	0.042 - 0.042	1 / 2	0.023	0.023	VWW06-SW002-0211	0.022	0.0014	0.028	0.022	330	0 / 2	0.0001	NO	--	-- / --	--	--	--	NO
Acenaphthene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	40.0	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Acenaphthylene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Anthracene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	0.18	-- / --	0.23	NO	--	-- / --	--	--	--	NO
Benzo(a)anthracene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Benzo(a)pyrene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Benzo(b)fluoranthene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Benzo(g,h,i)perylene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Benzo(k)fluoranthene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chrysene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dibenz(a,h)anthracene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Fluoranthene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	11.0	-- / --	0.004	NO	--	-- / --	--	--	--	NO
Fluorene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Indeno(1,2,3-cd)pyrene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Naphthalene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	1.40	-- / --	0.03	NO	--	-- / --	--	--	--	NO
Phenanthrene	0.042 - 0.042	1 / 2	0.023	0.023	VWW06-SW002-0211	0.022	0.0014	0.028	0.022	8.30	0 / 2	0.003	NO	--	-- / --	--	--	--	NO
Pyrene	0.042 - 0.042	0 / 2	--	--	--	0.021	0.0	0.021	0.021	0.24	-- / --	0.18	NO	--	-- / --	--	--	--	NO
Pesticide/Polychlorinated Biphenyls (UG/L)																			
4,4'-DDD	0.0053 - 0.0054	0 / 2	--	--	--	0.0027	0.00004	0.0028	0.0027	0.0010	-- / --	5.40	YES	0.048	-- / --	0.11	--	--	NO
4,4'-DDE	0.0078 - 0.0079	0 / 2	--	--	--	0.0039	0.00004	0.0041	0.0039	0.0010	-- / --	7.90	YES	0.067	-- / --	0.12	--	--	NO
4,4'-DDT	0.0022 - 0.0023	0 / 2	--	--	--	0.0011	0.00004	0.0013	0.0011	0.0010	-- / --	2.30	YES	0.083	-- / --	0.03	--	--	NO
Aldrin	0.0033 - 0.0033	0 / 2	--	--	--	0.0017	0.0	0.0017	0.0017	0.13	-- / --	0.03	NO	--	-- / --	--	--	--	NO
alpha-BHC	0.0062 - 0.0062	0 / 2	--	--	--	0.0031	0.0	0.0031	0.0031	25.0	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
alpha-Chlordane	0.0062 - 0.0062	0 / 2	--	--	--	0.0031	0.0	0.0031	0.0031	0.0040	-- / --	1.55	YES	0.045	-- / --	0.14	--	--	NO
Aroclor-1016	0.020 - 0.021	0 / 2	--	--	--	0.010	0.0004	0.012	0.010	0.030	-- / --	0.70	NO	--	-- / --	--	--	--	NO
Aroclor-1221	0.020 - 0.021	0 / 2	--	--	--	0.010	0.0004	0.012	0.010	0.030	-- / --	0.70	NO	--	-- / --	--	--	--	NO
Aroclor-1232	0.016 - 0.016	0 / 2	--	--	--	0.0080	0.0	0.0080	0.0080	0.030	-- / --	0.53	NO	--	-- / --	--	--	--	NO
Aroclor-1242	0.020 - 0.021	0 / 2	--	--	--	0.010	0.0004	0.012	0.010	0.030	-- / --	0.70	NO	--	-- / --	--	--	--	NO
Aroclor-1248	0.011 - 0.011	0 / 2	--	--	--	0.0055	0.0	0.0055	0.0055	0.030	-- / --	0.37	NO	--	-- / --	--	--	--	NO
Aroclor-1254	0.0098 - 0.0099	0 / 2	--	--	--	0.0049	0.00004	0.0051	0.0049	0.030	-- / --	0.33	NO	--	-- / --	--	--	--	NO
Aroclor-1260	0.020 - 0.021	0 / 2	--	--	--	0.010	0.0004	0.012	0.010	0.030	-- / --	0.70	NO	--	-- / --	--	--	--	NO
beta-BHC	0.0025 - 0.0025	0 / 2	--	--	--	0.0013	0.0	0.0013	0.0013	25.0	-- / --	0.0001	NO	--	-- / --	--	--	--	NO
delta-BHC	0.0062 - 0.0062	0 / 2	--	--	--	0.0031	0.0	0.0031	0.0031	25.0	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
Dieldrin	0.0055 - 0.0056	0 / 2	--	--	--	0.0028	0.00004	0.0029	0.0028	0.11	-- / --	0.05	NO	--	-- / --	--	--	--	NO
Endosulfan I	0.0088 - 0.0089	0 / 2	--	--	--	0.0044	0.00004	0.0046	0.0044	0.0087	-- / --	1.02	YES	0.049	-- / --	0.18	--	--	NO
Endosulfan II	0.0033 - 0.0033	0 / 2	--	--	--	0.0017	0.0	0.0017	0.0017	0.0087	-- / --	0.38	NO	--	-- / --	--	--	--	NO
Endosulfan sulfate	0.0020 - 0.0021	0 / 2	--	--	--	0.0010	0.00004	0.0012	0.0010	0.0087	-- / --	0.24	NO	--	-- / --	--	--	--	NO
Endrin	0.0037 - 0.0037	0 / 2	--	--	--	0.0019	0.0	0.0019	0.0019	0.010	-- / --	0.37	NO	--	-- / --	--	--	--	NO
Endrin aldehyde	0.0031 - 0.0031	0 / 2	--	--	--	0.0016	0.0	0.0016	0.0016	0.010	-- / --	0.31	NO	--	-- / --	--	--	--	NO
Endrin ketone	0.012 - 0.012	0 / 2	--	--	--	0.0060	0.0	0.0060	0.0060	0.010	-- / --	1.20	YES	0.029	-- / --	0.41	--	--	NO
gamma-BHC (Lindane)	0.0049 - 0.0050	0 / 2	--	--	--	0.0025	0.00004	0.0026	0.0025	0.16	-- / --	0.03	NO	--	-- / --	--	--	--	NO
gamma-Chlordane	0.0049 - 0.0050	0 / 2	--	--	--	0.0025	0.00004	0.0026	0.0025	0.0040	-- / --	1.25	YES	0.026	-- / --	0.19	--	--	NO
Heptachlor	0.0081 - 0.0082	0 / 2	--	--	--	0.0041	0.00004	0.0042	0.0041	0.0036	-- / --	2.28	YES	0.0074	-- / --	1.11	1.18	1.13	NO[4]
Heptachlor epoxide	0.0029 - 0.0029	0 / 2	--	--	--	0.0015	0.0	0.0015	0.0015	0.0036	-- / --	0.81	NO	--	-- / --	--	--	--	NO
Methoxychlor	0.0037 - 0.0037	0 / 2	--	--	--	0.0019	0.0	0.0019	0.0019	0.030	-- / --	0.12	NO	--	-- / --	--	--	--	NO
Toxaphene	0.37 - 0.37	0 / 2	--	--	--	0.19	0.0	0.19	0.19	0.21	-- / --	1.76	YES	--	-- / --	--	0.88	0.88	NO

TABLE F-29
Screening Statistics - Surface Water - Offsite Laguna Kiani Complex Lobe
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Inorganics (UG/L)																			
Aluminum	-- - --	2 / 2	316	446	VWW06-SW002-0211	381	91.9	791	375	87.0	2 / 2	5.13	YES	428	1 / 2	1.04	9.10	4.38	NO
Antimony	20.0 - 66.0	0 / 2	--	--	--	21.5	16.3	94.1	18.2	500	-- / --	0.13	NO	--	-- / --	--	--	--	NO
Arsenic	66.2 - 66.2	0 / 2	--	--	--	33.1	0.0	33.1	33.1	36.0	-- / --	1.84	YES	--	-- / --	--	0.92	0.92	NO
Barium	-- - --	2 / 2	8.09	9.36	VWW06-SW002-0211	8.73	0.90	12.7	8.70	200	0 / 2	0.05	NO	--	-- / --	--	--	--	NO
Beryllium	2.40 - 2.40	0 / 2	--	--	--	1.20	0.0	1.20	1.20	100	-- / --	0.02	NO	--	-- / --	--	--	--	NO
Cadmium	-- - --	2 / 2	9.86	11.0	VWW06-SW002-0211	10.4	0.81	14.0	10.4	8.85	2 / 2	1.24	YES	12.5	0 / 2	0.88	--	--	NO
Calcium [3]	-- - --	2 / 2	392,000	393,000	VWW06-SW001-0211	392,500	707	395,657	392,500	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chromium	8.60 - 8.60	0 / 2	--	--	--	4.30	0.0	4.30	4.30	50.4	-- / --	0.17	NO	--	-- / --	--	--	--	NO
Cobalt	7.40 - 7.40	0 / 2	--	--	--	3.70	0.0	3.70	3.70	23.0	-- / --	0.32	NO	--	-- / --	--	--	--	NO
Copper	-- - --	2 / 2	98.9	104	VWW06-SW001-0211	101	3.61	118	101	3.73	2 / 2	27.9	YES	152	0 / 2	0.68	--	--	NO
Iron	110 - 110	1 / 2	118	118	VWW06-SW002-0211	86.5	44.5	285	80.6	50.0	1 / 2	2.36	YES	5,270	0 / 2	0.02	--	--	NO
Lead	20.0 - 20.0	1 / 2	39.4	39.4	VWW06-SW002-0211	24.7	20.8	118	19.8	8.52	1 / 2	4.62	YES	--	-- / --	--	13.8	2.90	NO
Magnesium [3]	-- - --	2 / 2	1,200,000	1,220,000	VWW06-SW002-0211	1,210,000	14,142	1,273,138	1,209,959	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Manganese	7.00 - 7.00	0 / 2	--	--	--	3.50	0.0	3.50	3.50	100	-- / --	0.07	NO	--	-- / --	--	--	--	NO
Mercury	0.074 - 0.074	1 / 2	0.040	0.040	VWW06-SW001-0211	0.039	0.0022	0.048	0.039	1.11	0 / 2	0.04	NO	--	-- / --	--	--	--	NO
Nickel	18.6 - 18.6	0 / 2	--	--	--	9.30	0.0	9.30	9.30	8.28	-- / --	2.25	YES	--	-- / --	--	1.12	1.12	NO[4]
Potassium [3]	-- - --	2 / 2	415,000	417,000	VWW06-SW001-0211	416,000	1,414	422,314	415,999	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Selenium	-- - --	2 / 2	70.1	74.2	VWW06-SW002-0211	72.2	2.90	85.1	72.1	71.1	1 / 2	1.04	YES	126	0 / 2	0.59	--	--	NO
Silver	10.4 - 10.4	0 / 2	--	--	--	5.20	0.0	5.20	5.20	2.24	-- / --	4.64	YES	--	-- / --	--	2.32	2.32	NO[4]
Sodium [3]	-- - --	2 / 2	10,500,000	10,500,000	VWW06-SW001-0211	10,500,000	0.0	10,500,000	10,500,000	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Thallium	88.0 - 88.0	0 / 2	--	--	--	44.0	0.0	44.0	44.0	21.3	-- / --	4.13	YES	--	-- / --	--	2.07	2.07	NO[4]
Vanadium	8.80 - 8.80	1 / 2	5.30	5.30	VWW06-SW001-0211	4.85	0.64	7.69	4.83	50.0	0 / 2	0.11	NO	--	-- / --	--	--	--	NO
Zinc	80.0 - 80.0	0 / 2	--	--	--	40.0	0.0	40.0	40.0	85.6	-- / --	0.93	NO	--	-- / --	--	--	--	NO
Dissolved Metals (UG/L)																			
Aluminum	186 - 186	0 / 1	--	--	--	93.0	--	--	93.0	87.0	-- / --	2.14	YES	242	-- / --	0.77	--	--	NO
Antimony	66.0 - 66.0	0 / 2	--	--	--	33.0	0.0	33.0	33.0	500	-- / --	0.13	NO	--	-- / --	--	--	--	NO
Arsenic	66.2 - 66.2	0 / 2	--	--	--	33.1	0.0	33.1	33.1	36.0	-- / --	1.84	YES	--	-- / --	--	0.92	0.92	NO
Barium	-- - --	2 / 2	6.83	7.36	VWW06-SW002-0211	7.10	0.37	8.77	7.09	200	0 / 2	0.04	NO	--	-- / --	--	--	--	NO
Beryllium	2.40 - 2.40	0 / 2	--	--	--	1.20	0.0	1.20	1.20	100	-- / --	0.02	NO	--	-- / --	--	--	--	NO
Cadmium	14.4 - 14.4	0 / 2	--	--	--	7.20	0.0	7.20	7.20	8.80	-- / --	1.64	YES	--	-- / --	--	0.82	0.82	NO
Calcium [3]	-- - --	2 / 2	400,000	400,000	VWW06-SW001-0211	400,000	0.0	400,000	400,000	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chromium	8.60 - 8.60	0 / 2	--	--	--	4.30	0.0	4.30	4.30	50.0	-- / --	0.17	NO	--	-- / --	--	--	--	NO
Cobalt	7.40 - 7.40	0 / 2	--	--	--	3.70	0.0	3.70	3.70	23.0	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Copper	54.0 - 54.0	0 / 2	--	--	--	27.0	0.0	27.0	27.0	3.10	-- / --	17.4	YES	26.0	-- / --	2.08	8.71	8.71	NO[4]
Iron	110 - 110	1 / 2	318	318	VWW06-SW001-0211	187	186	1,017	132	50.0	1 / 2	6.36	YES	--	-- / --	--	20.3	3.73	YES
Lead	20.0 - 20.0	0 / 2	--	--	--	10.0	0.0	10.0	10.0	8.10	-- / --	2.47	YES	11.9	-- / --	1.68	1.23	1.23	NO[4]
Magnesium [3]	-- - --	2 / 2	1,260,000	1,270,000	VWW06-SW001-0211	1,265,000	7,071	1,296,569	1,264,990	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Manganese	7.00 - 7.00	0 / 2	--	--	--	3.50	0.0	3.50	3.50	100	-- / --	0.07	NO	--	-- / --	--	--	--	NO
Mercury	-- - --	2 / 2	0.043	0.048	VWW06-SW002-0211	0.045	0.0029	0.058	0.045	0.94	0 / 2	0.05	NO	--	-- / --	--	--	--	NO
Nickel	18.6 - 18.6	0 / 2	--	--	--	9.30	0.0	9.30	9.30	8.20	-- / --	2.27	YES	--	-- / --	--	1.13	1.13	NO[4]
Potassium [3]	-- - --	2 / 2	408,000	409,000	VWW06-SW002-0211	408,500	707	411,657	408,500	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Selenium	82.0 - 82.0	1 / 2	50.5	50.5	VWW06-SW002-0211	45.8	6.72	75.7	45.5	71.0	0 / 2	0.71	NO	--	-- / --	--	--	--	NO
Silver	10.4 - 10.4	0 / 2	--	--	--	5.20	0.0	5.20	5.20	2.24	-- / --	4.64	YES	--	-- / --	--	2.32	2.32	NO[4]
Sodium [3]	-- - --	2 / 2	10,300,000	10,400,000	VWW06-SW001-0211	10,350,000	70,711	10,665,688	10,349,879	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Thallium	88.0 - 88.0	0 / 2	--	--	--	44.0	0.0	44.0	44.0	21.3	-- / --	4.13	YES	--	-- / --	--	2.07	2.07	NO[4]
Vanadium	8.80 - 8.80	1 / 2	4.67	4.67	VWW06-SW001-0211	4.54	0.19	5.39	4.53	50.0	0 / 2	0.09	NO	--	-- / --	--	--	--	NO
Zinc	80.0 - 80.0	0 / 2	--	--	--	40.0	0.0	40.0	40.0	81.0	-- / --	0.99	NO	--	-- / --	--	--	--	NO
Other Parameters (MG/L)																			
Chromium (hexavalent)	0.0070 - 0.0070	0 / 2	--	--	--	0.0035	0.0	0.0035	0.0035	0.0504	-- / --	0.14	NO	--	-- / --	--	--	--	NO
Dissolved Other Parameters (MG/L)																			
Chromium (hexavalent)	0.0070 - 0.0070	0 / 2	--	--	--	0.0035	0.0	0.0035	0.0035	0.0500	-- / --	0.14	NO	--	-- / --	--	--	--	NO

NSV - No Screening Value
1 - Count of detected samples exceeding or equaling Screening Value
2 - Shaded cells indicate hazard quotient based on reporting limits
3 - Macronutrient - Not considered to be a COPC
4 - See Section 1.6 (uncertainties)
Yellow shading indicates freshwater screening value used for detected chemicals lacking marine surface water screening values

TABLE F-30
Screening Statistics - 2011 Sediment Samples - Offsite Laguna Kiani Complex Lobe
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Volatile Organic Compounds (UG/KG)																			
1,1,1-Trichloroethane	2.40 - 2.40	0 / 2	--	--	--	1.20	0.0	1.20	1.20	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2,2-Tetrachloroethane	4.40 - 4.40	0 / 2	--	--	--	2.20	0.0	2.20	2.20	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	4.80 - 4.80	0 / 2	--	--	--	2.40	0.0	2.40	2.40	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloroethane	6.20 - 6.20	0 / 2	--	--	--	3.10	0.0	3.10	3.10	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethane	2.60 - 2.60	0 / 2	--	--	--	1.30	0.0	1.30	1.30	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethene	2.60 - 2.60	0 / 2	--	--	--	1.30	0.0	1.30	1.30	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2,3-Trichlorobenzene	4.60 - 4.60	0 / 2	--	--	--	2.30	0.0	2.30	2.30	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2,4-Trichlorobenzene	4.80 - 4.80	0 / 2	--	--	--	2.40	0.0	2.40	2.40	4.80	-- / --	1.00	YES	--	-- / --	--	0.50	0.50	NO
1,2-Dibromo-3-chloropropane	18.9 - 18.9	0 / 2	--	--	--	9.45	0.0	9.45	9.45	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dibromoethane	6.20 - 6.20	0 / 2	--	--	--	3.10	0.0	3.10	3.10	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dichlorobenzene	4.20 - 4.20	0 / 2	--	--	--	2.10	0.0	2.10	2.10	13.0	-- / --	0.32	NO	--	-- / --	--	--	--	NO
1,2-Dichloroethane	7.50 - 7.60	0 / 2	--	--	--	3.78	0.035	3.93	3.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dichloropropane	4.80 - 4.80	0 / 2	--	--	--	2.40	0.0	2.40	2.40	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,3-Dichlorobenzene	3.40 - 3.40	0 / 2	--	--	--	1.70	0.0	1.70	1.70	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,4-Dichlorobenzene	4.90 - 4.90	0 / 2	--	--	--	2.45	0.0	2.45	2.45	110	-- / --	0.04	NO	--	-- / --	--	--	--	NO
2-Butanone	-- - --	2 / 2	28.5	30.5	VWW06-SD001-0211	29.5	1.41	35.8	29.5	NSV	-- / --	NSV	YES	--	-- / --	--	NSV	NSV	YES
2-Hexanone	9.80 - 9.80	0 / 2	--	--	--	4.90	0.0	4.90	4.90	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Methyl-2-pentanone	12.1 - 12.1	0 / 2	--	--	--	6.05	0.0	6.05	6.05	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Acetone	-- - --	2 / 2	104	207	VWW06-SD001-0211	156	72.8	481	147	NSV	-- / --	NSV	YES	--	-- / --	--	NSV	NSV	YES
Benzene	3.80 - 3.80	0 / 2	--	--	--	1.90	0.0	1.90	1.90	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromochloromethane	6.80 - 6.80	0 / 2	--	--	--	3.40	0.0	3.40	3.40	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromodichloromethane	2.40 - 2.40	0 / 2	--	--	--	1.20	0.0	1.20	1.20	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromoform	3.50 - 3.50	0 / 2	--	--	--	1.75	0.0	1.75	1.75	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromomethane	7.50 - 7.60	0 / 2	--	--	--	3.78	0.035	3.93	3.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Carbon disulfide	-- - --	2 / 2	9.50	17.0	VWW06-SD001-0211	13.3	5.30	36.9	12.7	NSV	-- / --	NSV	YES	--	-- / --	--	NSV	NSV	YES
Carbon tetrachloride	4.50 - 4.50	0 / 2	--	--	--	2.25	0.0	2.25	2.25	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chlorobenzene	2.60 - 2.60	0 / 2	--	--	--	1.30	0.0	1.30	1.30	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chloroethane	5.60 - 5.60	0 / 2	--	--	--	2.80	0.0	2.80	2.80	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chloroform	4.10 - 4.10	0 / 2	--	--	--	2.05	0.0	2.05	2.05	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chloromethane	2.90 - 2.90	0 / 2	--	--	--	1.45	0.0	1.45	1.45	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
cis-1,2-Dichloroethene	4.70 - 4.70	0 / 2	--	--	--	2.35	0.0	2.35	2.35	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
cis-1,3-Dichloropropene	3.20 - 3.20	0 / 2	--	--	--	1.60	0.0	1.60	1.60	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Cyclohexane	7.50 - 7.60	0 / 2	--	--	--	3.78	0.035	3.93	3.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dibromochloromethane	3.50 - 3.50	0 / 2	--	--	--	1.75	0.0	1.75	1.75	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dichlorodifluoromethane (Freon-12)	4.50 - 4.50	0 / 2	--	--	--	2.25	0.0	2.25	2.25	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Ethylbenzene	5.20 - 5.20	0 / 2	--	--	--	2.60	0.0	2.60	2.60	4.00	-- / --	1.30	YES	--	-- / --	--	0.65	0.65	NO
Isopropylbenzene	4.50 - 4.50	0 / 2	--	--	--	2.25	0.0	2.25	2.25	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methyl acetate	15.1 - 15.1	0 / 2	--	--	--	7.55	0.0	7.55	7.55	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylcyclohexane	3.20 - 3.20	0 / 2	--	--	--	1.60	0.0	1.60	1.60	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylene chloride	9.00 - 9.10	0 / 2	--	--	--	4.53	0.035	4.68	4.52	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methyl-tert-butyl ether (MTBE)	3.20 - 3.20	0 / 2	--	--	--	1.60	0.0	1.60	1.60	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Styrene	2.10 - 2.10	0 / 2	--	--	--	1.05	0.0	1.05	1.05	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Tetrachloroethene	-- - --	2 / 2	10.3	12.0	VWW06-SD001-0211	11.2	1.20	16.5	11.1	57.0	0 / 2	0.21	NO	--	-- / --	--	--	--	NO
Toluene	2.20 - 2.20	0 / 2	--	--	--	1.10	0.0	1.10	1.10	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
trans-1,2-Dichloroethene	2.90 - 2.90	0 / 2	--	--	--	1.45	0.0	1.45	1.45	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
trans-1,3-Dichloropropene	7.50 - 7.60	0 / 2	--	--	--	3.78	0.035	3.93	3.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Trichloroethene	3.30 - 3.30	0 / 2	--	--	--	1.65	0.0	1.65	1.65	41.0	-- / --	0.08	NO	--	-- / --	--	--	--	NO
Trichlorofluoromethane (Freon-11)	3.30 - 3.30	0 / 2	--	--	--	1.65	0.0	1.65	1.65	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Vinyl chloride	4.50 - 4.50	0 / 2	--	--	--	2.25	0.0	2.25	2.25	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Xylene, total	5.10 - 5.10	0 / 2	--	--	--	2.55	0.0	2.55	2.55	4.00	-- / --	1.28	YES	--	-- / --	--	0.64	0.64	NO
Semivolatile Organic Compounds (UG/KG)																			
1-Methylnaphthalene	9.00 - 66.8	0 / 2	--	--	--	19.0	20.4	110	12.3	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2-Methylnaphthalene	9.00 - 66.8	0 / 2	--	--	--	19.0	20.4	110	12.3	70.0	-- / --	0.95	NO	--	-- / --	--	--	--	NO
Acenaphthene	9.00 - 66.8	0 / 2	--	--	--	19.0	20.4	110	12.3	16.0	-- / --	4.18	YES	--	-- / --	--	6.89	1.18	(YES)
Acenaphthylene	9.00 - 66.8	0 / 2	--	--	--	19.0	20.4	110	12.3	44.0	-- / --	1.52	YES	--	-- / --	--	2.50	0.43	NO
Anthracene	66.8 - 66.8	1 / 2	9.90	9.90	VWW06-SD001-0211	21.7	16.6	95.8	18.2	85.3	0 / 2	0.12	NO	--	-- / --	--	--	--	NO
Benzo(a)anthracene	70.3 - 70.3	1 / 2	10.1	10.1	VWW06-SD001-0211	22.6	17.7	102	18.8	261	0 / 2	0.04	NO	--	-- / --	--	--	--	NO
Benzo(a)pyrene	11.2 - 83.6	0 / 2	--	--	--	23.7	25.6	138	15.3	430	-- / --	0.19	NO	--	-- / --	--	--	--	NO
Benzo(b)fluoranthene	11.2 - 83.6	0 / 2	--	--	--	23.7	25.6	138	15.3	1,800	-- / --	0.05	NO	--	-- / --	--	--	--	NO
Benzo(g,h,i)perylene	11.2 - 83.6	0 / 2	--	--	--	23.7	25.6	138	15.3	670	-- / --	0.12	NO	--	-- / --	--	--	--	NO

TABLE F-30
Screening Statistics - 2011 Sediment Samples - Offsite Laguna Kiani Complex Lobe
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Benzo(k)fluoranthene	11.2 - 83.6	0 / 2	--	--	--	23.7	25.6	138	15.3	1,800	-- / --	0.05	NO	--	-- / --	--	--	--	NO
Chrysene	65.3 - 65.3	1 / 2	6.20	6.20	VWW06-SD001-0211	19.4	18.7	103	14.2	384	0 / 2	0.02	NO	--	-- / --	--	--	--	NO
Dibenz(a,h)anthracene	11.2 - 83.6	0 / 2	--	--	--	23.7	25.6	138	15.3	63.4	-- / --	1.32	YES	--	-- / --	--	2.18	0.37	NO
Fluoranthene	66.8 - 66.8	1 / 2	14.8	14.8	VWW06-SD001-0211	24.1	13.2	82.8	22.2	600	0 / 2	0.02	NO	--	-- / --	--	--	--	NO
Fluorene	9.00 - 66.8	0 / 2	--	--	--	19.0	20.4	110	12.3	19.0	-- / --	3.52	YES	--	-- / --	--	5.80	1.00	(YES)
Indeno(1,2,3-cd)pyrene	11.2 - 83.6	0 / 2	--	--	--	23.7	25.6	138	15.3	600	-- / --	0.14	NO	--	-- / --	--	--	--	NO
Naphthalene	9.00 - 66.8	0 / 2	--	--	--	19.0	20.4	110	12.3	160	-- / --	0.42	NO	--	-- / --	--	--	--	NO
PAH (HMW)	352 - 352	1 / 2	59.9	59.9	VWW06-SD001-0211	118	82.1	484	103	1,700	0 / 2	0.04	NO	--	-- / --	--	--	--	NO
PAH (LMW)	267 - 267	1 / 2	51.8	51.8	VWW06-SD001-0211	92.7	57.8	351	83.2	552	0 / 2	0.09	NO	--	-- / --	--	--	--	NO
PAH (total)	619 - 619	1 / 2	112	112	VWW06-SD001-0211	211	140	835	186	4,022	0 / 2	0.03	NO	--	-- / --	--	--	--	NO
Phenanthrene	66.8 - 66.8	1 / 2	4.60	4.60	VWW06-SD001-0211	19.0	20.4	110	12.4	240	0 / 2	0.02	NO	--	-- / --	--	--	--	NO
Pyrene	66.8 - 66.8	1 / 2	10.0	10.0	VWW06-SD001-0211	21.7	16.5	95.6	18.3	665	0 / 2	0.02	NO	--	-- / --	--	--	--	NO
Pesticide/Polychlorinated Biphenyls (UG/KG)																			
4,4'-DDD	2.60 - 2.60	1 / 2	1.50	1.50	VWW06-SD002-0211	1.40	0.14	2.03	1.40	1.22	1 / 2	1.23	YES	--	-- / --	--	1.67	1.15	YES
4,4'-DDE	1.40 - 1.40	1 / 2	1.10	1.10	VWW06-SD002-0211	0.90	0.28	2.16	0.88	2.20	0 / 2	0.50	NO	--	-- / --	--	--	--	NO
4,4'-DDT	1.50 - 2.00	0 / 2	--	--	--	0.88	0.18	1.66	0.87	1.19	-- / --	1.68	YES	--	-- / --	--	1.40	0.74	NO
Aldrin	0.58 - 0.77	0 / 2	--	--	--	0.34	0.067	0.64	0.33	9.50	-- / --	0.08	NO	--	-- / --	--	--	--	NO
alpha-BHC	2.90 - 3.80	0 / 2	--	--	--	1.68	0.32	3.10	1.66	0.32	-- / --	11.9	YES	--	-- / --	--	9.67	5.23	(YES)
alpha-Chlordane	0.62 - 0.82	0 / 2	--	--	--	0.36	0.071	0.68	0.36	2.26	-- / --	0.36	NO	--	-- / --	--	--	--	NO
Aroclor-1016	50.0 - 67.0	0 / 2	--	--	--	29.3	6.01	56.1	28.9	48.0	-- / --	1.40	YES	--	-- / --	--	1.17	0.61	NO
Aroclor-1221	46.0 - 62.0	0 / 2	--	--	--	27.0	5.66	52.3	26.7	48.0	-- / --	1.29	YES	--	-- / --	--	1.09	0.56	NO
Aroclor-1232	58.0 - 77.0	0 / 2	--	--	--	33.8	6.72	63.7	33.4	48.0	-- / --	1.60	YES	--	-- / --	--	1.33	0.70	NO
Aroclor-1242	42.0 - 56.0	0 / 2	--	--	--	24.5	4.95	46.6	24.2	48.0	-- / --	1.17	YES	--	-- / --	--	0.97	0.51	NO
Aroclor-1248	42.0 - 56.0	0 / 2	--	--	--	24.5	4.95	46.6	24.2	48.0	-- / --	1.17	YES	--	-- / --	--	0.97	0.51	NO
Aroclor-1254	37.0 - 49.0	0 / 2	--	--	--	21.5	4.24	40.4	21.3	63.3	-- / --	0.77	NO	--	-- / --	--	--	--	NO
Aroclor-1260	24.0 - 31.0	0 / 2	--	--	--	13.8	2.47	24.8	13.6	48.0	-- / --	0.65	NO	--	-- / --	--	--	--	NO
beta-BHC	0.58 - 0.77	0 / 2	--	--	--	0.34	0.067	0.64	0.33	0.32	-- / --	2.41	YES	--	-- / --	--	1.99	1.05	(YES)
delta-BHC	1.10 - 1.40	0 / 2	--	--	--	0.63	0.11	1.10	0.62	0.32	-- / --	4.38	YES	--	-- / --	--	3.43	1.95	(YES)
Dieldrin	0.62 - 0.82	0 / 2	--	--	--	0.36	0.071	0.68	0.36	0.72	-- / --	1.15	YES	--	-- / --	--	0.95	0.50	NO
Endosulfan I	0.85 - 1.10	0 / 2	--	--	--	0.49	0.088	0.88	0.48	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Endosulfan II	1.10 - 1.50	0 / 2	--	--	--	0.65	0.14	1.28	0.64	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Endosulfan sulfate	0.77 - 1.00	0 / 2	--	--	--	0.44	0.081	0.81	0.44	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Endrin	1.00 - 1.30	0 / 2	--	--	--	0.58	0.11	1.05	0.57	0.020	-- / --	65.0	YES	--	-- / --	--	52.4	28.8	(YES)
Endrin aldehyde	1.40 - 1.80	0 / 2	--	--	--	0.80	0.14	1.43	0.79	0.020	-- / --	90.0	YES	--	-- / --	--	71.6	40.0	(YES)
Endrin ketone	0.81 - 1.10	0 / 2	--	--	--	0.48	0.10	0.94	0.47	0.020	-- / --	55.0	YES	--	-- / --	--	46.8	23.9	(YES)
gamma-BHC (Lindane)	0.77 - 1.00	0 / 2	--	--	--	0.44	0.081	0.81	0.44	0.32	-- / --	3.13	YES	--	-- / --	--	2.52	1.38	(YES)
gamma-Chlordane	0.66 - 0.87	0 / 2	--	--	--	0.38	0.074	0.71	0.38	2.26	-- / --	0.38	NO	--	-- / --	--	--	--	NO
Heptachlor	0.77 - 1.00	0 / 2	--	--	--	0.44	0.081	0.81	0.44	0.30	-- / --	3.33	YES	--	-- / --	--	2.69	1.48	(YES)
Heptachlor epoxide	0.58 - 0.77	0 / 2	--	--	--	0.34	0.067	0.64	0.33	0.30	-- / --	2.57	YES	--	-- / --	--	2.12	1.13	(YES)
Methoxychlor	1.00 - 1.40	0 / 2	--	--	--	0.60	0.14	1.23	0.59	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Toxaphene	96.0 - 130	0 / 2	--	--	--	56.5	12.0	110	55.9	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Inorganics (MG/KG)																			
Aluminum	-- - --	2 / 2	12,600	14,500	VWW06-SD001-0211	13,550	1,344	19,548	13,517	18,000	0 / 2	0.81	NO	--	-- / --	--	--	--	NO
Antimony	0.92 - 1.10	0 / 2	--	--	--	0.51	0.062	0.78	0.50	2.00	-- / --	0.55	NO	--	-- / --	--	--	--	NO
Arsenic	-- - --	2 / 2	4.00	5.80	VWW06-SD002-0211	4.90	1.27	10.6	4.82	8.20	0 / 2	0.71	NO	--	-- / --	--	--	--	NO
Barium	-- - --	2 / 2	10.7	12.2	VWW06-SD001-0211	11.5	1.06	16.2	11.4	48.0	0 / 2	0.25	NO	--	-- / --	--	--	--	NO
Beryllium	0.73 - 0.73	1 / 2	0.34	0.34	VWW06-SD002-0211	0.35	0.021	0.44	0.35	NSV	-- / --	NSV	YES	0.72	0 / 2	0.47	--	--	NO
Cadmium	0.19 - 0.19	1 / 2	0.30	0.30	VWW06-SD001-0211	0.20	0.15	0.85	0.17	1.20	0 / 2	0.25	NO	--	-- / --	--	--	--	NO
Calcium [3]	-- - --	2 / 2	48,000	101,000	VWW06-SD001-0211	74,500	37,477	241,814	69,628	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chromium	-- - --	2 / 2	13.6	13.8	VWW06-SD002-0211	13.7	0.14	14.3	13.7	81.0	0 / 2	0.17	NO	--	-- / --	--	--	--	NO
Cobalt	-- - --	2 / 2	4.95	5.82	VWW06-SD002-0211	5.39	0.62	8.13	5.37	10.0	0 / 2	0.58	NO	--	-- / --	--	--	--	NO
Copper	-- - --	2 / 2	27.5	37.4	VWW06-SD002-0211	32.5	7.00	63.7	32.1	34.0	1 / 2	1.10	YES	54.1	0 / 2	0.69	--	--	NO
Iron	-- - --	2 / 2	17,400	21,400	VWW06-SD002-0211	19,400	2,828	32,028	19,297	220,000	0 / 2	0.10	NO	--	-- / --	--	--	--	NO
Lead	-- - --	2 / 2	6.70	25.8	VWW06-SD002-0211	16.3	13.5	76.5	13.1	46.7	0 / 2	0.55	NO	--	-- / --	--	--	--	NO
Magnesium [3]	-- - --	2 / 2	9,290	10,900	VWW06-SD001-0211	10,095	1,138	15,178	10,063	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Manganese	-- - --	2 / 2	187	219	VWW06-SD002-0211	203	22.6	304	202	260	0 / 2	0.84	NO	--	-- / --	--	--	--	NO
Mercury	-- - --	2 / 2	0.039	0.10	VWW06-SD002-0211	0.072	0.046	0.28	0.064	0.15	0 / 2	0.69	NO	--	-- / --	--	--	--	NO
Nickel	-- - --	2 / 2	5.94	6.92	VWW06-SD002-0211	6.43	0.69	9.52	6.41	20.9	0 / 2	0.33	NO	--	-- / --	--	--	--	NO
Potassium [3]	-- - --	2 / 2	3,320	3,910	VWW06-SD001-0211	3,615	417	5,478	3,603	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Selenium	1.50 - 1.50	0 / 2	--	--	--	0.75	0.0	0.75	0.75	1.00	-- / --	1.50	YES	4.34	-- / --	0.35	--	--	NO
Silver	0.62 - 0.73	0 / 2	--	--	--	0.34	0.041	0.52	0.34	1.00	-- / --	0.73	NO	--	-- / --	--	--	--	NO

TABLE F-30
Screening Statistics - 2011 Sediment Samples - Offsite Laguna Kiani Complex Lobe
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Sodium [3]	-- - --	2 / 2	32,900	44,900	VWW06-SD001-0211	38,900	8,485	76,783	38,434	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Thallium	1.56 - 1.56	1 / 2	1.32	1.32	VWW06-SD002-0211	1.05	0.38	2.75	1.01	NSV	-- / --	NSV	YES	1.69	0 / 2	0.78	--	--	NO
Vanadium	-- - --	2 / 2	40.8	43.0	VWW06-SD002-0211	41.9	1.56	48.8	41.9	57.0	0 / 2	0.75	NO	--	-- / --	--	--	--	NO
Zinc	-- - --	2 / 2	39.6	64.7	VWW06-SD002-0211	52.2	17.7	131	50.6	150	0 / 2	0.43	NO	--	-- / --	--	--	--	NO
Other Parameters																			
Chromium (hexavalent) (UG/KG)	-- - --	2 / 2	36,900	38,600	VWW06-SD001-0211	37,750	1,202	43,117	37,740	NSV	-- / --	NSV	YES	219,000	0 / 2	0.18	--	--	NO
pH	-- - --	2 / 2	7.40	7.65	VWW06-SD002-0211	7.53	0.18	8.31	7.52	--	-- / --	--	--	--	-- / --	--	--	--	--
Total organic carbon (MG/KG)	-- - --	2 / 2	35,000	45,000	VWW06-SD002-0211	40,000	7,071	71,569	39,686	--	-- / --	--	--	--	-- / --	--	--	--	--

NSV - No Screening Value
1 - Count of detected samples exceeding or equaling Screening Value
2 - Shaded cells indicate hazard quotient based on reporting limits
3 - Macronutrient - Not considered to be a COPC

TABLE F-31
Comparison of Sediment Step 3A COPC Concentrations With Equilibrium Partitioning-Based Sediment Values - Laguna Kiani Complex Lobe
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Frequency of Detection	Maximum Concentration	95% UCL (Norm)	Arithmetic Mean	EqP-Based Value	Type	Reference	Mean TOC (%)	Normalized EqP-Based Value[1]	Frequency of Exceedance	Maximum Hazard Quotient	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Volatile Organic Compounds (UG/KG)														
2-Butanone	2 / 2	30.5	35.8	29.5	270	Fresh	Jones et al., 1997	4.00	1,080	0 / 2	0.03	0.03	0.03	NO
Acetone	2 / 2	207	481	156	3,278	Marine	Attachment B	4.00	13,112	0 / 2	0.02	0.04	0.01	NO
Carbon disulfide	2 / 2	17.0	36.9	13.3	0.85	Fresh	Jones et al., 1997	4.00	3.40	2 / 2	5.00	10.86	3.90	YES
Semivolatile Organic Compounds (UG/KG)														
Acenaphthene	0 / 2	66.8	110	19.0	1,100	Marine	USEPA 1996a	4.00	4,400	-- / --	0.02	0.03	0.00	NO
Fluorene	0 / 2	66.8	110	19.0	230	Marine	Washington State 1995	4.00	920	-- / --	0.07	0.12	0.02	NO
Pesticides (UG/KG)														
4,4'-DDD	1 / 2	1.50	2.03	1.40	9.92	Marine	Attachment B	4.00	39.7	0 / 2	0.04	0.05	0.04	NO
alpha-BHC	0 / 2	3.80	3.10	1.68	1,360	Marine	USEPA 2006b	4.00	5,440	-- / --	0.0007	0.0006	0.0003	NO
beta-BHC	0 / 2	0.77	0.64	0.34	1,360	Marine	alpha-BHC value	4.00	5,440	-- / --	0.0001	0.0001	0.0001	NO
delta-BHC	0 / 2	1.40	1.10	0.63	1,360	Marine	alpha-BHC value	4.00	5,440	-- / --	0.0003	0.0002	0.0001	NO
Endrin	0 / 2	1.30	1.05	0.58	3.50	Marine	USEPA 1996a	4.00	14.00	-- / --	0.09	0.07	0.04	NO
Endrin aldehyde	0 / 2	1.80	1.43	0.80	3.50	Marine	Endrin value	4.00	14.00	-- / --	0.13	0.10	0.06	NO
Endrin ketone	0 / 2	1.10	0.94	0.48	3.50	Marine	Endrin value	4.00	14.00	-- / --	0.08	0.07	0.03	NO
gamma-BHC (Lindane)	0 / 2	1.00	0.81	0.44	1,360	Marine	alpha-BHC value	4.00	5,440	-- / --	0.0002	0.0001	0.0001	NO
Heptachlor	0 / 2	1.00	0.81	0.44	2.96	Marine	Heptachlor epoxide value	4.00	11.85	-- / --	0.08	0.07	0.04	NO
Heptachlor epoxide	0 / 2	0.77	0.64	0.34	2.96	Marine	Attachment B	4.00	11.85	-- / --	0.06	0.05	0.03	NO

Shaded cells indicate ratios based upon reporting limits
NSV - No Screening Value

TABLE F-32
Screening Statistics - 2011 Sediment - PCB Removal Area
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Sediment Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Polychlorinated Biphenyls (UG/KG)																
Aroclor-1016	19.0 - 22.0	0 / 2	--	--	--	10.3	1.06	15.0	10.2	48.0	-- / --	0.46	NO	--	--	NO
Aroclor-1221	17.0 - 21.0	0 / 2	--	--	--	9.50	1.41	15.8	9.45	48.0	-- / --	0.44	NO	--	--	NO
Aroclor-1232	22.0 - 26.0	0 / 2	--	--	--	12.0	1.41	18.3	12.0	48.0	-- / --	0.54	NO	--	--	NO
Aroclor-1242	16.0 - 19.0	0 / 2	--	--	--	8.75	1.06	13.5	8.72	48.0	-- / --	0.40	NO	--	--	NO
Aroclor-1248	16.0 - 19.0	0 / 2	--	--	--	8.75	1.06	13.5	8.72	48.0	-- / --	0.40	NO	--	--	NO
Aroclor-1254	16.0 - 16.0	1 / 2	98.0	98.0	VWW06-SS012-0211	53.0	63.6	337	28.0	63.3	1 / 2	1.55	YES	5.33	0.84	NO
Aroclor-1260	8.80 - 10.0	0 / 2	--	--	--	4.70	0.42	6.59	4.69	48.0	-- / --	0.21	NO	--	--	NO

1 - Count of detected samples exceeding or equaling Screening Value
2 - Shaded cells indicate hazard quotient based on reporting limits

TABLE F-33
Screening Statistics for Plants and Soil Invertebrates - SWMU 6 Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL[5]	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Volatile Organic Compounds (UG/KG)																			
1,1,1-Trichloroethane	0.62 - 6.60	0 / 2	--	--	--	1.81	2.11	11.2	1.01	1,025	-- / --	0.01	NO	--	-- / --	--	--	--	NO
1,1,2,2-Tetrachloroethane	1.10 - 6.60	0 / 2	--	--	--	1.93	1.94	10.6	1.35	5,000	-- / --	0.001	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.20 - 1.20	0 / 1	--	--	--	0.60	--	--	0.60	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,1,2-Trichloroethane	1.60 - 6.60	0 / 2	--	--	--	2.05	1.77	9.94	1.62	2,000	-- / --	0.003	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethane	0.66 - 6.60	0 / 2	--	--	--	1.82	2.10	11.2	1.04	548	-- / --	0.01	NO	--	-- / --	--	--	--	NO
1,1-Dichloroethene	0.66 - 6.60	0 / 2	--	--	--	1.82	2.10	11.2	1.04	173	-- / --	0.04	NO	--	-- / --	--	--	--	NO
1,2,3-Trichlorobenzene	1.20 - 1.20	0 / 1	--	--	--	0.60	--	--	0.60	1,150	-- / --	0.001	NO	--	-- / --	--	--	--	NO
1,2,4-Trichlorobenzene	1.20 - 190	0 / 2	--	--	--	47.8	66.8	346	7.55	1,270	-- / --	0.15	NO	--	-- / --	--	--	--	NO
1,2-Dibromo-3-chloropropane	4.80 - 4.80	0 / 1	--	--	--	2.40	--	--	2.40	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,2-Dibromoethane	1.60 - 1.60	0 / 1	--	--	--	0.80	--	--	0.80	300	-- / --	0.01	NO	--	-- / --	--	--	--	NO
1,2-Dichlorobenzene	1.10 - 190	0 / 2	--	--	--	47.8	66.8	346	7.23	1,000	-- / --	0.19	NO	--	-- / --	--	--	--	NO
1,2-Dichloroethane	1.90 - 6.60	0 / 2	--	--	--	2.13	1.66	9.54	1.77	2,190	-- / --	0.003	NO	--	-- / --	--	--	--	NO
1,2-Dichloropropane	1.20 - 6.60	0 / 2	--	--	--	1.95	1.91	10.5	1.41	38,800	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
1,3-Dichlorobenzene	0.87 - 190	0 / 2	--	--	--	47.7	66.9	346	6.43	1,000	-- / --	0.19	NO	--	-- / --	--	--	--	NO
1,4-Dichlorobenzene	1.20 - 190	0 / 2	--	--	--	47.8	66.8	346	7.55	1,280	-- / --	0.15	NO	--	-- / --	--	--	--	NO
2-Butanone	2.70 - 33.0	0 / 2	--	--	--	8.93	10.7	56.8	4.72	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2-Hexanone	2.50 - 33.0	0 / 2	--	--	--	8.88	10.8	57.0	4.54	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Methyl-2-pentanone	3.10 - 33.0	0 / 2	--	--	--	9.03	10.6	56.2	5.06	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Acetone	66.0 - 66.0	1 / 2	4.60	4.60	VWW06-SD011-0211	18.8	20.1	108	12.3	NSV	-- / --	NSV	YES	--	-- / --	--	NSV	NSV	YES
Benzene	0.96 - 6.60	0 / 2	--	--	--	1.89	1.99	10.8	1.26	6.80	-- / --	0.97	NO	--	-- / --	--	--	--	NO
Bromochloromethane	1.70 - 1.70	0 / 1	--	--	--	0.85	--	--	0.85	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromodichloromethane	0.62 - 6.60	0 / 2	--	--	--	1.81	2.11	11.2	1.01	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Bromoform	0.89 - 6.60	0 / 2	--	--	--	1.87	2.02	10.9	1.21	300	-- / --	0.02	NO	--	-- / --	--	--	--	NO
Bromomethane	1.90 - 6.60	0 / 2	--	--	--	2.13	1.66	9.54	1.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Carbon disulfide	1.90 - 6.60	0 / 2	--	--	--	2.13	1.66	9.54	1.77	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Carbon tetrachloride	1.20 - 6.60	0 / 2	--	--	--	1.95	1.91	10.5	1.41	3,400	-- / --	0.002	NO	--	-- / --	--	--	--	NO
Chlorobenzene	0.67 - 6.60	0 / 2	--	--	--	1.82	2.10	11.2	1.05	2,400	-- / --	0.003	NO	--	-- / --	--	--	--	NO
Chloroethane	1.40 - 6.60	0 / 2	--	--	--	2.00	1.84	10.2	1.52	5,000	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Chloroform	1.00 - 6.60	0 / 2	--	--	--	1.90	1.98	10.7	1.28	1,844	-- / --	0.004	NO	--	-- / --	--	--	--	NO
Chloromethane	0.73 - 6.60	0 / 2	--	--	--	1.83	2.08	11.1	1.10	5,000	-- / --	0.001	NO	--	-- / --	--	--	--	NO
cis-1,2-Dichloroethene	1.20 - 6.60	0 / 2	--	--	--	1.95	1.91	10.5	1.41	447	-- / --	0.01	NO	--	-- / --	--	--	--	NO
cis-1,3-Dichloropropene	0.81 - 6.60	0 / 2	--	--	--	1.85	2.05	11.0	1.16	5,000	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Cyclohexane	1.90 - 1.90	0 / 1	--	--	--	0.95	--	--	0.95	6,000	-- / --	0.0003	NO	--	-- / --	--	--	--	NO
Dibromochloromethane	0.89 - 6.60	0 / 2	--	--	--	1.87	2.02	10.9	1.21	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Dichlorodifluoromethane (Freon-12)	1.20 - 1.20	0 / 1	--	--	--	0.60	--	--	0.60	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Ethylbenzene	1.30 - 6.60	0 / 2	--	--	--	1.98	1.87	10.3	1.46	18.0	-- / --	0.37	NO	--	-- / --	--	--	--	NO
Isopropylbenzene	1.20 - 1.20	0 / 1	--	--	--	0.60	--	--	0.60	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methyl acetate	3.80 - 3.80	0 / 1	--	--	--	1.90	--	--	1.90	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylcyclohexane	0.83 - 0.83	0 / 1	--	--	--	0.42	--	--	0.42	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Methylene chloride	2.30 - 13.0	0 / 2	--	--	--	3.83	3.78	20.7	2.73	1,250	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Methyl-tert-butyl ether (MTBE)	0.83 - 0.83	0 / 1	--	--	--	0.42	--	--	0.42	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Styrene	0.54 - 6.60	0 / 2	--	--	--	1.79	2.14	11.4	0.94	64,000	-- / --	0.0001	NO	--	-- / --	--	--	--	NO
Tetrachloroethene	6.60 - 6.60	1 / 2	2.00	2.00	VWW06-SD011-0211	2.65	0.92	6.75	2.57	200	0 / 2	0.01	NO	--	-- / --	--	--	--	NO
Toluene	0.56 - 6.60	0 / 2	--	--	--	1.79	2.14	11.3	0.96	40,000	-- / --	0.0002	NO	--	-- / --	--	--	--	NO
trans-1,2-Dichloroethene	0.75 - 6.60	0 / 2	--	--	--	1.84	2.07	11.1	1.11	447	-- / --	0.01	NO	--	-- / --	--	--	--	NO
trans-1,3-Dichloropropene	1.90 - 6.60	0 / 2	--	--	--	2.13	1.66	9.54	1.77	5,000	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Trichloroethene	0.85 - 6.60	0 / 2	--	--	--	1.86	2.03	10.9	1.18	10.0	-- / --	0.66	NO	--	-- / --	--	--	--	NO
Trichlorofluoromethane (Freon-11)	0.85 - 0.85	0 / 1	--	--	--	0.43	--	--	0.43	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Vinyl chloride	1.20 - 6.60	0 / 2	--	--	--	1.95	1.91	10.5	1.41	412	-- / --	0.02	NO	--	-- / --	--	--	--	NO
Xylene, total	1.30 - 20.0	0 / 2	--	--	--	5.33	6.61	34.8	2.55	2,400	-- / --	0.01	NO	--	-- / --	--	--	--	NO

TABLE F-33
Screening Statistics for Plants and Soil Invertebrates - SWMU 6 Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL[5]	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Semivolatile Organic Compounds (UG/KG)																			
1-Methylnaphthalene	11.6 - 300	0 / 2	--	--	--	77.9	102	533	29.5	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
2,2'-Oxybis(1-chloropropane)	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2,4,5-Trichlorophenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	1,350	-- / --	0.14	NO	--	-- / --	--	--	--	NO
2,4,6-Trichlorophenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	580	-- / --	0.33	NO	--	-- / --	--	--	--	NO
2,4-Dichlorophenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	500	-- / --	0.38	NO	--	-- / --	--	--	--	NO
2,4-Dimethylphenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	1,000	-- / --	0.19	NO	--	-- / --	--	--	--	NO
2,4-Dinitrophenol	930 - 930	0 / 1	--	--	--	465	--	--	465	20,000	-- / --	0.05	NO	--	-- / --	--	--	--	NO
2,4-Dinitrotoluene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	11,000	-- / --	0.01	NO	--	-- / --	--	--	--	NO
2,6-Dinitrotoluene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	8,500	-- / --	0.02	NO	--	-- / --	--	--	--	NO
2-Chloronaphthalene	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
2-Chlorophenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	500	-- / --	0.38	NO	--	-- / --	--	--	--	NO
2-Methylnaphthalene	11.6 - 190	0 / 2	--	--	--	50.4	63.1	332	23.5	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
2-Methylphenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	1,000	-- / --	0.19	NO	--	-- / --	--	--	--	NO
2-Nitroaniline	370 - 370	0 / 1	--	--	--	185	--	--	185	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2-Nitrophenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	1,000	-- / --	0.19	NO	--	-- / --	--	--	--	NO
3- and 4-Methylphenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	1,000	-- / --	0.19	NO	--	-- / --	--	--	--	NO
3,3'-Dichlorobenzidine	370 - 370	0 / 1	--	--	--	185	--	--	185	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
3-Nitroaniline	370 - 370	0 / 1	--	--	--	185	--	--	185	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4,6-Dinitro-2-methylphenol	370 - 370	0 / 1	--	--	--	185	--	--	185	1,000	-- / --	0.37	NO	--	-- / --	--	--	--	NO
4-Bromophenyl-phenylether	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Chloro-3-methylphenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	500	-- / --	0.38	NO	--	-- / --	--	--	--	NO
4-Chloroaniline	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	500	-- / --	0.38	NO	--	-- / --	--	--	--	NO
4-Chlorophenyl-phenylether	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Nitroaniline	370 - 370	0 / 1	--	--	--	185	--	--	185	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Nitrophenol	930 - 930	0 / 1	--	--	--	465	--	--	465	380	-- / --	2.45	YES	--	-- / --	--	--	1.22	NO[4]
Acenaphthene	11.6 - 190	0 / 2	--	--	--	50.4	63.1	332	23.5	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Acenaphthylene	11.6 - 190	0 / 2	--	--	--	50.4	63.1	332	23.5	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Anthracene	11.6 - 190	0 / 2	--	--	--	50.4	63.1	332	23.5	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Benzo(a)anthracene	-- - --	2 / 2	30.6	66.4	116701-06-Z-136	48.5	25.3	162	45.1	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Benzo(a)pyrene	-- - --	2 / 2	29.1	84.7	116701-06-Z-136	56.9	39.3	232	49.6	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Benzo(b)fluoranthene	-- - --	2 / 2	41.2	119	116701-06-Z-136	80.1	55.0	326	70.0	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Benzo(g,h,i)perylene	-- - --	2 / 2	17.2	43.2	116701-06-Z-136	30.2	18.4	112	27.3	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Benzo(k)fluoranthene	-- - --	2 / 2	15.2	45.3	116701-06-Z-136	30.3	21.3	125	26.2	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Benzoic acid	930 - 930	0 / 1	--	--	--	465	--	--	465	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Benzyl alcohol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
bis(2-Chloroethoxy)methane	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
bis(2-Chloroethyl)ether	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
bis(2-Ethylhexyl)phthalate	370 - 370	0 / 1	--	--	--	185	--	--	185	30,000	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Butylbenzylphthalate	370 - 370	0 / 1	--	--	--	185	--	--	185	30,000	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Carbazole	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chrysene	-- - --	2 / 2	26.5	65.1	116701-06-Z-136	45.8	27.3	168	41.5	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Dibenz(a,h)anthracene	14.5 - 30.0	0 / 2	--	--	--	11.1	5.48	35.6	10.4	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Dibenzofuran	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Diethylphthalate	370 - 370	0 / 1	--	--	--	185	--	--	185	26,800	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Dimethyl phthalate	370 - 370	0 / 1	--	--	--	185	--	--	185	10,640	-- / --	0.03	NO	--	-- / --	--	--	--	NO
Di-n-butylphthalate	370 - 370	0 / 1	--	--	--	185	--	--	185	40,000	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Di-n-octylphthalate	370 - 370	0 / 1	--	--	--	185	--	--	185	30,000	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Fluoranthene	-- - --	2 / 2	43.6	48.5	116701-06-Z-136	46.1	3.46	61.5	46.0	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Fluorene	11.6 - 190	0 / 2	--	--	--	50.4	63.1	332	23.5	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Hexachlorobenzene	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	1,000	-- / --	0.19	NO	--	-- / --	--	--	--	NO
Hexachlorobutadiene	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Hexachlorocyclopentadiene	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	2,000	-- / --	0.10	NO	--	-- / --	--	--	--	NO
Hexachloroethane	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO

TABLE F-33
Screening Statistics for Plants and Soil Invertebrates - SWMU 6 Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL[5]	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Indeno(1,2,3-cd)pyrene	-- - --	2 / 2	16.8	60.8	116701-06-Z-136	38.8	31.1	178	32.0	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Isophorone	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Naphthalene	11.6 - 190	0 / 2	--	--	--	50.4	63.1	332	23.5	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
n-Nitroso-di-n-propylamine	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
n-Nitrosodiphenylamine	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	1,090	-- / --	0.17	NO	--	-- / --	--	--	--	NO
Nitrobenzene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	2,260	-- / --	0.07	NO	--	-- / --	--	--	--	NO
PAH (HMW)	-- - --	2 / 2	223	540	116701-06-Z-136	381	224	1,382	347	18,000	0 / 2	0.03	NO	--	-- / --	--	--	--	NO
PAH (LMW)	-- - --	2 / 2	95.9	809	116701-06-Z-136	452	504	2,702	278	29,000	0 / 2	0.03	NO	--	-- / --	--	--	--	NO
Pentachlorophenol	930 - 930	0 / 1	--	--	--	465	--	--	465	5,000	-- / --	0.19	NO	--	-- / --	--	--	--	NO
Phenanthrene	190 - 190	1 / 2	17.5	17.5	VWW06-SD011-0211	56.3	54.8	301	40.8	LMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Phenol	190 - 190	0 / 1	--	--	--	95.0	--	--	95.0	1,880	-- / --	0.10	NO	--	-- / --	--	--	--	NO
Pyrene	-- - --	2 / 2	38.8	40.3	116701-06-Z-136	39.6	1.06	44.3	39.5	HMW PAH	-- / --	--	NO	--	-- / --	--	--	--	NO
Pesticide/Polychlorinated Biphenyls (UG/KG)																			
4,4'-DDD	3.70 - 3.70	1 / 2	1.70	1.70	VWW06-SD011-0211	1.78	0.11	2.25	1.77	583	0 / 2	0.003	NO	--	-- / --	--	--	--	NO
4,4'-DDE	3.70 - 3.70	1 / 2	16.0	16.0	VWW06-SD011-0211	8.93	10.0	53.6	5.44	114	0 / 2	0.14	NO	--	-- / --	--	--	--	NO
4,4'-DDT	3.70 - 3.70	1 / 2	7.00	7.00	VWW06-SD011-0211	4.43	3.64	20.7	3.60	100	0 / 2	0.07	NO	--	-- / --	--	--	--	NO
Aldrin	0.26 - 1.80	0 / 2	--	--	--	0.52	0.54	2.95	0.34	3.63	-- / --	0.50	NO	--	-- / --	--	--	--	NO
alpha-BHC	1.30 - 1.80	0 / 2	--	--	--	0.78	0.18	1.56	0.76	226	-- / --	0.01	NO	--	-- / --	--	--	--	NO
alpha-Chlordane	0.28 - 1.80	0 / 2	--	--	--	0.52	0.54	2.92	0.35	11.0	-- / --	0.16	NO	--	-- / --	--	--	--	NO
Aroclor-1016	18.0 - 22.0	0 / 2	--	--	--	10.0	1.41	16.3	9.95	8,000	-- / --	0.003	NO	--	-- / --	--	--	--	NO
Aroclor-1221	18.0 - 21.0	0 / 2	--	--	--	9.75	1.06	14.5	9.72	8,000	-- / --	0.003	NO	--	-- / --	--	--	--	NO
Aroclor-1232	18.0 - 26.0	0 / 2	--	--	--	11.0	2.83	23.6	10.8	8,000	-- / --	0.003	NO	--	-- / --	--	--	--	NO
Aroclor-1242	18.0 - 19.0	0 / 2	--	--	--	9.25	0.35	10.8	9.25	8,000	-- / --	0.002	NO	--	-- / --	--	--	--	NO
Aroclor-1248	18.0 - 19.0	0 / 2	--	--	--	9.25	0.35	10.8	9.25	8,000	-- / --	0.002	NO	--	-- / --	--	--	--	NO
Aroclor-1254	18.0 - 18.0	1 / 2	120	120	VWW06-SD011-0211	64.5	78.5	415	32.9	8,000	0 / 2	0.02	NO	--	-- / --	--	--	--	NO
Aroclor-1260	10.0 - 18.0	0 / 2	--	--	--	7.00	2.83	19.6	6.71	8,000	-- / --	0.002	NO	--	-- / --	--	--	--	NO
Polychlorinated biphenyls (PCBs)	37.0 - 37.0	0 / 1	--	--	--	18.5	--	--	18.5	8,000	-- / --	0.005	NO	--	-- / --	--	--	--	NO
beta-BHC	0.26 - 1.80	0 / 2	--	--	--	0.52	0.54	2.95	0.34	342	-- / --	0.01	NO	--	-- / --	--	--	--	NO
delta-BHC	0.48 - 1.80	0 / 2	--	--	--	0.57	0.47	2.65	0.46	226	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Dieldrin	0.28 - 1.80	0 / 2	--	--	--	0.52	0.54	2.92	0.35	10.5	-- / --	0.17	NO	--	-- / --	--	--	--	NO
Endosulfan I	0.38 - 1.80	0 / 2	--	--	--	0.55	0.50	2.79	0.41	6.32	-- / --	0.28	NO	--	-- / --	--	--	--	NO
Endosulfan II	0.50 - 1.80	0 / 2	--	--	--	0.58	0.46	2.63	0.47	6.32	-- / --	0.28	NO	--	-- / --	--	--	--	NO
Endosulfan sulfate	0.35 - 3.70	0 / 2	--	--	--	1.01	1.18	6.30	0.57	6.32	-- / --	0.59	NO	--	-- / --	--	--	--	NO
Endrin	0.45 - 3.70	0 / 2	--	--	--	1.04	1.15	6.17	0.65	1.95	-- / --	1.90	YES	16.0	-- / --	0.23	--	--	NO
Endrin aldehyde	0.62 - 3.70	0 / 2	--	--	--	1.08	1.09	5.94	0.76	1.95	-- / --	1.90	YES	11.0	-- / --	0.34	--	--	NO
Endrin ketone	0.36 - 3.70	0 / 2	--	--	--	1.02	1.18	6.29	0.58	1.95	-- / --	1.90	YES	--	-- / --	--	3.22	0.52	NO
gamma-BHC (Lindane)	0.35 - 1.80	0 / 2	--	--	--	0.54	0.51	2.83	0.40	7.75	-- / --	0.23	NO	--	-- / --	--	--	--	NO
gamma-Chlordane	0.30 - 1.80	0 / 2	--	--	--	0.53	0.53	2.89	0.37	11.0	-- / --	0.16	NO	--	-- / --	--	--	--	NO
Heptachlor	0.35 - 1.80	0 / 2	--	--	--	0.54	0.51	2.83	0.40	52.9	-- / --	0.03	NO	--	-- / --	--	--	--	NO
Heptachlor epoxide	0.26 - 1.80	0 / 2	--	--	--	0.52	0.54	2.95	0.34	52.9	-- / --	0.03	NO	--	-- / --	--	--	--	NO
Methoxychlor	0.47 - 3.70	0 / 2	--	--	--	1.04	1.14	6.14	0.66	500	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Toxaphene	43.0 - 92.0	0 / 2	--	--	--	33.8	17.3	111	31.4	500	-- / --	0.18	NO	--	-- / --	--	--	--	NO

TABLE F-33
Screening Statistics for Plants and Soil Invertebrates - SWMU 6 Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL[5]	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Explosives (UG/KG)																			
1,3,5-Trinitrobenzene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
1,3-Dinitrobenzene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
2,4,6-Trinitrotoluene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	10,000	-- / --	0.02	NO	--	-- / --	--	--	--	NO
2-Amino-4,6-dinitrotoluene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	80,000	-- / --	0.002	NO	--	-- / --	--	--	--	NO
2-Nitrotoluene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
3-Nitrotoluene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Amino-2,6-dinitrotoluene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
4-Nitrotoluene	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
HMX	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	10,000	-- / --	0.02	NO	--	-- / --	--	--	--	NO
RDX	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	10,000	-- / --	0.02	NO	--	-- / --	--	--	--	NO
Tetryl	160 - 160	0 / 1	--	--	--	80.0	--	--	80.0	10,000	-- / --	0.02	NO	--	-- / --	--	--	--	NO
Inorganics (MG/KG)																			
Aluminum	-- - --	2 / 2	5,610	16,200	116701-06-Z-136	10,905	7,488	44,336	9,533	pH <5.5	0 / 1	--	NO	--	-- / --	--	--	--	NO
Antimony	0.48 - 0.48	1 / 2	1.30	1.30	116701-06-Z-136	0.77	0.75	4.11	0.56	78.0	0 / 2	0.02	NO	--	-- / --	--	--	--	NO
Arsenic	-- - --	2 / 2	0.48	1.20	VWW06-SD011-0211	0.84	0.51	3.11	0.76	18.0	0 / 2	0.07	NO	--	-- / --	--	--	--	NO
Barium	-- - --	2 / 2	48.9	49.8	VWW06-SD011-0211	49.4	0.64	52.2	49.3	330	0 / 2	0.15	NO	--	-- / --	--	--	--	NO
Beryllium	2.94 - 2.94	1 / 2	0.30	0.30	116701-06-Z-136	0.89	0.83	4.58	0.66	40.0	0 / 2	0.01	NO	--	-- / --	--	--	--	NO
Cadmium	0.42 - 0.42	1 / 2	0.50	0.50	VWW06-SD011-0211	0.36	0.21	1.27	0.32	32.0	0 / 2	0.02	NO	--	-- / --	--	--	--	NO
Calcium [3]	-- - --	2 / 2	4,180	107,000	VWW06-SD011-0211	55,590	72,705	380,180	21,149	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Chromium	-- - --	2 / 2	6.60	24.6	116701-06-Z-136	15.6	12.7	72.4	12.7	64.0	0 / 2	0.38	NO	--	-- / --	--	--	--	NO
Cobalt	-- - --	2 / 2	4.05	16.5	116701-06-Z-136	10.3	8.80	49.6	8.17	13.0	1 / 2	1.27	YES	13.0	1 / 2	1.27	3.81	0.79	NO
Copper	-- - --	2 / 2	51.6	72.0	VWW06-SD011-0211	61.8	14.4	126	61.0	70.0	1 / 2	1.03	YES	35.0	2 / 2	2.06	1.80	0.88	NO
Cyanide	0.13 - 0.13	0 / 1	--	--	--	0.065	--	--	0.065	15.8	-- / --	0.01	NO	--	-- / --	--	--	--	NO
Iron	-- - --	2 / 2	11,900	32,200	116701-06-Z-136	22,050	14,354	86,135	19,575	5 < pH > 8	1 / 1	--	YES	18,000	1 / 2	1.79	--	--	YES
Lead	-- - --	2 / 2	4.00	12.7	VWW06-SD011-0211	8.35	6.15	35.8	7.13	120	0 / 2	0.11	NO	--	-- / --	--	--	--	NO
Magnesium [3]	-- - --	2 / 2	5,380	11,500	116701-06-Z-136	8,440	4,327	27,760	7,866	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Manganese	-- - --	2 / 2	247	911	116701-06-Z-136	579	470	2,675	474	220	2 / 2	4.14	YES	360	1 / 2	2.53	12.2	2.63	YES
Mercury	0.093 - 0.093	1 / 2	0.011	0.011	VWW06-SD011-0211	0.029	0.025	0.14	0.022	0.10	0 / 2	0.11	NO	--	-- / --	--	--	--	NO
Nickel	-- - --	2 / 2	3.56	16.6	116701-06-Z-136	10.1	9.22	51.2	7.69	38.0	0 / 2	0.44	NO	--	-- / --	--	--	--	NO
Potassium [3]	-- - --	2 / 2	640	874	VWW06-SD011-0211	757	165	1,496	748	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Selenium	0.54 - 11.0	0 / 2	--	--	--	2.89	3.70	19.4	1.22	0.52	-- / --	21.2	YES	2.00	-- / --	5.50	37.3	5.55	NO[4]
Silver	0.32 - 0.53	0 / 2	--	--	--	0.21	0.074	0.54	0.21	560	-- / --	0.001	NO	--	-- / --	--	--	--	NO
Sodium [3]	-- - --	2 / 2	3,110	5,390	VWW06-SD011-0211	4,250	1,612	11,448	4,094	NSV	-- / --	NSV	NO	--	-- / --	--	--	--	NO
Thallium	6.24 - 22.0	0 / 2	--	--	--	7.06	5.57	31.9	5.86	1.00	-- / --	22.0	YES	0.67	-- / --	32.8	31.9	7.06	NO[4]
Vanadium	-- - --	2 / 2	35.0	108	116701-06-Z-136	71.5	51.6	302	61.5	130	0 / 2	0.83	NO	--	-- / --	--	--	--	NO
Zinc	-- - --	2 / 2	51.5	58.0	VWW06-SD011-0211	54.8	4.60	75.3	54.7	120	0 / 2	0.48	NO	--	-- / --	--	--	--	NO
Other Parameters																			
Chromium (hexavalent) (UG/KG)	-- - --	1 / 1	2,380	2,380	VWW06-SD011-0211	2,380	--	--	2,380	400	1 / 1	5.95	YES	--	-- / --	--	--	5.95	YES
pH	-- - --	1 / 1	8.05	8.05	VWW06-SD011-0211	8.05	--	--	8.05	--	-- / --	--	--	--	-- / --	--	--	--	--
Total organic carbon (MG/KG)	-- - --	1 / 1	8,500	8,500	VWW06-SD011-0211	8,500	--	--	8,500	--	-- / --	--	--	--	-- / --	--	--	--	--
Total Petroleum Hydrocarbons (UG/KG)																			
TPH-diesel range	-- - --	1 / 1	37,200	37,200	116701-06-Z-136	37,200	--	--	37,200	NSV	-- / --	NSV	YES	--	-- / --	--	NSV	NSV	YES
TPH-gas range	6,200 - 6,200	0 / 1	--	--	--	3,100	--	--	3,100	NSV	-- / --	NSV	NO	--	-- / --	--	NSV	NSV	NO

NSV - No Screening Value
1 - Count of detected samples exceeding or equaling Screening Value
2 - Shaded cells indicate hazard quotient based on reporting limits
3 - Macronutrient - Not considered to be a COPC
4 - See Uncertainty Section
5 - Soil type Qs; combined set if no Qs value available

TABLE F-34
Reporting Limit to Screening Value Comparison
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Units	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Mean Concentration	Screening Value	Minimum Ratio	Maximum Ratio	Mean Ratio
Surface Water - SWMU 6 Lagoon									
4,4'-DDD	UG/L	0 / 5	0.0053	0.0054	0.0027	0.0010	5.30	5.40	2.69
4,4'-DDE	UG/L	0 / 5	0.0078	0.0079	0.0039	0.0010	7.80	7.90	3.93
4,4'-DDT	UG/L	0 / 5	0.0022	0.0023	0.0011	0.0010	2.20	2.30	1.14
alpha-Chlordane	UG/L	0 / 5	0.0062	0.0062	0.0031	0.0040	1.55	1.55	0.78
Endosulfan I	UG/L	0 / 5	0.0088	0.0090	0.0045	0.0087	1.01	1.03	0.51
Endrin ketone	UG/L	0 / 5	0.012	0.012	0.006	0.010	1.20	1.20	0.60
gamma-Chlordane	UG/L	0 / 5	0.0049	0.0050	0.0025	0.0040	1.23	1.25	0.62
Heptachlor	UG/L	0 / 5	0.0081	0.0082	0.0041	0.0036	2.25	2.28	1.14
Toxaphene	UG/L	0 / 5	0.37	0.38	0.19	0.21	1.76	1.81	0.89
Arsenic (total)	UG/L	0 / 5	25.0	132	55.3	36.0	0.69	3.67	1.54
Copper (total)	UG/L	0 / 5	25.0	108	45.7	3.73	6.70	29.0	12.3
Lead (total)	UG/L	0 / 5	10.0	20.0	9.00	8.52	1.17	2.35	1.06
Nickel (total)	UG/L	0 / 5	37.2	37.2	18.6	8.28	4.49	4.49	2.25
Selenium (total)	UG/L	0 / 5	164	164	82.0	71.1	2.31	2.31	1.15
Silver (total)	UG/L	0 / 5	2.50	20.8	6.99	2.24	1.12	9.29	3.12
Zinc (total)	UG/L	0 / 5	160	160	80.0	85.6	1.87	1.87	0.93
Arsenic (dissolved)	UG/L	0 / 5	132	132	66.2	36.0	3.68	3.68	1.84
Cadmium (dissolved)	UG/L	0 / 5	10.0	28.8	12.5	8.80	1.14	3.27	1.42
Copper (dissolved)	UG/L	0 / 5	108	108	54.0	3.10	34.8	34.8	17.4
Lead (dissolved)	UG/L	0 / 5	10.0	20.0	9.00	8.10	1.23	2.47	1.11
Nickel (dissolved)	UG/L	0 / 5	37.2	37.2	18.6	8.20	4.54	4.54	2.27
Selenium (dissolved)	UG/L	0 / 5	164	164	82.0	71.0	2.31	2.31	1.15
Silver (dissolved)	UG/L	0 / 5	2.50	20.8	8.57	2.24	1.12	9.29	3.83
Thallium (dissolved)	UG/L	0 / 5	176	176	88.0	21.3	8.26	8.26	4.13
Zinc (dissolved)	UG/L	0 / 5	160	160	80.0	81.0	1.98	1.98	0.99

TABLE F-34
Reporting Limit to Screening Value Comparison
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Units	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Mean Concentration	Screening Value	Minimum Ratio	Maximum Ratio	Mean Ratio
Surface Water - Laguna Kiani Complex Lobe									
4,4'-DDD	UG/L	0 / 2	0.0053	0.0054	0.0027	0.0010	5.30	5.40	2.68
4,4'-DDE	UG/L	0 / 2	0.0078	0.0079	0.0039	0.0010	7.80	7.90	3.93
4,4'-DDT	UG/L	0 / 2	0.0022	0.0023	0.0011	0.0010	2.20	2.30	1.13
alpha-Chlordane	UG/L	0 / 2	0.0062	0.0062	0.0031	0.0040	1.55	1.55	0.78
Endosulfan I	UG/L	0 / 2	0.0088	0.0089	0.0044	0.0087	1.01	1.02	0.51
Endrin ketone	UG/L	0 / 2	0.012	0.012	0.0060	0.010	1.20	1.20	0.60
gamma-Chlordane	UG/L	0 / 2	0.0049	0.0050	0.0025	0.0040	1.23	1.25	0.62
Heptachlor	UG/L	0 / 2	0.0081	0.0082	0.0041	0.0036	2.25	2.28	1.13
Toxaphene	UG/L	0 / 2	0.37	0.37	0.19	0.21	1.76	1.76	0.88
Arsenic (total)	UG/L	0 / 2	66.2	66.2	33.1	36.0	1.84	1.84	0.92
Nickel (total)	UG/L	0 / 2	18.6	18.6	9.30	8.28	2.25	2.25	1.12
Silver (total)	UG/L	0 / 2	10.4	10.4	5.20	2.24	4.64	4.64	2.32
Thallium (total)	UG/L	0 / 2	88.0	88.0	44.0	21.3	4.13	4.13	2.07
Aluminum (dissolved)	UG/L	0 / 1	186	186	93.0	87.0	2.14	2.14	1.07
Arsenic (dissolved)	UG/L	0 / 2	66.2	66.2	33.1	36.0	1.84	1.84	0.92
Cadmium (dissolved)	UG/L	0 / 2	14.4	14.4	7.20	8.80	1.64	1.64	0.82
Copper (dissolved)	UG/L	0 / 2	54.0	54.0	27.0	3.10	17.4	17.4	8.71
Lead (dissolved)	UG/L	0 / 2	20.0	20.0	10.0	8.10	2.47	2.47	1.23
Nickel (dissolved)	UG/L	0 / 2	18.6	18.6	9.30	8.20	2.27	2.27	1.13
Silver (dissolved)	UG/L	0 / 2	10.4	10.4	5.20	2.24	4.64	4.64	2.32
Thallium (dissolved)	UG/L	0 / 2	88.0	88.0	44.0	21.3	4.13	4.13	2.07
Sediment - SWMU 6 Lagoon									
Ethylbenzene	UG/KG	0 / 8	1.40	4.80	1.31	4.00	0.35	1.20	0.33
Xylene, total	UG/KG	0 / 8	1.40	4.80	1.30	4.00	0.35	1.20	0.33
alpha-BHC	UG/KG	0 / 8	1.50	7.40	2.17	0.32	4.69	23.1	6.78
Aroclor-1016	UG/KG	0 / 8	26.0	64.0	19.5	48.0	0.54	1.33	0.41
Aroclor-1221	UG/KG	0 / 8	24.0	59.0	18.0	48.0	0.50	1.23	0.38
Aroclor-1232	UG/KG	0 / 8	30.0	74.0	22.6	48.0	0.63	1.54	0.47
Aroclor-1242	UG/KG	0 / 8	22.0	54.0	16.5	48.0	0.46	1.13	0.34
Aroclor-1248	UG/KG	0 / 8	22.0	54.0	16.5	48.0	0.46	1.13	0.34
beta-BHC	UG/KG	0 / 8	0.30	1.50	0.43	0.32	0.94	4.69	1.35

TABLE F-34
Reporting Limit to Screening Value Comparison
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Units	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Mean Concentration	Screening Value	Minimum Ratio	Maximum Ratio	Mean Ratio
delta-BHC	UG/KG	0 / 8	0.56	2.80	0.80	0.32	1.75	8.75	2.51
Dieldrin	UG/KG	0 / 8	0.32	1.60	0.46	0.72	0.45	2.24	0.65
Endrin	UG/KG	0 / 8	0.52	2.60	0.75	0.020	26.0	130	37.3
Endrin aldehyde	UG/KG	0 / 8	0.72	3.50	1.02	0.020	36.0	175	51.0
Endrin ketone	UG/KG	0 / 8	0.42	2.10	0.61	0.020	21.0	105	30.4
gamma-BHC (Lindane)	UG/KG	0 / 8	0.40	2.00	0.57	0.32	1.25	6.25	1.78
Heptachlor	UG/KG	0 / 8	0.40	2.00	0.57	0.30	1.33	6.67	1.90
Heptachlor epoxide	UG/KG	0 / 8	0.30	1.50	0.43	0.30	1.00	5.00	1.44
Selenium	MG/KG	0 / 8	0.47	1.40	0.40	1.00	0.47	1.40	0.40
Sediment - Laguna Kiani Complex Lobe									
1,2,4-Trichlorobenzene	UG/KG	0 / 2	4.80	4.80	2.40	4.80	1.00	1.00	0.50
Ethylbenzene	UG/KG	0 / 2	5.20	5.20	2.60	4.00	1.30	1.30	0.65
Xylene, total	UG/KG	0 / 2	5.10	5.10	2.55	4.00	1.28	1.28	0.64
Acenaphthene	UG/KG	0 / 2	9.00	66.8	19.0	16.0	0.56	4.18	1.18
Acenaphthylene	UG/KG	0 / 2	9.00	66.8	19.0	44.0	0.20	1.52	0.43
Dibenz(a,h)anthracene	UG/KG	0 / 2	11.2	83.6	23.7	63.4	0.18	1.32	0.37
Fluorene	UG/KG	0 / 2	9.00	66.8	19.0	19.0	0.47	3.52	1.00
4,4'-DDT	UG/KG	0 / 2	1.50	2.00	0.88	1.19	1.26	1.68	0.74
alpha-BHC	UG/KG	0 / 2	2.90	3.80	1.68	0.32	9.06	11.9	5.23
Aroclor-1016	UG/KG	0 / 2	50.0	67.0	29.3	48.0	1.04	1.40	0.61
Aroclor-1221	UG/KG	0 / 2	46.0	62.0	27.0	48.0	0.96	1.29	0.56
Aroclor-1232	UG/KG	0 / 2	58.0	77.0	33.8	48.0	1.21	1.60	0.70
Aroclor-1242	UG/KG	0 / 2	42.0	56.0	24.5	48.0	0.88	1.17	0.51
Aroclor-1248	UG/KG	0 / 2	42.0	56.0	24.5	48.0	0.88	1.17	0.51
beta-BHC	UG/KG	0 / 2	0.58	0.77	0.34	0.32	1.81	2.41	1.05
delta-BHC	UG/KG	0 / 2	1.10	1.40	0.63	0.32	3.44	4.38	1.95
Dieldrin	UG/KG	0 / 2	0.62	0.82	0.36	0.72	0.87	1.15	0.50
Endrin	UG/KG	0 / 2	1.00	1.30	0.58	0.020	50.0	65.0	28.8
Endrin aldehyde	UG/KG	0 / 2	1.40	1.80	0.80	0.020	70.0	90.0	40.0
Endrin ketone	UG/KG	0 / 2	0.81	1.10	0.48	0.020	40.5	55.0	23.9
gamma-BHC (Lindane)	UG/KG	0 / 2	0.77	1.00	0.44	0.32	2.41	3.13	1.38
Heptachlor	UG/KG	0 / 2	0.77	1.00	0.44	0.30	2.57	3.33	1.48

TABLE F-34
Reporting Limit to Screening Value Comparison
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Units	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Mean Concentration	Screening Value	Minimum Ratio	Maximum Ratio	Mean Ratio
Heptachlor epoxide	UG/KG	0 / 2	0.58	0.77	0.34	0.30	1.93	2.57	1.13
Selenium	MG/KG	0 / 2	1.50	1.50	0.75	1.00	1.50	1.50	0.75
SWMU 6 Surface Soil									
4-Nitrophenol	UG/KG	0 / 1	930	930	465	380	2.45	2.45	1.22
Endrin	UG/KG	0 / 2	0.45	3.70	1.04	1.95	0.23	1.90	0.53
Endrin aldehyde	UG/KG	0 / 2	0.62	3.70	1.08	1.95	0.32	1.90	0.55
Endrin ketone	UG/KG	0 / 2	0.36	3.70	1.02	1.95	0.18	1.90	0.52
Selenium	MG/KG	0 / 2	0.54	11.0	2.89	0.52	1.04	21.2	5.55
Thallium	MG/KG	0 / 2	6.24	22.0	7.06	1.00	6.24	22.0	7.06

Shaded cells indicate ratio > 1

Figures

North

0 300 600 Feet

LEGEND

SWMU 6 Access Restriction Boundary

FIGURE F-1
Aerial Photograph of SWMU 6
Vieques, Puerto Rico

CH2MHILL

ES042110171949TPA FC-1 Aerial Photograph of SWMU 6-rev2.ai

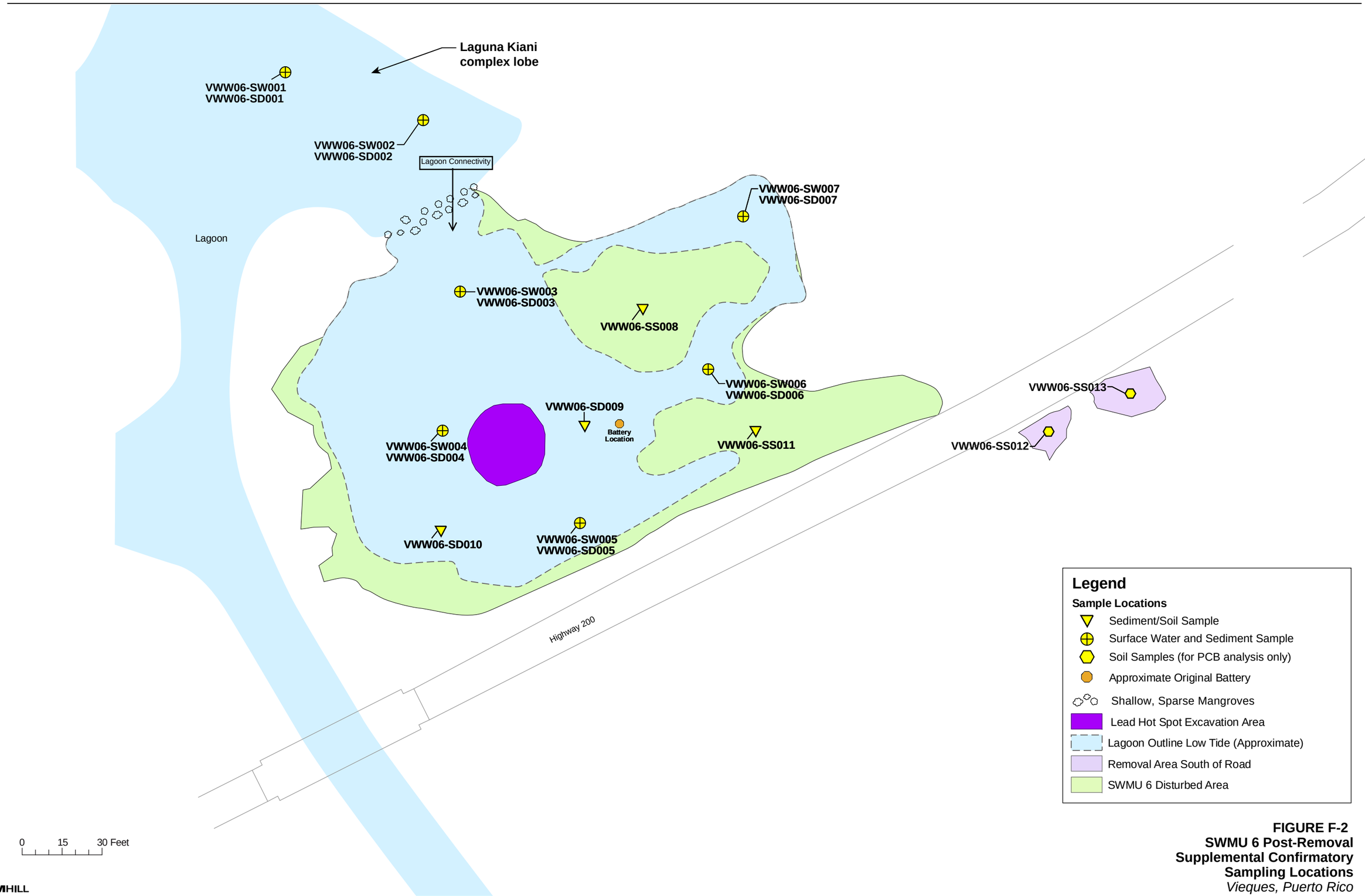


FIGURE F-2
SWMU 6 Post-Removal Supplemental Confirmatory Sampling Locations
Vieques, Puerto Rico

Legend

- Background Surface Water and Sediment Sample Locations
- SWMU 6

N
W E
S

0 175 350 700
Feet

FIGURE F-3
SWMU 6 Background Surface Water and Sediment Sample Locations
Former NASD, Vieques, Puerto Rico

CH2MHILL

ES042110171949TPA FC-3 SWMU6 Background SW and DW Sample Locations.ai

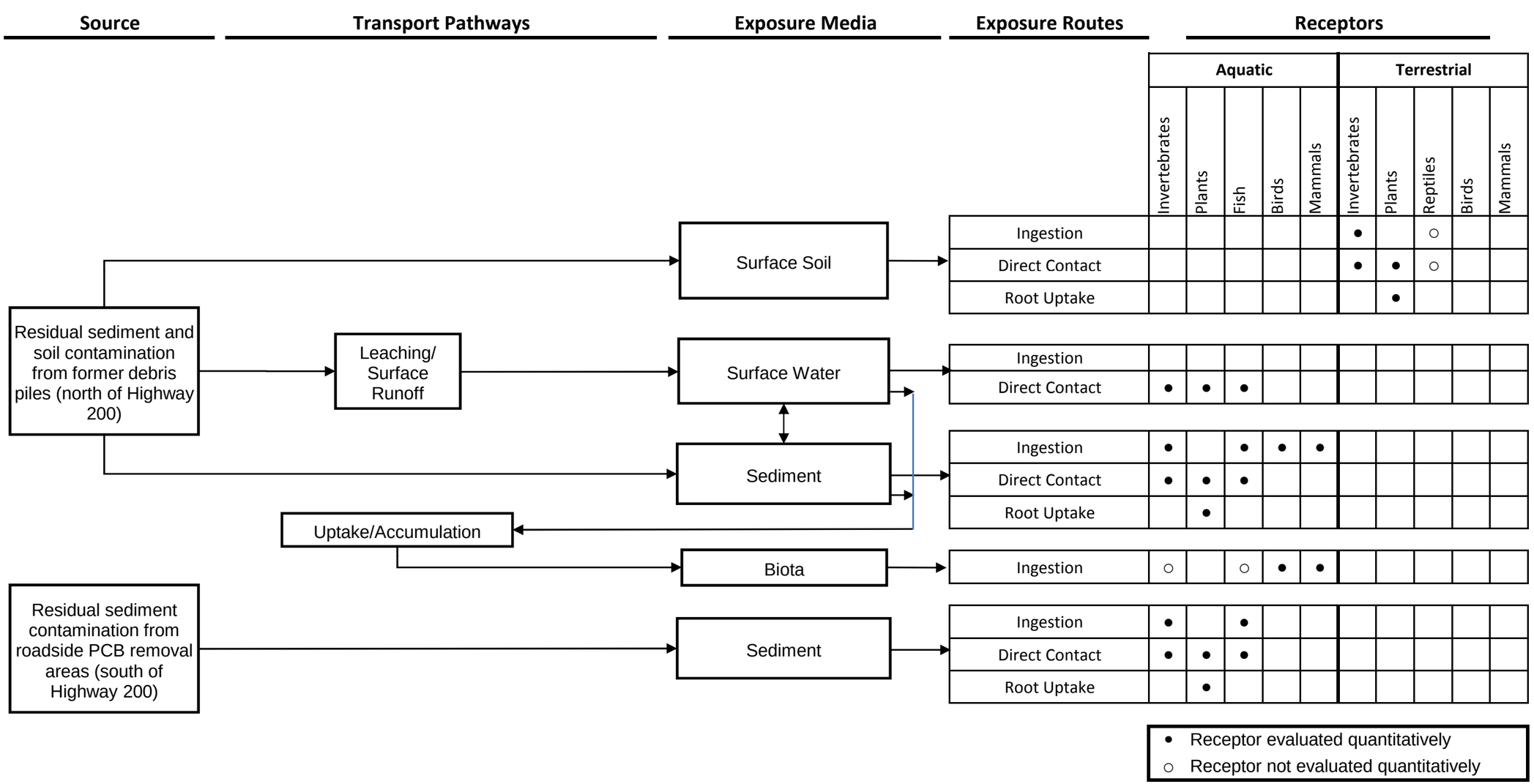


Figure F-4
Ecological Conceptual Site Model
SWMU 6, Vieques, Puerto Rico

Attachment A
Sampling Data Used for ERA

Table A-1-1
Analytical Data - SWMU 6 Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SW001	VWW06-SW002	VWW06-SW003	VWW06-SW004	VWW06-SW005	VWW06-SW006	VWW06-SW007	
	VWW06-SW001-0211	VWW06-SW002-0211	VWW06-SW003-0211	VWW06-SW004-0211	VWW06-SW005-0211	VWW06-SW006-0211	VWW06-SW007-0211	VWW06-SW007P-0211
Chemical	02/07/11	02/07/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
1,1,2,2-Tetrachloroethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
1,1,2-Trichloroethane	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
1,2,3-Trichlorobenzene	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2,4-Trichlorobenzene	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dibromo-3-chloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromoethane	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,2-Dichloropropane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,3-Dichlorobenzene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,4-Dichlorobenzene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Butanone	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
2-Hexanone	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
4-Methyl-2-pentanone	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Acetone	2.6 U	2.6 U	2.6 U	2.8 U	2.6 U	3.6 U	2.6 U	2.6 U
Benzene	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Bromochloromethane	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Bromodichloromethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromoform	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Bromomethane	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U
Carbon disulfide	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Carbon tetrachloride	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Chlorobenzene	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloromethane	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
cis-1,2-Dichloroethene	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
cis-1,3-Dichloropropene	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Cyclohexane	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Dibromochloromethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Dichlorodifluoromethane (Freon-12)	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Ethylbenzene	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Isopropylbenzene	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Methyl acetate	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Methylcyclohexane	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Methylene chloride	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Methyl-tert-butyl ether (MTBE)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Tetrachloroethene	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
Toluene	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Trichloroethene	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Trichlorofluoromethane (Freon-11)	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Vinyl chloride	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Xylene, total	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Semivolatile Organic Compounds (UG/L)								
1-Methylnaphthalene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
2-Methylnaphthalene	0.042 U	0.023 J	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Acenaphthene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Acenaphthylene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Anthracene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(a)anthracene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(a)pyrene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(b)fluoranthene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Benzo(g,h,i)perylene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U

Table A-1-1
Analytical Data - SWMU 6 Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SW001	VWW06-SW002	VWW06-SW003	VWW06-SW004	VWW06-SW005	VWW06-SW006	VWW06-SW007	
	VWW06-SW001-0211	VWW06-SW002-0211	VWW06-SW003-0211	VWW06-SW004-0211	VWW06-SW005-0211	VWW06-SW006-0211	VWW06-SW007-0211	VWW06-SW007P-0211
Chemical	02/07/11	02/07/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11
Benzo(k)fluoranthene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Chrysene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Dibenz(a,h)anthracene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Fluoranthene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Fluorene	0.042 U	0.042 U	0.041 U	0.041 U	0.043 J	0.047 J	0.055 J	0.041 UJ
Indeno(1,2,3-cd)pyrene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Naphthalene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Phenanthrene	0.042 U	0.023 J	0.051 U	0.059 U	0.064	0.069	0.079 J	0.047 UJ
Pyrene	0.042 U	0.042 U	0.041 U	0.041 U	0.041 U	0.042 U	0.041 U	0.041 U
Pesticide/Polychlorinated Biphenyls (UG/L)								
4,4'-DDD	0.0054 U	0.0053 U	0.0054 U	0.0054 U	0.0053 U	0.0054 U	0.0054 U	0.0054 U
4,4'-DDE	0.0079 U	0.0078 U	0.0079 U	0.0078 U	0.0078 U	0.0079 U	0.0078 U	0.0079 U
4,4'-DDT	0.0023 U	0.0022 U	0.0023 U	0.0023 U	0.0022 U	0.0023 U	0.0023 U	0.0023 U
Aldrin	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
alpha-BHC	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
alpha-Chlordane	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Aroclor-1016	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1221	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1232	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
Aroclor-1242	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1248	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Aroclor-1254	0.0099 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.01 U	0.0099 U	0.0099 U
Aroclor-1260	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U
beta-BHC	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
delta-BHC	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Dieldrin	0.0056 U	0.0055 U	0.0056 U	0.0056 U	0.0055 U	0.0056 U	0.0056 U	0.0056 U
Endosulfan I	0.0089 U	0.0088 U	0.0089 U	0.0089 U	0.0088 U	0.0089 U	0.0089 U	0.009 U
Endosulfan II	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
Endosulfan sulfate	0.0021 U	0.002 U	0.0021 U	0.0021 U	0.002 U	0.0021 U	0.0021 U	0.0021 U
Endrin	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0038 U
Endrin aldehyde	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U
Endrin ketone	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
gamma-BHC (Lindane)	0.005 U	0.0049 U	0.005 U	0.0049 U	0.0049 U	0.005 U	0.0049 U	0.005 U
gamma-Chlordane	0.005 U	0.0049 U	0.005 U	0.0049 U	0.0049 U	0.005 U	0.0049 U	0.005 U
Heptachlor	0.0082 U	0.0081 U	0.0082 U	0.0082 U	0.0081 U	0.0082 U	0.0082 U	0.0082 U
Heptachlor epoxide	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U
Methoxychlor	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0038 U
Toxaphene	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U
Inorganics (UG/L)								
Aluminum	316 J	446 J	1,630 R	875 R	698 R	559 R	372 R	372 R
Antimony	20 U	66 U	10.3 J	100 U	20 U	100 U	100 U	100 U
Arsenic	66.2 U	66.2 U	25 U	132 U	132 U	132 U	132 U	132 U
Barium	8.09 J	9.36 J	7.06 J	16.1 J	13.7 J	7.67 J	5.74 J	5.42 J
Beryllium	2.4 U	2.4 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
Cadmium	9.86 J	11 J	10 U	15.9 J	20 U	28.8 U	28.8 U	28.8 U
Calcium	393,000	392,000	419,000 J	523,000 J	489,000 J	498,000 J	462,000 J	464,000 J
Chromium	8.6 U	8.6 U	17.2 U	17.2 U	17.2 U	17.2 U	17.2 U	17.2 U
Cobalt	7.4 U	7.4 U	10 U	14.8 U	14.8 U	14.8 U	14.8 U	14.8 U
Copper	104 J	98.9 J	25 U	108 U	108 U	108 U	108 U	108 U
Iron	110 U	118 J	392 J	813 J	590 J	220 U	220 U	220 U
Lead	20 U	39.4 J	10 U	20 U	20 U	20 U	20 U	20 U
Magnesium	1,200,000	1,220,000	1,310,000 J	1,360,000 J	1,180,000 J	1,360,000 J	1,260,000 J	1,160,000 J
Manganese	7 U	7 U	14 U	14 U	14 U	14 U	14 U	14 U
Mercury	0.0401 J	0.074 UJ	0.0411 J	0.074 UJ	0.074 UJ	0.074 UJ	0.074 UJ	0.074 UJ
Nickel	18.6 U	18.6 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U
Potassium	417,000	415,000	433,000	544,000	510,000	512,000	476,000	480,000
Selenium	70.1 J	74.2 J	164 UJ	164 UJ	164 UJ	164 UJ	164 UJ	164 UJ
Silver	10.4 U	10.4 U	2.5 U	20.8 U	5 U	20.8 U	20.8 U	20.8 U
Sodium	10,500,000	10,500,000	11,100,000	15,900,000	11,500,000	11,300,000	10,600,000	10,800,000
Thallium	88 U	88 U	121 J	176 U	176 U	176 U	176 U	176 U
Vanadium	5.3 J	8.8 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U

Table A-1-1
Analytical Data - SWMU 6 Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SW001	VWW06-SW002	VWW06-SW003	VWW06-SW004	VWW06-SW005	VWW06-SW006	VWW06-SW007	
	VWW06-SW001-0211	VWW06-SW002-0211	VWW06-SW003-0211	VWW06-SW004-0211	VWW06-SW005-0211	VWW06-SW006-0211	VWW06-SW007-0211	VWW06-SW007P-0211
Chemical	02/07/11	02/07/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11	02/03/11
Zinc	80 U	80 U	160 U	160 U	160 U	160 U	160 U	160 U
Dissolved Metals (UG/L)								
Aluminum	NA	186 U	1,220 J	1,740 J	387 J	1,450 J	1,230 R	372 R
Antimony	66 U	66 U	10 U	100 U	20 U	100 U	100 U	100 U
Arsenic	66.2 U	66.2 U	132 U	132 U	132 U	132 U	132 U	132 U
Barium	6.83 J	7.36 J	7.58 J	19.6 J	15.5 J	8.79 J	6.48 J	5.92 J
Beryllium	2.4 U	2.4 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
Cadmium	14.4 U	14.4 U	10 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U
Calcium	400,000	400,000	418,000	419,000	484,000	416,000	409,000	465,000
Chromium	8.6 U	8.6 U	17.2 U	17.2 U	17.2 U	17.2 U	17.2 U	17.2 U
Cobalt	7.4 U	7.4 U	14.8 U	14.8 U	14.8 U	14.8 U	14.8 U	14.8 U
Copper	54 U	54 U	108 U	108 U	108 U	108 U	108 U	108 U
Iron	318 J	110 U	220 U	293 J	220 U	220 U	220 U	220 U
Lead	20 U	20 U	10 U	20 U	20 U	20 U	20 U	20 U
Magnesium	1,270,000 J	1,260,000 J	1,320,000	1,280,000	1,080,000	1,290,000	1,290,000	1,200,000
Manganese	7 U	7 U	14 U	14 U	14 U	14 U	14 U	14 U
Mercury	0.0434 J	0.0475 J	0.074 UJ	0.0439 J	0.0474 J	0.074 UJ	0.074 UJ	0.074 UJ
Nickel	18.6 U	18.6 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U
Potassium	408,000	409,000	438,000	436,000	498,000	435,000	428,000	470,000
Selenium	82 U	50.5 J	164 U	164 U	164 U	164 U	164 U	164 U
Silver	10.4 U	10.4 U	2.5 U	20.8 U	20.8 U	20.8 U	20.8 U	20.8 U
Sodium	10,400,000	10,300,000	11,000,000 J	10,800,000 J	11,000,000 J	10,700,000 J	10,900,000 J	10,700,000 J
Thallium	88 U	88 U	176 U	176 U	176 U	176 U	176 U	176 U
Vanadium	4.67 J	8.8 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U
Zinc	80 U	80 U	160 U	160 U	160 U	160 U	160 U	160 U
Other Parameters (MG/L)								
Chromium (hexavalent)	0.007 U	0.007 UJ	0.035 J	0.021 J	0.041 J	0.012 J	0.012 J	0.022 J
Dissolved Other Parameters (MG/L)								
Chromium (hexavalent)	0.007 UJ	0.007 UJ	0.012 J	0.013 J	0.014 J	0.013 J	0.009 J	0.008 J

Notes:
Shading indicates detections
NA - Not analyzed
J - Analyte present, value may or may not be accurate or precise
NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity
R - Unreliable Result
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
MG/L - Milligrams per liter
UG/L - Micrograms per liter

Table A-1-2
Analytical Data - SWMU 6 Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010
	VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211
Chemical	02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11
Volatile Organic Compounds (UG/KG)											
1,1,1-Trichloroethane	2.4 UJ	2.4 UJ	1.4 UJ	1 UJ	0.97 U	1.2 UJ	1 U	1.4 UJ	0.67 U	2.2 UJ	0.91 U
1,1,2,2-Tetrachloroethane	4.4 UJ	4.4 UJ	2.5 UJ	1.8 UJ	1.8 U	2.2 UJ	1.9 U	2.6 UJ	1.2 U	4.1 UJ	1.7 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	4.8 UJ	4.8 UJ	2.7 UJ	2 UJ	1.9 U	2.4 UJ	2.1 U	2.8 UJ	1.3 U	4.4 UJ	1.8 U
1,1,2-Trichloroethane	6.2 UJ	6.2 UJ	3.5 UJ	2.6 UJ	2.5 U	3.1 UJ	2.7 U	3.6 UJ	1.7 U	5.7 UJ	2.3 U
1,1-Dichloroethane	2.6 UJ	2.6 UJ	1.4 UJ	1.1 UJ	1 U	1.3 UJ	1.1 U	1.5 UJ	0.71 U	2.4 UJ	0.96 U
1,1-Dichloroethene	2.6 UJ	2.6 UJ	1.4 UJ	1.1 UJ	1 U	1.3 UJ	1.1 U	1.5 UJ	0.71 U	2.4 UJ	0.96 U
1,2,3-Trichlorobenzene	4.6 UJ	4.6 UJ	2.6 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.3 U	4.3 UJ	1.7 U
1,2,4-Trichlorobenzene	4.8 UJ	4.8 UJ	2.7 UJ	2 UJ	1.9 U	2.4 UJ	2.1 U	2.8 UJ	1.3 U	4.4 UJ	1.8 U
1,2-Dibromo-3-chloropropane	18.9 UJ	18.9 UJ	10.6 UJ	7.8 UJ	7.6 U	9.5 UJ	8.2 U	11.1 UJ	5.2 U	17.5 UJ	7.1 U
1,2-Dibromoethane	6.2 UJ	6.2 UJ	3.5 UJ	2.6 UJ	2.5 U	3.1 UJ	2.7 U	3.6 UJ	1.7 U	5.7 UJ	2.3 U
1,2-Dichlorobenzene	4.2 UJ	4.2 UJ	2.4 UJ	1.8 UJ	1.7 U	2.1 UJ	1.8 U	2.5 UJ	1.2 U	3.9 UJ	1.6 U
1,2-Dichloroethane	7.6 UJ	7.5 UJ	4.2 UJ	3.1 UJ	3 U	3.8 UJ	3.3 U	4.4 UJ	2.1 U	7 UJ	2.8 U
1,2-Dichloropropane	4.8 UJ	4.8 UJ	2.7 UJ	2 UJ	1.9 U	2.4 UJ	2.1 U	2.8 UJ	1.3 U	4.4 UJ	1.8 U
1,3-Dichlorobenzene	3.4 UJ	3.4 UJ	1.9 UJ	1.4 UJ	1.4 U	1.7 UJ	1.5 U	2 UJ	0.94 U	3.2 UJ	1.3 U
1,4-Dichlorobenzene	4.9 UJ	4.9 UJ	2.8 UJ	2 UJ	2 U	2.5 UJ	2.1 U	2.9 UJ	1.4 U	4.6 UJ	1.8 U
2-Butanone	30.5 J	28.5 J	23.9 J	4.4 UJ	19.5	13.4 J	7.2 J	5.6 J	2.9 U	47.3 J	13.9 J
2-Hexanone	9.8 UJ	9.8 UJ	5.5 UJ	4.1 UJ	3.9 U	4.9 UJ	4.3 U	5.8 UJ	2.7 U	9.1 UJ	3.7 U
4-Methyl-2-pentanone	12.1 UJ	12.1 UJ	6.8 UJ	5 UJ	4.8 U	6.1 UJ	5.3 U	7.1 UJ	3.3 U	11.2 UJ	4.5 U
Acetone	207 J	104 J	80.7 J	29.6 J	86.9	49.8 J	4.3 UJ	112 J	2.7 U	158 J	70
Benzene	3.8 UJ	3.8 UJ	2.1 UJ	1.6 UJ	1.5 U	1.9 UJ	1.6 U	2.2 UJ	1 U	3.5 UJ	1.4 U
Bromochloromethane	6.8 UJ	6.8 UJ	3.8 UJ	2.8 UJ	2.7 U	3.4 UJ	3 U	4 UJ	1.9 U	6.3 UJ	2.6 U
Bromodichloromethane	2.4 UJ	2.4 UJ	1.4 UJ	1 UJ	0.97 U	1.2 UJ	1 U	1.4 UJ	0.67 U	2.2 UJ	0.91 U
Bromoform	3.5 UJ	3.5 UJ	1.9 UJ	1.4 UJ	1.4 U	1.7 UJ	1.5 U	2 UJ	0.96 U	3.2 UJ	1.3 U
Bromomethane	7.6 UJ	7.5 UJ	4.2 UJ	3.1 UJ	3 U	3.8 UJ	3.3 U	4.4 UJ	2.1 U	7 UJ	2.8 U
Carbon disulfide	17 J	9.5 J	4 J	3.1 UJ	3 U	3.4 J	3.3 U	4.4 UJ	2.1 U	13 J	2.8 U
Carbon tetrachloride	4.5 UJ	4.5 UJ	2.5 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.2 U	4.2 UJ	1.7 U
Chlorobenzene	2.6 UJ	2.6 UJ	1.5 UJ	1.1 UJ	1.1 U	1.3 UJ	1.2 U	1.6 UJ	0.73 U	2.4 UJ	0.99 U
Chloroethane	5.6 UJ	5.6 UJ	3.1 UJ	2.3 UJ	2.2 U	2.8 UJ	2.4 U	3.3 UJ	1.5 U	5.2 UJ	2.1 U
Chloroform	4.1 UJ	4.1 UJ	2.3 UJ	1.7 UJ	1.6 U	2 UJ	1.8 U	2.4 UJ	1.1 U	3.8 UJ	1.5 U
Chloromethane	2.9 UJ	2.9 UJ	1.6 UJ	1.2 UJ	1.2 U	1.4 UJ	1.2 U	1.7 UJ	0.79 U	2.7 UJ	1.1 U
cis-1,2-Dichloroethene	4.7 UJ	4.7 UJ	2.6 UJ	1.9 UJ	1.9 U	2.4 UJ	2 U	2.7 UJ	1.3 U	4.3 UJ	1.8 U
cis-1,3-Dichloropropene	3.2 UJ	3.2 UJ	1.8 UJ	1.3 UJ	1.3 U	1.6 UJ	1.4 U	1.9 UJ	0.88 U	2.9 UJ	1.2 U
Cyclohexane	7.6 UJ	7.5 UJ	4.2 UJ	3.1 UJ	3 U	3.8 UJ	3.3 U	4.4 UJ	2.1 U	7 UJ	2.8 U
Dibromochloromethane	3.5 UJ	3.5 UJ	1.9 UJ	1.4 UJ	1.4 U	1.7 UJ	1.5 U	2 UJ	0.96 U	3.2 UJ	1.3 U
Dichlorodifluoromethane (Freon-12)	4.5 UJ	4.5 UJ	2.5 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.2 U	4.2 UJ	1.7 U
Ethylbenzene	5.2 UJ	5.2 UJ	2.9 UJ	2.2 UJ	2.1 U	2.6 UJ	2.3 U	3 UJ	1.4 U	4.8 UJ	2 U
Isopropylbenzene	4.5 UJ	4.5 UJ	2.5 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.2 U	4.2 UJ	1.7 U
Methyl acetate	15.1 UJ	15.1 UJ	8.5 UJ	6.3 UJ	6.1 U	7.6 UJ	6.6 U	8.9 UJ	4.2 U	14 UJ	5.7 U
Methylcyclohexane	3.2 UJ	3.2 UJ	1.8 UJ	1.4 UJ	1.3 U	1.6 UJ	1.4 U	1.9 UJ	0.9 U	3 UJ	1.2 U
Methylene chloride	9.1 UJ	9 UJ	5.1 UJ	3.8 UJ	3.6 U	4.6 UJ	4 U	5.3 UJ	2.5 U	8.4 UJ	3.4 U
Methyl-tert-butyl ether (MTBE)	3.2 UJ	3.2 UJ	1.8 UJ	1.4 UJ	1.3 U	1.6 UJ	1.4 U	1.9 UJ	0.9 U	3 UJ	1.2 U
Styrene	2.1 UJ	2.1 UJ	1.2 UJ	0.88 UJ	0.85 U	1.1 UJ	0.92 U	1.2 UJ	0.58 U	2 UJ	0.79 U
Tetrachloroethene	12 J	10.3 J	2.8 J	2.2 J	1.8 J	2.4 J	3.1 U	4.1 UJ	2 J	6.5 UJ	1.6 J
Toluene	2.2 UJ	2.2 UJ	1.2 UJ	0.91 UJ	0.88 U	1.1 UJ	0.96 U	1.3 UJ	0.6 U	2 UJ	0.82 U
trans-1,2-Dichloroethene	2.9 UJ	2.9 UJ	1.6 UJ	1.2 UJ	1.2 U	1.5 UJ	1.3 U	1.7 UJ	0.81 U	2.7 UJ	1.1 U
trans-1,3-Dichloropropene	7.6 UJ	7.5 UJ	4.2 UJ	3.1 UJ	3 U	3.8 UJ	3.3 U	4.4 UJ	2.1 U	7 UJ	2.8 U
Trichloroethene	3.3 UJ	3.3 UJ	1.9 UJ	1.4 UJ	1.3 U	1.7 UJ	1.4 U	2 UJ	0.92 U	3.1 UJ	1.2 U
Trichlorofluoromethane (Freon-11)	3.3 UJ	3.3 UJ	1.9 UJ	1.4 UJ	1.3 U	1.7 UJ	1.4 U	2 UJ	0.92 U	3.1 UJ	1.2 U
Vinyl chloride	4.5 UJ	4.5 UJ	2.5 UJ	1.9 UJ	1.8 U	2.3 UJ	2 U	2.7 UJ	1.2 U	4.2 UJ	1.7 U
Xylene, total	5.1 UJ	5.1 UJ	2.9 UJ	2.1 UJ	2.1 U	2.6 UJ	2.2 U	3 UJ	1.4 U	4.8 UJ	1.9 U
Semivolatile Organic Compounds (UG/KG)											
1-Methylnaphthalene	9 UJ	66.8 UJ	20.4 UJ	19.6 UJ	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
2,2'-Oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A-1-2
Analytical Data - SWMU 6 Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010
	VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211
Chemical	02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	9 UJ	66.8 UJ	20.4 U	19.6 U	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	9 UJ	66.8 UJ	20.4 U	11.9 J	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Acenaphthylene	9 UJ	66.8 UJ	20.4 U	19.6 U	17 UJ	18 UJ	20 J	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Anthracene	9.9 J	66.8 UJ	20.4 U	28.2	17 UJ	9.4 J	18.8 J	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Benzo(a)anthracene	10.1 J	70.3 UJ	39.7	66.7	22.6 J	59.9 J	102 J	4.7 J	2.7 UJ	63.2 J	20.2 J
Benzo(a)pyrene	11.2 UJ	83.6 UJ	77.8 J	65.1	24.5 J	62.5 J	110 J	6.7 J	3.3 UJ	96.7 J	25.2 J
Benzo(b)fluoranthene	11.2 UJ	83.6 UJ	124 J	87.4	40.5 J	96.1 J	160 J	10.7 J	3.3 UJ	155 J	36.1 J
Benzo(g,h,i)perylene	11.2 UJ	83.6 UJ	60 J	38.8	21.3 UJ	32.1 J	62.2 J	5.1 UJ	3.3 UJ	58.8 J	21.3 UJ
Benzo(k)fluoranthene	11.2 UJ	83.6 UJ	39.8 J	31.5	16.2 J	37.8 J	63.4 J	4.2 J	3.3 UJ	59.7 J	15.1 J
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	6.2 J	65.3 UJ	49.5	63.1	21.1 J	54.1 J	92.4 J	6.8 J	2.5 UJ	86.3 J	18.2 J
Dibenz(a,h)anthracene	11.2 UJ	83.6 UJ	25.6 U	24.5 U	21.3 UJ	22.5 UJ	45.6 UJ	5.1 UJ	3.3 UJ	41.5 UJ	21.3 UJ
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	14.8 J	66.8 UJ	49 J	91.7	29.5 J	72.9 J	122 J	8.5 J	2.6 UJ	92.6 J	25.2 J
Fluorene	9 UJ	66.8 UJ	20.4 U	11.6 J	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	11.2 UJ	83.6 UJ	50.5 J	34.9	21.3 UJ	33.7 J	61.4 J	5.1 UJ	3.3 UJ	55.5 J	21.3 UJ
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	9 UJ	66.8 UJ	20.4 U	19.6 U	17 UJ	18 UJ	36.4 UJ	4.1 UJ	2.6 UJ	33.1 UJ	17 UJ
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAH (HMW)	59.9	352 U	522	525	189	451	780	48.1	13.8 U	704	180
PAH (LMW)	51.8	267 U	137	284	89.6	137	252	22.9	10.4 U	218	84.9
PAH (total)	112	619 U	659	809	278	588	1,032	70.9	24.2 U	922	264
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	4.6 J	66.8 UJ	27	111	9.1 J	9.8 J	36.4 UJ	4.1 UJ	2.6 UJ	26 J	8.7 J
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	10 J	66.8 UJ	67.4	125	31.9 J	63.6 J	106 J	7.3 J	2.6 UJ	108 J	32.8 J
Pesticide/Polychlorinated Biphenyls (UG/KG)											
4,4'-DDD	2.6 UJ	1.5 J	59 J	14 J	4.6 J	2.7 UJ	2.8 J	3.2 UJ	1 UJ	34 J	5.4 J
4,4'-DDE	1.4 UJ	1.1 J	94 J	28 J	9.7 J	2.9 J	5.9 J	1.7 UJ	0.54 UJ	66 J	7.5 J
4,4'-DDT	2 UJ	1.5 UJ	3.2 J	2.3 U	2 UJ	2 UJ	2.1 UJ	2.4 UJ	0.76 UJ	3.7 UJ	2 UJ

Table A-1-2
Analytical Data - SWMU 6 Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010
	VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211
Chemical	02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11
Aldrin	0.77 UJ	0.58 UJ	0.92 UJ	0.9 U	0.77 UJ	0.8 UJ	0.84 UJ	0.93 UJ	0.3 UJ	1.5 UJ	0.77 UJ
alpha-BHC	3.8 UJ	2.9 UJ	4.6 U	4.5 U	3.9 UJ	4 UJ	4.2 UJ	4.7 UJ	1.5 UJ	7.4 UJ	3.9 UJ
alpha-Chlordane	0.82 UJ	0.62 UJ	0.98 UJ	0.96 U	0.82 UJ	0.85 UJ	0.89 UJ	0.99 UJ	0.32 UJ	1.6 UJ	0.82 UJ
Aroclor-1016	67 UJ	50 UJ	40 U	39 U	34 UJ	35 UJ	36 UJ	40 UJ	26 UJ	64 UJ	33 UJ
Aroclor-1221	62 UJ	46 UJ	37 U	36 U	31 UJ	32 UJ	33 UJ	37 UJ	24 UJ	59 UJ	31 UJ
Aroclor-1232	77 UJ	58 UJ	46 U	45 U	39 UJ	40 UJ	42 UJ	47 UJ	30 UJ	74 UJ	39 UJ
Aroclor-1242	56 UJ	42 UJ	34 U	33 U	28 UJ	29 UJ	31 UJ	34 UJ	22 UJ	54 UJ	28 UJ
Aroclor-1248	56 UJ	42 UJ	34 U	33 U	28 UJ	29 UJ	31 UJ	34 UJ	22 UJ	54 UJ	28 UJ
Aroclor-1254	49 UJ	37 UJ	29 U	160	32 J	25 UJ	30 J	30 UJ	19 UJ	260 J	48 J
Aroclor-1260	31 UJ	24 UJ	19 U	18 U	16 UJ	16 UJ	17 UJ	19 UJ	12 UJ	30 UJ	16 UJ
Polychlorinated biphenyls (PCBs)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	0.77 UJ	0.58 UJ	0.92 U	0.9 U	0.77 UJ	0.8 UJ	0.84 UJ	0.93 UJ	0.3 UJ	1.5 UJ	0.77 UJ
delta-BHC	1.4 UJ	1.1 UJ	1.7 UJ	1.7 U	1.4 UJ	1.5 UJ	1.6 UJ	1.7 UJ	0.56 UJ	2.8 UJ	1.4 UJ
Dieldrin	0.82 UJ	0.62 UJ	0.98 U	0.96 U	0.82 UJ	0.85 UJ	0.89 UJ	0.99 UJ	0.32 UJ	1.6 UJ	0.82 UJ
Endosulfan I	1.1 UJ	0.85 UJ	1.4 U	1.3 U	1.1 UJ	1.2 UJ	1.2 UJ	1.4 UJ	0.44 UJ	2.2 UJ	1.1 UJ
Endosulfan II	1.5 UJ	1.1 UJ	1.8 U	1.7 U	1.5 UJ	1.5 UJ	1.6 UJ	1.8 UJ	0.58 UJ	2.8 UJ	1.5 UJ
Endosulfan sulfate	1 UJ	0.77 UJ	1.2 U	1.2 U	1 UJ	1.1 UJ	1.1 UJ	1.2 UJ	0.4 UJ	2 UJ	1 UJ
Endrin	1.3 UJ	1 UJ	1.6 U	1.6 U	1.3 UJ	1.4 UJ	1.4 UJ	1.6 UJ	0.52 UJ	2.6 UJ	1.3 UJ
Endrin aldehyde	1.8 UJ	1.4 UJ	2.2 U	2.1 U	1.8 UJ	1.9 UJ	2 UJ	2.2 UJ	0.72 UJ	3.5 UJ	1.8 UJ
Endrin ketone	1.1 UJ	0.81 UJ	1.3 U	1.2 U	1.1 UJ	1.1 UJ	1.2 UJ	1.3 UJ	0.42 UJ	2.1 UJ	1.1 UJ
gamma-BHC (Lindane)	1 UJ	0.77 UJ	1.2 U	1.2 U	1 UJ	1.1 UJ	1.1 UJ	1.2 UJ	0.4 UJ	2 UJ	1 UJ
gamma-Chlordane	0.87 UJ	0.66 UJ	1 U	1 U	0.88 UJ	0.91 UJ	0.95 UJ	1 UJ	0.34 UJ	1.7 UJ	0.88 UJ
Heptachlor	1 UJ	0.77 UJ	1.2 U	1.2 U	1 UJ	1.1 UJ	1.1 UJ	1.2 UJ	0.4 UJ	2 UJ	1 UJ
Heptachlor epoxide	0.77 UJ	0.58 UJ	0.92 UJ	0.9 U	0.77 UJ	0.8 UJ	0.84 UJ	0.93 UJ	0.3 UJ	1.5 UJ	0.77 UJ
Methoxychlor	1.4 UJ	1 UJ	1.7 U	1.6 U	1.4 UJ	1.4 UJ	1.5 UJ	1.7 UJ	0.54 UJ	2.7 UJ	1.4 UJ
Toxaphene	130 UJ	96 UJ	150 U	150 U	130 UJ	130 UJ	140 UJ	160 UJ	50 UJ	250 UJ	130 UJ
Explosives (UG/KG)											
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (MG/KG)											
Aluminum	14,500 J	12,600 J	8,980 J	7,820 J	10,700 J	7,030 J	5,720 J	5,460 J	2,120 J	14,400 J	6,030 J
Antimony	1.1 UJ	0.924 UJ	3.19 J	1.12 J	0.631 UJ	3.88 J	3.04 J	0.717 UJ	0.456 UJ	2.2 J	0.396 J
Arsenic	4 J	5.8 J	3.9	2.4	2.2 J	4 J	4.8 J	1.2 J	1.2 J	7.8 J	4.4 J
Barium	12.2 J	10.7 J	25.8	15.1	18.5 J	13.3 J	9.73 J	7.39 J	10.3 J	33.8 J	14.8 J
Beryllium	0.733 UJ	0.337 J	3.27 U	3.16 U	2.76 UJ	2.88 UJ	3.23 UJ	3.55 UJ	2.85 UJ	5.01 UJ	2.73 UJ
Cadmium	0.302 J	0.192 UJ	1.98 J	1.75 J	4.14 J	1.65 J	1 J	0.903 J	0.775 J	5.69 J	1.62 J
Calcium	101,000 J	48,000 J	114,000	94,400	87,100 J	140,000 J	106,000 J	93,800 J	105,000 J	72,900 J	110,000 J
Chromium	13.6 J	13.8 J	16.7	12.2	12.5 J	14.3 J	14.2 J	5.9 J	3.3 J	37 J	19.3 J
Cobalt	4.95 J	5.82 J	5.14	4.13 J	7.89 J	3.1 J	3.12 J	1.77 J	0.925 J	9 J	3.81 J
Copper	27.5 J	37.4 J	138 J	73.4 J	71.5 J	54.1 J	46.7 J	13.6 J	5.08 J	204 J	56.9 J
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	17,400 J	21,400 J	26,700	18,800	26,400 J	17,100 J	16,500 J	6,750 J	3,310 J	45,900 J	18,600 J
Lead	6.7 J	25.8 J	442	185	157 J	93 J	79.3 J	11.8 J	6.8 J	612 J	134 J
Magnesium	10,900 J	9,290 J	6,430 J	5,390 J	7,660 J	7,720 J	4,390 J	3,580 J	3,110 J	11,900 J	4,100 J
Manganese	187 J	219 J	294	245	266 J	123 J	116 J	60.1 J	89.4 J	356 J	164 J
Mercury	0.039 J	0.104 J	0.088	0.0642	0.0446 J	0.0288 J	0.0336 J	0.0205 J	0.00742 J	0.129 J	0.0554 J
Nickel	5.94 J	6.92 J	10.2 J	6.41 J	11.4 J	8.36 J	5.54 J	3.55 UJ	2.85 UJ	19.1 J	6.66 J
Potassium	3,910 J	3,320 J	1,760	1,700	1,940 J	1,360 J	1,210 J	1,380 J	699 J	3,450 J	1,170 J
Selenium	1.5 UJ	1.5 UJ	0.93 U	0.92 U	0.61 UJ	0.62 UJ	0.63 UJ	0.84 UJ	0.47 UJ	1.4 UJ	0.57 UJ
Silver	0.733 UJ	0.616 UJ	0.295 J	0.246 J	0.42 UJ	0.406 UJ	0.492 UJ	0.478 UJ	0.304 UJ	0.787 UJ	0.368 UJ

Table A-1-2
Analytical Data - SWMU 6 Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010
	VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211
Chemical	02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11
Sodium	44,900 J	32,900 J	12,600 J	12,600 J	9,270 J	10,300 J	9,700 J	12,400 J	10,900 J	27,800 J	8,010 J
Thallium	1.56 UJ	1.32 J	6.96 U	6.72 U	5.17 J	6.13 UJ	6.86 UJ	7.55 UJ	6.05 UJ	10.6 UJ	5.8 UJ
Vanadium	40.8 J	43 J	38.6	32.6	59.7 J	26.7 J	21.5 J	17.6 J	9.58 J	66.1 J	29.8 J
Zinc	39.6 J	64.7 J	440	262	237 J	206 J	162 J	25.4 J	11 J	849 J	164 J
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)											
Zinc, SEM	0.31	0.48	3.8	1.4	2	1.6	NA	3.1	0.16	0.35	5.1
Acid volatile sulfide	8.9	7.4	0.17	0.53	0.15	0.38	NA	3.2	1.8	0.029 U	2.7
Cadmium, SEM	0.005 U	7.40E-04 J	0.0072	0.0039	0.016	0.0028	NA	0.0043	0.0014 U	0.0035 U	0.024
Copper, SEM	0.051 U	0.036 U	0.32	0.17	0.32	0.11	NA	0.12	0.013 J	0.092	0.22
Lead, SEM	0.026	0.081	1.3	0.43	0.54	0.24	NA	0.34	0.02	0.067	1.3
Mercury, SEM	1.10E-04 U	7.50E-05 U	1.40E-05 J	4.60E-05 U	4.10E-05 U	3.90E-05 U	NA	4.80E-05 U	3.00E-05 U	7.60E-05 U	4.00E-05 U
Nickel, SEM	0.013 J	0.012 J	0.044	0.022 J	0.032 J	0.023 J	NA	0.024 J	0.0029 J	0.0097 J	0.048
Silver, SEM	0.03 U	0.021 U	0.013 U	0.013 U	0.011 U	0.011 U	NA	0.014 U	0.0084 U	0.022 U	0.011 U
Other Parameters											
Ammonia (MG/KG)	351	167	60.6	62.5	53.1	41.5	NA	60.3	27.2	141	40.4
Chromium (hexavalent) (UG/KG)	38,600 J	36,900 J	5,280	891 U	836 UJ	988 J	2,990 J	6,430 J	1,840 J	12,000 J	1,920 J
pH	7.4	7.65	7.75	7.8	7.85	7.76	NA	7.45	8.11	7.83	7.82
Sulfide (MG/KG)	140	170	99	130	160	130	NA	70	19	54	89
Total organic carbon (MG/KG)	35,000 J	45,000 J	18,000 J	16,000 J	13,000 J	16,000 J	NA	13,000 J	7,500	24,000 J	6,700
Total Petroleum Hydrocarbons (UG/KG)											
TPH-diesel range	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH-gas range	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shading indicates detections
NA - Not analyzed
J - Analyte present, value may or may not be accurate or precise
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
UG/KG - Micrograms per kilogram
UMOL/G - Micromoles per gram

Table A-1-3
Analytical Data - SWMU 6 Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD011		VWW06-SO136
	VWW06-SD011-0211	VWW06-SD011P-0211	116701-06-Z-136
Chemical	02/04/11	02/04/11	06/24/09
Volatile Organic Compounds (UG/KG)			
1,1,1-Trichloroethane	0.6 UJ	0.62 U	6.6 U
1,1,2,2-Tetrachloroethane	1.1 UJ	1.1 U	6.6 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.2 UJ	1.2 U	NA
1,1,2-Trichloroethane	1.5 UJ	1.6 U	6.6 U
1,1-Dichloroethane	0.63 UJ	0.66 U	6.6 U
1,1-Dichloroethene	0.63 UJ	0.66 U	6.6 U
1,2,3-Trichlorobenzene	1.1 UJ	1.2 U	NA
1,2,4-Trichlorobenzene	1.2 UJ	1.2 U	190 U
1,2-Dibromo-3-chloropropane	4.6 UJ	4.8 U	NA
1,2-Dibromoethane	1.5 UJ	1.6 U	NA
1,2-Dichlorobenzene	1 UJ	1.1 U	190 U
1,2-Dichloroethane	1.9 UJ	1.9 U	6.6 U
1,2-Dichloropropane	1.2 UJ	1.2 U	6.6 U
1,3-Dichlorobenzene	0.84 UJ	0.87 U	190 U
1,4-Dichlorobenzene	1.2 UJ	1.2 U	190 U
2-Butanone	2.6 UJ	2.7 U	33 U
2-Hexanone	2.4 UJ	2.5 U	33 U
4-Methyl-2-pentanone	3 UJ	3.1 U	33 U
Acetone	4.6 J	2.5 U	66 UJ
Benzene	0.93 UJ	0.96 U	6.6 U
Bromochloromethane	1.7 UJ	1.7 U	NA
Bromodichloromethane	0.6 UJ	0.62 U	6.6 U
Bromoform	0.86 UJ	0.89 U	6.6 U
Bromomethane	1.9 UJ	1.9 U	6.6 U
Carbon disulfide	1.9 UJ	1.9 U	6.6 U
Carbon tetrachloride	1.1 UJ	1.2 U	6.6 U
Chlorobenzene	0.65 UJ	0.67 U	6.6 U
Chloroethane	1.4 UJ	1.4 U	6.6 U
Chloroform	1 UJ	1 U	6.6 U
Chloromethane	0.71 UJ	0.73 U	6.6 U
cis-1,2-Dichloroethene	1.2 UJ	1.2 U	6.6 U
cis-1,3-Dichloropropene	0.78 UJ	0.81 U	6.6 U
Cyclohexane	1.9 UJ	1.9 U	NA
Dibromochloromethane	0.86 UJ	0.89 U	6.6 U
Dichlorodifluoromethane (Freon-12)	1.1 UJ	1.2 U	NA
Ethylbenzene	1.3 UJ	1.3 U	6.6 U
Isopropylbenzene	1.1 UJ	1.2 U	NA
Methyl acetate	3.7 UJ	3.8 U	NA
Methylcyclohexane	0.8 UJ	0.83 U	NA
Methylene chloride	2.2 UJ	2.3 U	13 U
Methyl-tert-butyl ether (MTBE)	0.8 UJ	0.83 U	NA
Styrene	0.52 UJ	0.54 U	6.6 U
Tetrachloroethene	1.7 UJ	2 J	6.6 UJ
Toluene	0.54 UJ	0.56 U	6.6 U
trans-1,2-Dichloroethene	0.72 UJ	0.75 U	6.6 U
trans-1,3-Dichloropropene	1.9 UJ	1.9 U	6.6 U
Trichloroethene	0.82 UJ	0.85 U	6.6 U
Trichlorofluoromethane (Freon-11)	0.82 UJ	0.85 U	NA
Vinyl chloride	1.1 UJ	1.2 U	6.6 U
Xylene, total	1.3 UJ	1.3 U	20 U
Semivolatile Organic Compounds (UG/KG)			
1-Methylnaphthalene	11.6 UJ	11.3 UJ	300 U
2,2'-Oxybis(1-chloropropane)	NA	NA	190 U
2,4,5-Trichlorophenol	NA	NA	190 U
2,4,6-Trichlorophenol	NA	NA	190 U
2,4-Dichlorophenol	NA	NA	190 U
2,4-Dimethylphenol	NA	NA	190 U
2,4-Dinitrophenol	NA	NA	930 U
2,4-Dinitrotoluene	NA	NA	160 U
2,6-Dinitrotoluene	NA	NA	160 U
2-Chloronaphthalene	NA	NA	190 U
2-Chlorophenol	NA	NA	190 U
2-Methylnaphthalene	11.6 UJ	11.3 UJ	190 U
2-Methylphenol	NA	NA	190 U
2-Nitroaniline	NA	NA	370 U
2-Nitrophenol	NA	NA	190 U
3- and 4-Methylphenol	NA	NA	190 U
3,3'-Dichlorobenzidine	NA	NA	370 U
3-Nitroaniline	NA	NA	370 U
4,6-Dinitro-2-methylphenol	NA	NA	370 U
4-Bromophenyl-phenylether	NA	NA	190 U
4-Chloro-3-methylphenol	NA	NA	190 U
4-Chloroaniline	NA	NA	190 U
4-Chlorophenyl-phenylether	NA	NA	190 U
4-Nitroaniline	NA	NA	370 U
4-Nitrophenol	NA	NA	930 U
Acenaphthene	11.6 UJ	11.3 UJ	190 U
Acenaphthylene	11.6 UJ	11.3 UJ	190 U
Anthracene	11.6 UJ	11.3 UJ	190 U
Benzo(a)anthracene	30.6 J	12.3 J	66.4
Benzo(a)pyrene	29.1 J	20.4 J	84.7
Benzo(b)fluoranthene	41.2 J	29.7 J	119 J
Benzo(g,h,i)perylene	17.2 J	13.6 J	43.2
Benzo(k)fluoranthene	15.2 J	11.7 J	45.3
Benzoic acid	NA	NA	930 U
Benzyl alcohol	NA	NA	190 U
bis(2-Chloroethoxy)methane	NA	NA	190 U
bis(2-Chloroethyl)ether	NA	NA	190 U
bis(2-Ethylhexyl)phthalate	NA	NA	370 U

Table A-1-3
Analytical Data - SWMU 6 Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD011		VWW06-SO136
	VWW06-SD011-0211	VWW06-SD011P-0211	116701-06-Z-136
Chemical	02/04/11	02/04/11	06/24/09
Butylbenzylphthalate	NA	NA	370 U
Carbazole	NA	NA	190 U
Chrysene	26.5 J	16.3 J	65.1 J
Dibenz(a,h)anthracene	14.5 UJ	14.2 UJ	30 U
Dibenzofuran	NA	NA	190 U
Diethylphthalate	NA	NA	370 U
Dimethyl phthalate	NA	NA	370 U
Di-n-butylphthalate	NA	NA	370 U
Di-n-octylphthalate	NA	NA	370 U
Fluoranthene	43.6 J	13.9 J	48.5 J
Fluorene	11.6 UJ	11.3 UJ	190 U
Hexachlorobenzene	NA	NA	190 U
Hexachlorobutadiene	NA	NA	190 U
Hexachlorocyclopentadiene	NA	NA	190 U
Hexachloroethane	NA	NA	190 U
Indeno(1,2,3-cd)pyrene	16.8 J	13.3 J	60.8
Isophorone	NA	NA	190 U
Naphthalene	11.6 UJ	11.3 UJ	190 U
n-Nitroso-di-n-propylamine	NA	NA	190 U
n-Nitrosodiphenylamine	NA	NA	190 U
Nitrobenzene	NA	NA	160 U
PAH (HMW)	223	138	540
PAH (LMW)	95.9	53.5	809
Pentachlorophenol	NA	NA	930 U
Phenanthrene	17.5 J	11.3 UJ	190 U
Phenol	NA	NA	190 U
Pyrene	38.8 J	13.4 J	40.3 J
Pesticide/Polychlorinated Biphenyls (UG/KG)			
4,4'-DDD	1.4 J	1.7 J	3.7 U
4,4'-DDE	14 J	16 J	3.7 U
4,4'-DDT	7 J	5.9 J	3.7 U
Aldrin	0.26 UJ	0.26 UJ	1.8 U
alpha-BHC	1.3 UJ	1.3 UJ	1.8 U
alpha-Chlordane	0.27 UJ	0.28 UJ	1.8 U
Aroclor-1016	22 UJ	22 UJ	18 U
Aroclor-1221	20 UJ	21 UJ	18 U
Aroclor-1232	26 UJ	26 UJ	18 U
Aroclor-1242	19 UJ	19 UJ	18 U
Aroclor-1248	19 UJ	19 UJ	18 U
Aroclor-1254	42 NJ	120 J	18 U
Aroclor-1260	10 UJ	10 UJ	18 U
Polychlorinated biphenyls (PCBs)	NA	NA	37 U
beta-BHC	0.26 UJ	0.26 UJ	1.8 U
delta-BHC	0.48 UJ	0.48 UJ	1.8 U
Dieldrin	0.27 UJ	0.28 UJ	1.8 U
Endosulfan I	0.37 UJ	0.38 UJ	1.8 U
Endosulfan II	0.49 UJ	0.5 UJ	1.8 U
Endosulfan sulfate	0.34 UJ	0.35 UJ	3.7 U
Endrin	0.44 UJ	0.45 UJ	3.7 U
Endrin aldehyde	0.61 UJ	0.62 UJ	3.7 U
Endrin ketone	0.36 UJ	0.36 UJ	3.7 U
gamma-BHC (Lindane)	0.34 UJ	0.35 UJ	1.8 U
gamma-Chlordane	0.29 UJ	0.3 UJ	1.8 U
Heptachlor	0.34 UJ	0.35 UJ	1.8 U
Heptachlor epoxide	0.26 UJ	0.26 UJ	1.8 U
Methoxychlor	0.46 UJ	0.47 UJ	3.7 U
Toxaphene	42 UJ	43 UJ	92 U
Explosives (UG/KG)			
1,3,5-Trinitrobenzene	NA	NA	160 U
1,3-Dinitrobenzene	NA	NA	160 U
2,4,6-Trinitrotoluene	NA	NA	160 U
2-Amino-4,6-dinitrotoluene	NA	NA	160 U
2-Nitrotoluene	NA	NA	160 U
3-Nitrotoluene	NA	NA	160 U
4-Amino-2,6-dinitrotoluene	NA	NA	160 U
4-Nitrotoluene	NA	NA	160 U
HMX	NA	NA	160 U
RDX	NA	NA	160 U
Tetryl	NA	NA	160 U
Inorganics (MG/KG)			
Aluminum	5,400 J	5,610 J	16,200
Antimony	0.484 UJ	0.452 UJ	1.3 J
Arsenic	1.2 J	0.96 J	0.48 J
Barium	49.8 J	48.6 J	48.9
Beryllium	2.59 UJ	2.94 UJ	0.3
Cadmium	0.5 J	0.918 UJ	0.42 U
Calcium	107,000 J	99,200 J	4,180
Chromium	6.5 J	6.6 J	24.6
Cobalt	3.4 J	4.05 J	16.5
Copper	57.6 J	72 J	51.6
Cyanide	NA	NA	0.13 U
Iron	11,200 J	11,900 J	32,200
Lead	12.1 J	12.7 J	4 J
Magnesium	5,280 J	5,380 J	11,500
Manganese	229 J	247 J	911
Mercury	0.00897 J	0.0106 J	0.093 U
Nickel	3.03 J	3.56 J	16.6
Potassium	847 J	874 J	640
Selenium	0.54 UJ	0.43 UJ	11 U
Silver	0.322 UJ	0.301 UJ	0.53 U

Table A-1-3
Analytical Data - SWMU 6 Surface Soil
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD011		VWW06-SO136
	VWW06-SD011-0211	VWW06-SD011P-0211	116701-06-Z-136
Chemical	02/04/11	02/04/11	06/24/09
Sodium	5,390 J	5,020 J	3,110
Thallium	5.5 UJ	6.24 UJ	22 U
Vanadium	32.7 J	35 J	108
Zinc	56.9 J	58 J	51.5 J
Other Parameters			
Chromium (hexavalent) (UG/KG)	1,740 J	2,380 J	NA
pH	8.05	NA	NA
Total organic carbon (MG/KG)	8,500	NA	NA
Total Petroleum Hydrocarbons (UG/KG)			
TPH-diesel range	NA	NA	37,200
TPH-gas range	NA	NA	6,200 U

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/KG - Milligrams per kilogram

PH - pH units

UG/KG - Micrograms per kilogram

Table A-1-4
Analytical Data - SWMU 6 PCB Removal Area
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SS012	VWW06-SS013	
	VWW06-SS012-0211	VWW06-SS013-0211	VWW06-SS013P-0211
Chemical	02/07/11	02/07/11	02/07/11
Pesticide/Polychlorinated Biphenyls (UG/KG)			
Aroclor-1016	19 U	22 U	22 U
Aroclor-1221	17 U	20 U	21 U
Aroclor-1232	22 U	25 U	26 U
Aroclor-1242	16 U	18 U	19 U
Aroclor-1248	16 U	18 U	19 U
Aroclor-1254	98	16 U	16 U
Aroclor-1260	8.8 U	10 U	10 U

Notes:

Shading indicates detections

NA - Not analyzed

U - The material was analyzed for, but not detected

UG/KG - Micrograms per kilogram

Table A-1-5
Analytical Data - SWMU 6 Background Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021	VWW06-SW022	VWW06-SW023	
	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Chemical	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Volatile Organic Compounds (UG/L)											
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/L)											
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A-1-5
Analytical Data - SWMU 6 Background Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021	VWW06-SW022	VWW06-SW023	
	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Chemical	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)											
4,4'-DDD	0.0054 U	0.0055 U	0.0055 U	0.0054 U	0.048 J	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U
4,4'-DDE	0.0079 U	0.008 U	0.0081 U	0.0079 U	0.067	0.0079 U	0.0078 U	0.0079 U	0.0078 U	0.0079 U	0.0079 U
4,4'-DDT	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.083	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U
Aldrin	0.0033 U	0.0034 U	0.0034 U	0.0033 U	0.0046 NJ	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
alpha-BHC	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
alpha-Chlordane	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.045 J	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Aroclor-1016	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1221	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1232	NA	NA	NA	NA	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.017 U
Aroclor-1242	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Aroclor-1248	NA	NA	NA	NA	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Aroclor-1254	NA	NA	NA	NA	0.0098 U	0.0099 U	0.0099 U	0.0098 U	0.0099 U	0.01 U	0.01 U
Aroclor-1260	NA	NA	NA	NA	0.02 U	0.021 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
beta-BHC	0.0025 U	0.0025 U	0.0026 U	0.0025 U	0.025 J	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
delta-BHC	0.0062 U	0.0063 U	0.0064 U	0.0062 U	0.012 J	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Dieldrin	0.0056 U	0.0057 U	0.0057 U	0.0056 U	0.047 J	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Endosulfan I	0.009 U	0.009 U	0.0091 U	0.0089 U	0.049 J	0.0089 U	0.0089 U	0.009 U	0.0089 U	0.009 U	0.009 U
Endosulfan II	0.0033 U	0.0034 U	0.0034 U	0.0033 U	0.04 J	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U
Endosulfan sulfate	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.026 J	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U
Endrin	0.0038 U	0.0038 U	0.0038 U	0.0037 U	0.053	0.0037 U	0.0037 U	0.0038 U	0.0037 U	0.0038 U	0.0038 U
Endrin aldehyde	0.0031 U	0.0032 U	0.0032 U	0.0031 U	0.0053 J	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U
Endrin ketone	0.012 U	0.013 U	0.013 U	0.012 U	0.029 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
gamma-BHC (Lindane)	0.005 U	0.005 U	0.0051 U	0.005 U	0.005 U	0.005 U	0.0049 U	0.005 U	0.0049 U	0.005 U	0.005 U
gamma-Chlordane	0.005 U	0.005 U	0.0051 U	0.005 U	0.026 J	0.005 U	0.0049 U	0.005 U	0.0049 U	0.005 U	0.005 U
Heptachlor	0.0082 U	0.0083 U	0.0084 U	0.0082 U	0.0074 J	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Heptachlor epoxide	0.0029 U	0.0029 U	0.003 U	0.0029 U	0.038 J	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U
Methoxychlor	0.0038 U	0.0038 U	0.0038 U	0.0037 U	0.061	0.0037 U	0.0037 U	0.0038 U	0.0037 U	0.0038 U	0.0038 U
Toxaphene	0.38 U	0.38 U	0.38 U	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U	0.37 U	0.38 U	0.38 U
Inorganics (UG/L)											
Aluminum	186 U	186 U	428 J	282 J	1,240 R	2,030 R	800 R	490 R	602 R	640 R	586 R
Antimony	66 U	20 U	20 U	20 U	36.8 J	20 U	20 U	20 U	20 U	72.7 J	20 U
Arsenic	50 U	66.2 U	66.2 U	66.2 U	50 U	50 U	50 U	66.2 U	66.2 U	50 U	50 U
Barium	33.4 J	29.6 J	33.9 J	31.7 J	9.84 J	13 J	10.6 J	8.47 J	10.5 J	10.3 J	9.64 J
Beryllium	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Cadmium	20 U	14.4 U	9.35 J	11.4 J	14.4 U	8.76 J	9.14 J	9.35 J	11 J	9.5 J	9.58 J
Calcium	519,000	503,000	539,000	512,000	421,000	424,000	410,000	427,000	427,000	425,000	425,000
Chromium	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U
Cobalt	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U
Copper	50 U	98.6 J	149 J	108 J	46.2 J	45 J	40.7 J	40.7 J	44 J	42 J	37.3 J
Iron	110 U	110 U	201 J	110 U	635 J	1,660 J	331 J	110 UJ	176 J	314 J	227 J
Lead	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U

Table A-1-5
Analytical Data - SWMU 6 Background Surface Water
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SW014	VWW06-SW015	VWW06-SW016	VWW06-SW017	VWW06-SW018	VWW06-SW019	VWW06-SW020	VWW06-SW021	VWW06-SW022	VWW06-SW023	
	VWW06-SW014-0211	VWW06-SW015-0211	VWW06-SW016-0211	VWW06-SW017-0211	VWW06-SW018-0211	VWW06-SW019-0211	VWW06-SW020-0211	VWW06-SW021-0211	VWW06-SW022-0211	VWW06-SW023-0211	VWW06-SW023P-0211
Chemical	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Magnesium	1,570,000	1,550,000	1,620,000	1,520,000	1,310,000	1,320,000	1,290,000	1,310,000	1,300,000	1,300,000	1,320,000
Manganese	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U
Mercury	0.0514 J	0.0516 J	0.074 UJ	0.074 UJ	0.074 U	0.074 U	0.0426 J	0.074 U	0.074 U	0.074 UJ	0.0405 J
Nickel	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U
Potassium	533,000	514,000	533,000	521,000	433,000	437,000	421,000	435,000	436,000	429,000	430,000
Selenium	113	102	99.6	50.7 J	84.2 J	89.6 J	54.9 J	103	49.3 J	82 U	82 U
Silver	5 U	5 U	10.4 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Sodium	13,600,000	13,600,000	13,800,000	13,200,000	11,000,000	11,200,000	11,100,000	11,000,000	11,000,000	10,800,000	10,800,000
Thallium	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U
Vanadium	8.8 U	8.8 U	8.8 U	8.8 U	5.9 J	7.77 J	4.98 J	8.8 U	8.8 U	8.8 U	5.46 J
Zinc	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U
Dissolved Metals (UG/L)											
Aluminum	186 U	186 U	252 J	200 J	186 U	186 U	186 U	186 U	186 U	186 U	186 U
Antimony	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic	50 U	66.2 U	66.2 U	66.2 U	50 U	50 U	50 U	66.2 U	66.2 U	66.2 U	50 U
Barium	26.4 J	26.6 J	28 J	28.4 J	8.65 J	10.2 J	9.74 J	7.76 J	9.8 J	10.6 J	7.41 J
Beryllium	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Cadmium	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U	14.4 U
Calcium	535,000	556,000	553,000	548,000	414,000 R	434,000 R	430,000 R	434,000 R	422,000 R	438,000 R	415,000 R
Chromium	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U
Cobalt	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U
Copper	50 U	54 U	54 U	54 U	50 U	50 U	50 U	54 U	54 U	54 U	26 J
Iron	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U	110 U
Lead	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	11.9 J
Magnesium	1,640,000 J	1,680,000 J	1,690,000 J	1,690,000 J	1,310,000 R	1,340,000 R	1,360,000 R	1,350,000 R	1,310,000 R	1,350,000 R	1,270,000 R
Manganese	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U
Mercury	0.0621 J	0.0551 J	0.0469 J	0.053 J	0.074 U	0.074 U	0.074 U	0.074 U	0.0454 J	0.074 UJ	0.074 UJ
Nickel	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U
Potassium	533,000	550,000	552,000	539,000	428,000 R	447,000 R	443,000 R	448,000 R	431,000 R	443,000 R	419,000 R
Selenium	100 J	114 J	82 U	82 U	68.8 J	105	72.8 J	104	96.8	121	65.9 J
Silver	5 U	5 U	10.4 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Sodium	13,900,000	14,500,000	15,600,000	13,700,000	10,900,000	10,900,000	11,300,000	11,100,000	10,900,000	11,400,000	10,500,000
Thallium	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U	88 U
Vanadium	8.8 U	8.8 U	8.8 U	5.37 J	8.8 U	8.8 U	4.94 J	4.5 J	5.82 J	5.78 J	8.8 U
Zinc	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U	80 U
Other Parameters (MG/L)											
Chromium (hexavalent)	0.053	0.044 J	0.043 J	0.097 J	0.021	0.018 J	0.029 J	0.008 J	0.012 J	0.029 J	0.047 J
Dissolved Other Parameters (MG/L)											
Chromium (hexavalent)	0.016 J	0.019 J	0.038 J	0.02 J	0.015 J	0.007 J	0.016 J	0.007 UJ	0.004 J	0.016 J	0.016 J

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

NJ - Qualitative identification questionable due to poor resolution, presumptively present at approximate quantity

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/L - Milligrams per liter

UG/L - Micrograms per liter

Table A-1-6
Analytical Data - SWMU 6 Background Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022	VWW06-SD023	
	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211	VWW06-SD023-0211	VWW06-SD023P-0211
Chemical	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Volatile Organic Compounds (UG/KG)											
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/KG)											
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A-1-6
Analytical Data - SWMU 6 Background Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022	VWW06-SD023	
	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211	VWW06-SD023-0211	VWW06-SD023P-0211
Chemical	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAH (HMW)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAH (LMW)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAH (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)											
4,4'-DDD	3.4 UJ	2.2 UJ	3.1 UJ	3.8 UJ	3.9 UJ	3.9 UJ	4.1 UJ	4.2 UJ	4.5 UJ	3.6 UJ	3.5 UJ
4,4'-DDE	1.3 J	1.1 UJ	1.6 UJ	2 UJ	2.1 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.4 UJ	1.9 UJ	1.8 UJ
4,4'-DDT	2.6 UJ	1.6 UJ	2.3 UJ	2.8 UJ	2.9 UJ	2.9 UJ	3 UJ	3.1 UJ	3.4 UJ	2.6 UJ	2.6 UJ

Table A-1-6
Analytical Data - SWMU 6 Background Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022	VWW06-SD023	
	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211	VWW06-SD023-0211	VWW06-SD023P-0211
Chemical	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Aldrin	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1 UJ	1 UJ
alpha-BHC	5 UJ	3.2 UJ	4.6 UJ	5.5 UJ	5.8 UJ	5.8 UJ	6 UJ	6.2 UJ	6.6 UJ	5.2 UJ	5.1 UJ
alpha-Chlordane	1.1 UJ	0.68 UJ	0.98 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ	1.1 UJ	1.1 UJ
Aroclor-1016	87 UJ	55 UJ	80 UJ	96 UJ	61 UJ	61 UJ	63 UJ	65 UJ	70 UJ	55 UJ	54 UJ
Aroclor-1221	80 UJ	51 UJ	73 UJ	89 UJ	56 UJ	56 UJ	58 UJ	60 UJ	64 UJ	51 UJ	50 UJ
Aroclor-1232	100 UJ	64 UJ	92 UJ	110 UJ	70 UJ	70 UJ	72 UJ	75 UJ	81 UJ	64 UJ	62 UJ
Aroclor-1242	74 UJ	47 UJ	67 UJ	81 UJ	51 UJ	51 UJ	53 UJ	55 UJ	59 UJ	46 UJ	45 UJ
Aroclor-1248	74 UJ	47 UJ	67 UJ	81 UJ	51 UJ	51 UJ	53 UJ	55 UJ	59 UJ	46 UJ	45 UJ
Aroclor-1254	64 UJ	40 UJ	58 UJ	70 UJ	44 UJ	44 UJ	46 UJ	47 UJ	51 UJ	40 UJ	39 UJ
Aroclor-1260	41 UJ	26 UJ	37 UJ	45 UJ	28 UJ	28 UJ	29 UJ	30 UJ	33 UJ	26 UJ	25 UJ
Polychlorinated biphenyls (PCBs)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1 UJ	1 UJ
delta-BHC	1.9 UJ	1.2 UJ	1.7 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.3 UJ	2.5 UJ	2 UJ	1.9 UJ
Dieldrin	1.1 UJ	0.68 UJ	0.98 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ	1.1 UJ	1.1 UJ
Endosulfan I	1.5 UJ	0.93 UJ	1.3 UJ	1.6 UJ	1.7 UJ	1.7 UJ	1.8 UJ	1.8 UJ	2 UJ	1.5 UJ	1.5 UJ
Endosulfan II	1.9 UJ	1.2 UJ	1.8 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.3 UJ	2.4 UJ	2.6 UJ	2 UJ	2 UJ
Endosulfan sulfate	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.4 UJ	1.4 UJ
Endrin	1.7 UJ	1.1 UJ	1.6 UJ	1.9 UJ	2 UJ	2 UJ	2.1 UJ	2.1 UJ	2.3 UJ	1.8 UJ	1.8 UJ
Endrin aldehyde	2.4 UJ	1.5 UJ	2.2 UJ	2.7 UJ	2.8 UJ	2.8 UJ	2.9 UJ	3 UJ	3.2 UJ	2.5 UJ	2.4 UJ
Endrin ketone	1.4 UJ	0.89 UJ	1.3 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.7 UJ	1.7 UJ	1.9 UJ	1.5 UJ	1.4 UJ
gamma-BHC (Lindane)	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.4 UJ	1.4 UJ
gamma-Chlordane	1.1 UJ	0.72 UJ	1 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ	1.4 UJ	1.5 UJ	1.2 UJ	1.2 UJ
Heptachlor	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.4 UJ	1.4 UJ
Heptachlor epoxide	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1 UJ	1 UJ
Methoxychlor	1.8 U	1.1 UJ	1.6 UJ	2 UJ	2.1 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.4 UJ	1.9 UJ	1.8 UJ
Toxaphene	170 UJ	110 UJ	150 UJ	180 UJ	190 UJ	190 UJ	200 UJ	200 UJ	220 UJ	170 UJ	170 UJ
Explosives (UG/KG)											
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (MG/KG)											
Aluminum	8,470 J	9,890 J	7,980 J	10,600 J	27,000 J	24,500 J	29,200 J	16,200 J	14,000 J	16,900 J	16,600 J
Antimony	1.33 UJ	0.89 UJ	1.35 UJ	1.51 UJ	1.01 UJ	1.17 UJ	1.03 UJ	1.02 UJ	1.09 UJ	0.974 UJ	0.835 UJ
Arsenic	2.5 UJ	2 J	1.4 UJ	2.1 J	5.9 J	5.5 J	2.6 J	6 J	6.2 J	3.1 J	2.8 J
Barium	8.21 J	7.11 J	9.6 J	11.3 J	14.8 J	14 J	19.8 J	11.6 J	9.56 J	12 J	11.3 J
Beryllium	0.89 UJ	0.593 UJ	0.902 UJ	1 UJ	0.648 J	0.478 J	0.612 J	0.678 UJ	0.38 J	0.395 J	0.339 J
Cadmium	0.175 J	0.185 UJ	0.282 UJ	0.314 UJ	0.211 UJ	0.244 UJ	0.214 UJ	0.212 UJ	0.227 UJ	0.203 UJ	0.174 UJ
Calcium	30,900 J	14,000 J	17,600 J	11,400 J	6,260 J	8,510 J	4,750 J	53,000 J	14,200 J	25,400 J	25,400 J
Chromium	10.9 J	20 J	10.3 J	6.7 J	14.9 J	13.7 J	15 J	14.1 J	14.8 J	15 J	15.1 J
Cobalt	3.81 J	3.94 J	3.3 J	4.47 J	8.48 J	7.33 J	7.01 J	5.03 J	5.08 J	5.26 J	5.18 J
Copper	29.7 J	23.4 J	37.1 J	28.5 J	44.6 J	42.4 J	47.6 J	32.1 J	32.5 J	39.6 J	37.4 J
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	10,400 J	9,300 J	14,400 J	8,870 J	35,300 J	34,000 J	29,400 J	19,600 J	20,000 J	23,500 J	22,800 J
Lead	3.94 J	4.64 J	6.38 J	7.08 J	12.6 J	11.3 J	12.2 J	6.18 J	6.06 J	6.94 J	6.35 J
Magnesium	13,000 J	9,920 J	11,000 J	15,800 J	9,660 J	9,420 J	8,880 J	9,550 J	10,300 J	9,390 J	8,700 J
Manganese	159 J	115 J	196 J	63 J	359 J	341 J	334 J	174 J	191 J	250 J	248 J
Mercury	0.0988 J	0.0669 J	0.131 J	0.0771 J	0.0985 J	0.0858 J	0.0707 J	0.043 J	0.0611 J	0.0754 J	0.0676 J
Nickel	7.15 J	7.3 J	5.8 J	5.16 J	8.43 J	7.88 J	8.6 J	7.1 J	6.79 J	7.44 J	7.15 J
Potassium	3,720 J	2,750 J	3,260 J	4,190 J	5,360 J	4,860 J	5,290 J	3,860 J	3,750 J	3,910 J	3,490 J
Selenium	2.5 UJ	1.1 UJ	1.4 UJ	2.1 UJ	1.6 UJ	1.4 J	1.9 J	4.4 J	2.6 J	1.6 J	1.5 J
Silver	0.89 UJ	0.593 UJ	0.902 UJ	1 UJ	0.674 UJ	0.78 UJ	0.684 UJ	0.678 UJ	0.726 UJ	0.649 UJ	0.557 UJ

Table A-1-6
Analytical Data - SWMU 6 Background Sediment
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022	VWW06-SD023	
	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211	VWW06-SD023-0211	VWW06-SD023P-0211
Chemical	02/07/11	02/07/11	02/07/11	02/07/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11
Sodium	62,000 J	39,400 J	56,700 J	74,700 J	36,300 J	37,000 J	30,800 J	37,700 J	40,600 J	32,200 J	28,800 J
Thallium	1.89 UJ	1.26 UJ	1.92 UJ	2.14 UJ	1.43 UJ	1.7 J	1.45 UJ	1.44 UJ	1.54 UJ	1.24 J	0.707 J
Vanadium	29.4 J	42.4 J	20.7 J	58.6 J	54.7 J	46.8 J	56.3 J	44.5 J	43.7 J	33.6 J	35.2 J
Zinc	40.4 J	42.2 J	31.9 J	34.9 J	76 J	70.9 J	67.8 J	43.1 J	43.4 J	51.4 J	49.6 J
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)											
Zinc, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acid volatile sulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters											
Ammonia (MG/KG)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (hexavalent) (UG/KG)	24,800 J	150,000 J	30,500 J	101,000 J	33,900 J	36,800 J	34,100 J	24,600 J	9,340 J	30,400 J	3,630 J
pH	7.22	7.17	7.26	7.07	7.3	7.25	7.05	7.52	7.3	7.23	6.96
Sulfide (MG/KG)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (MG/KG)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (UG/KG)											
TPH-diesel range	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH-gas range	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shading indicates detections
NA - Not analyzed
J - Analyte present, value may or may not be accurate or precise
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
UG/KG - Micrograms per kilogram
UMOL/G - Micromoles per gram

Table A-1-7
Analytical Data - SWMU 6 Sediment Post-Removal (2009)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SO130		VWW06-SO131	VWW06-SO132	VWW06-SO133	VWW06-SO134	VWW06-SO135	VWW06-SO137	VWW06-SO138	VWW06-SO139	VWW06-SO140		VWW06-SO141	VWW06-SO142	VWW06-SO145
	116701-06-Z-130	116701-06-Z-130A	116701-06-Z-131	116701-06-Z-132	116701-06-Z-133	116701-06-Z-134	116701-06-Z-135	116701-06-Z-137	116701-06-Z-138	116701-06-Z-139	116701-06-Z-140	116701-06-Z-140A	116701-06-Z-141	116701-06-Z-142	116701-06-Z-145
Chemical	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09
Volatile Organic Compounds (UG/KG)															
1,1,1-Trichloroethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
1,1,2,2-Tetrachloroethane	16 U	16 UJ	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 UJ	5.8 UJ	7.6 UJ	8.5 U	6.7 U	6.7 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
1,1-Dichloroethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
1,1-Dichloroethene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
1,2-Dichloroethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
1,2-Dichloropropane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
1,3-Dichlorobenzene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
1,4-Dichlorobenzene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2-Butanone	79 U	78 U	49 U	32 U	40 U	74 U	67 U	27 U	36 U	35 U	29 U	38 U	43 U	33 U	34 U
2-Hexanone	79 U	78 U	49 U	32 U	40 U	74 U	67 U	27 U	36 U	35 U	29 U	38 U	43 U	33 U	34 U
4-Methyl-2-pentanone	79 U	78 U	49 U	32 U	40 U	74 U	67 U	27 U	36 U	35 U	29 U	38 U	43 U	33 U	34 U
Acetone	160 UJ	114 J	97 U	64 UJ	80 UJ	150 UJ	130 UJ	54 UJ	72 UJ	71 UJ	58 UJ	76 UJ	85 U	67 UJ	67 UJ
Benzene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Bromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Bromoform	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Bromomethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Carbon disulfide	12.7 J	9.8 J	9.7 U	6.4 U	4.7 J	7.3 J	6.8 J	5.4 U	7.2	3.3 J	5.8 U	3.5 J	3.2 J	6.7 U	5.1 J
Carbon tetrachloride	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Chlorobenzene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Chloroethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 UJ	6.7 UJ
Chloroform	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Chloromethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
cis-1,2-Dichloroethene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
cis-1,3-Dichloropropene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	32 U	31 U	11.3 J	13 U	16 U	30 U	27 U	11 U	14 U	14 U	12 U	15 U	17 U	13 U	13 U
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	16 U	16 U	9.7 U	1.7 J	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Tetrachloroethene	16 UJ	16 UJ	9.7 UJ	6.4 UJ	8 UJ	15 UJ	13 UJ	5.4 UJ	7.2 UJ	7.1 UJ	5.8 UJ	7.6 UJ	8.5 U	6.7 U	6.7 U
Toluene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
trans-1,2-Dichloroethene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
trans-1,3-Dichloropropene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Trichloroethene	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 U	6.7 U
Trichlorofluoromethane (Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	16 U	16 U	9.7 U	6.4 U	8 U	15 U	13 U	5.4 U	7.2 U	7.1 U	5.8 U	7.6 U	8.5 U	6.7 UJ	6.7 UJ
Xylene, total	48 U	47 U	29 U	19 U	24 U	45 U	40 U	16 U	22 U	21 U	17 U	23 U	26 U	20 U	20 U
Semivolatile Organic Compounds (UG/KG)															
1-Methylnaphthalene	590 U	560 U	460 U	310 U	410 U	490 U	490 U	380 U	410 U	390 U	400 U	410 U	440 U	360 U	380 U
2,2'-Oxybis(1-chloropropane)	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2,4,5-Trichlorophenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2,4,6-Trichlorophenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2,4-Dichlorophenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2,4-Dimethylphenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2,4-Dinitrophenol	1,900 U	1,800 U	1,400 U	970 U	1,300 U	1,500 U	1,500 U	1,200 U	1,300 U	1,200 U	1,300 U	1,300 U	1,400 U	1,100 U	1,200 U
2,4-Dinitrotoluene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
2,6-Dinitrotoluene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
2-Chloronaphthalene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2-Chlorophenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2-Methylnaphthalene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2-Methylphenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
2-Nitroaniline	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
2-Nitrophenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
3- and 4-Methylphenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
3,3'-Dichlorobenzidine	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
3-Nitroaniline	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U

Table A-1-7
Analytical Data - SWMU 6 Sediment Post-Removal (2009)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SO130		VWW06-SO131	VWW06-SO132	VWW06-SO133	VWW06-SO134	VWW06-SO135	VWW06-SO137	VWW06-SO138	VWW06-SO139	VWW06-SO140		VWW06-SO141	VWW06-SO142	VWW06-SO145
	116701-06-Z-130	116701-06-Z-130A	116701-06-Z-131	116701-06-Z-132	116701-06-Z-133	116701-06-Z-134	116701-06-Z-135	116701-06-Z-137	116701-06-Z-138	116701-06-Z-139	116701-06-Z-140	116701-06-Z-140A	116701-06-Z-141	116701-06-Z-142	116701-06-Z-145
Chemical	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09
4,6-Dinitro-2-methylphenol	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
4-Bromophenyl-phenylether	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
4-Chloro-3-methylphenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
4-Chloroaniline	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
4-Chlorophenyl-phenylether	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
4-Nitroaniline	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
4-Nitrophenol	1,900 U	1,800 U	1,400 U	970 U	1,300 U	1,500 U	1,500 U	1,200 U	1,300 U	1,200 U	1,300 U	1,300 U	1,400 U	1,100 U	1,200 U
Acenaphthene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Acenaphthylene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Anthracene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Benzo(a)anthracene	188 J	72.4 J	46 U	82 J	27 J	49 U	171	38 U	37.7 J	55.7 J	40 U	41 U	50.6	36 U	38 U
Benzo(a)pyrene	205 J	93.7 J	29.3 J	122	52.9 J	38.3 J	343	38 U	42.2	62	40 U	41 U	71 J	36 U	38 U
Benzo(b)fluoranthene	336 J	176 J	47.5	213	93.8 J	66	624	27.4 J	103 J	129 J	40 U	41 U	141 J	30.8 J	38 U
Benzo(g,h,i)perylene	111	90.9 J	46 U	87	47.6	40.5 J	291	38 U	33.4 J	41.4	40 U	41 U	46.8	36 U	38 U
Benzo(k)fluoranthene	124 J	60.9 J	46 U	71.6	30.1 J	49 U	194 J	38 U	37.3 J	45.6	40 U	41 U	48.4	36 U	38 U
Benzoic acid	1,900 U	1,800 U	1,400 U	970 U	1,300 U	1,500 U	1,500 U	1,200 UJ	1,300 U	1,200 U	1,300 U	1,300 U	1,400 U	1,100 U	1,200 U
Benzyl alcohol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
bis(2-Chloroethoxy)methane	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
bis(2-Chloroethyl)ether	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
bis(2-Ethylhexyl)phthalate	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
Butylbenzylphthalate	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
Carbazole	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Chrysene	239 J	84.3 J	27.2 J	91.9	35 J	30.3 J	233 J	38 U	58.1 J	74.7 J	40 U	41 U	90	36 U	38 U
Dibenz(a,h)anthracene	59 U	56 U	46 U	31 U	41 U	49 U	65.8 J	38 U	41 U	39 U	40 U	41 U	44 U	36 U	38 U
Dibenzofuran	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Diethylphthalate	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
Dimethyl phthalate	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
Di-n-butylphthalate	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
Di-n-octylphthalate	740 U	700 U	580 U	390 U	510 U	620 U	610 U	480 U	510 U	480 U	500 U	510 U	550 U	450 U	480 U
Fluoranthene	219 J	214 J	290 U	101 J	260 U	310 U	201 J	240 U	89.3 J	139 J	250 U	260 U	116 J	220 U	240 U
Fluorene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Hexachlorobenzene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Hexachlorobutadiene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Hexachlorocyclopentadiene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 UJ	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Hexachloroethane	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Indeno(1,2,3-cd)pyrene	114 J	84.4	29 J	126	46	39.6 J	322	38 U	37.9 J	48.9	40 U	41 U	55.5	36 U	38 U
Isophorone	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Naphthalene	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
n-Nitroso-di-n-propylamine	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
n-Nitrosodiphenylamine	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Nitrobenzene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
Pentachlorophenol	1,900 U	1,800 U	1,400 U	970 U	1,300 U	1,500 U	1,500 U	1,200 U	1,300 U	1,200 U	1,300 U	1,300 U	1,400 U	1,100 U	1,200 U
Phenanthrene	370 U	78.6 J	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Phenol	370 U	350 U	290 U	190 U	260 U	310 U	310 U	240 U	250 U	240 U	250 U	260 U	270 U	220 U	240 U
Pyrene	201 J	176 J	290 U	99.5 J	56.6 J	310 U	285 J	240 U	75.8 J	124 J	250 U	260 U	100 J	220 U	240 U
Pesticide/Polychlorinated Biphenyls (UG/KG)															
4,4'-DDD	65.1 J	66.9 J	6.1	35.6 J	96.6	64 U	10.9	4.7 U	52 U	21.3 J	5 U	5.1 U	56 U	44 U	4.8 U
4,4'-DDE	57.5	80.7	12.4	86	94.4	5 J	21.5	2.3 J	3.4 J	35.3 J	5 U	5.1 U	56 U	8.9	4.8 U
4,4'-DDT	29.4 J	62.1 J	12.4	352	52 U	64 U	7.9	4.7 UJ	5.2 U	11.9 J	5 U	5.1 U	56 U	44 U	4.8 UJ
Aldrin	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 U	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
alpha-BHC	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 U	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
alpha-Chlordane	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 UJ	2.6 U	24 U	2.5 U	2.6 U	25.1 J	2.2 U	2.4 U
Aroclor-1016	37 U	36 U	28 U	19 U	26 U	32 U	32 U	24 U	26 U	24 U	25 U	26 U	28 U	22 U	24 U
Aroclor-1221	37 U	36 U	28 U	19 U	26 U	32 U	32 U	24 U	26 U	24 U	25 U	26 U	28 U	22 U	24 U
Aroclor-1232	37 U	36 U	28 U	19 U	26 U	32 U	32 U	24 U	26 U	24 U	25 U	26 U	28 U	22 U	24 U
Aroclor-1242	37 U	36 U	28 U	19 U	26 U	32 U	32 U	24 U	26 U	24 U	25 U	26 U	28 U	22 U	24 U
Aroclor-1248	37 U	36 U	28 U	19 U	26 U	32 U	32 U	24 U	26 U	24 U	25 U	26 U	28 U	22 U	24 U
Aroclor-1254	82.6 J	145 J	34.5	19 U	26 U	24.3 J	47.3	24 U	26 U	231	25 U	26 U	28 U	61.3	24 U
Aroclor-1260	37 U	36 U	28 U	19 U	26 U	32 U	32 U	24 U	26 U	24 U	25 U	26 U	28 U	22 U	24 U
beta-BHC	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 U	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
delta-BHC	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 U	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
Dieldrin	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 UJ	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
Endosulfan I	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 U	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
Endosulfan II	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 U	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
Endosulfan sulfate	30 U	29 U	5.6 U	78 U	52 U	6.4 U	6.3 U	4.7 U	5.2 U	48 U	5 U	5.1 U	56 U	4.4 U	4.8 U
Endrin	30 U	29 U	5.6 U	78 U	52 U	6.4 U	6.3 U	4.7 U	5.2 U	48 U	5 U	5.1 U	56 U	4.4 U	4.8 U
Endrin aldehyde	30 U	29 U	5.6 U	78 U	52 U	6.4 U	6.3 U	4.7 U	5.2 U	48 U	5 U	5.1 U	56 U	4.4 U	4.8 U
Endrin ketone	30 U	29 U	5.6 U	78 U	52 U	6.4 U	6.3 U	4.7 UJ	5.2 U	48 U	5 U	5.1 U	56 U	4.4 U	4.8 U
gamma-BHC (Lindane)	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 U	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
gamma-Chlordane	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 UJ	2.6 U	24 U	2.5 U	2.6 U	28.2	2.2 U	2.4 U

Table A-1-7
Analytical Data - SWMU 6 Sediment Post-Removal (2009)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SO130		VWW06-SO131	VWW06-SO132	VWW06-SO133	VWW06-SO134	VWW06-SO135	VWW06-SO137	VWW06-SO138	VWW06-SO139	VWW06-SO140		VWW06-SO141	VWW06-SO142	VWW06-SO145
	116701-06-Z-130	116701-06-Z-130A	116701-06-Z-131	116701-06-Z-132	116701-06-Z-133	116701-06-Z-134	116701-06-Z-135	116701-06-Z-137	116701-06-Z-138	116701-06-Z-139	116701-06-Z-140	116701-06-Z-140A	116701-06-Z-141	116701-06-Z-142	116701-06-Z-145
Chemical	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09
Heptachlor	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 U	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
Heptachlor epoxide	15 U	14 U	2.8 U	39 U	26 U	3.2 U	3.1 U	2.4 UJ	2.6 U	24 U	2.5 U	2.6 U	28 U	2.2 U	2.4 U
Methoxychlor	30 U	29 U	5.6 U	78 U	52 U	6.4 U	6.3 U	4.7 UJ	5.2 U	48 U	5 U	5.1 U	56 U	4.4 UJ	4.8 UJ
Polychlorinated biphenyls (PCBs)	82.6 J	145 J	34.5 J	39 U	52 U	64 U	47.3 J	47 U	52 U	231	50 U	51 U	56 U	61.3	48 U
Toxaphene	750 U	710 U	140 U	1,900 U	1,300 U	160 U	160 U	120 U	130 U	1,200 U	130 U	130 U	1,400 U	110 U	120 U
Explosives (UG/KG)															
1,3,5-Trinitrobenzene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
1,3-Dinitrobenzene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
2,4,6-Trinitrotoluene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
2-Amino-4,6-dinitrotoluene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
2-Nitrotoluene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
3-Nitrotoluene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
4-Amino-2,6-dinitrotoluene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
4-Nitrotoluene	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
HMX	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
RDX	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
Tetryl	190 U	160 U	170 U	140 U	140 U	180 U	180 U	160 U	170 U	160 U	160 U	150 U	160 U	160 U	150 U
Inorganics (MG/KG)															
Aluminum	10,500	9,920	5,170	8,030	5,240	6,560	7,400	4,010	3,520	5,940	3,330	2,960	5,940	16,000	3,990
Antimony	4.8 J	6.6 J	20 U	2.1 J	5.8 J	3.4 J	3.3 J	17 U	18 U	2.2 J	17 U	19 U	1.8 J	1.2 J	17 U
Arsenic	4.7	5.4	2.4 J	1.8	3	2.8 J	3.8	1.7 J	2 J	2.4	2.3 U	1.4 J	2 J	0.69	1.5 J
Barium	37.2	43.1	25.1	31.8	37	19.7	26	17.6	12.2 J	18.5	7.1 J	8.4 J	10.9 J	58.7	15.9
Beryllium	0.56 U	0.52 U	0.43 U	0.13 J	0.37 U	0.45 U	0.45 U	0.35 U	0.38 U	0.36 U	0.36 U	0.39 U	0.41 U	0.32 J	0.35 U
Cadmium	0.99	1.6	0.35	0.79	0.69	0.57	2.4	0.12 J	0.36	2.4	0.29 U	0.32 U	0.45	0.31	0.2 J
Calcium	130,000	91,800	122,000	84,500	106,000	134,000	76,600	124,000	105,000	96,500	99,400	99,800	110,000	12,500	109,000
Chromium	18	22.9	10	16.3	12.4	8.6	15.2	6.7	5.4	10	3.1	3.2	7	23.7	5.3
Cobalt	6.7	8	3.3 J	6.7	3.1 J	2.8 J	4.9	2.2 J	1.7 J	4.7	1.1 J	1 J	3.1 J	16.2	1.7 J
Copper	147	186	35.8	69.9	91.5	53.4	92.2	25.1	19.3	55.1	5.4	4.8	32.2	65.7	9.2
Cyanide	0.23 U	0.23 U	0.18 U	0.13 U	0.17 U	0.2 U	0.22 U	0.15 U	0.16 U	0.16 U	0.15 U	0.16 U	0.19 U	0.14 U	0.16 U
Iron	28,100	38,000	12,200	17,100	16,100	12,100	20,500	6,860	7,110	15,700	3,090	3,130	10,300	26,700	4,960
Lead	412	508	59.7	145	288	190	237	62.1	74.7	120	4.3 J	2.8 J	49	47.7	9.1 J
Magnesium	6,270	6,760	3,020	5,990	3,540	3,780	5,060	3,080	2,840	4,040	1,820	1,830	3,640	9,850	3,190
Manganese	295	390	135	426	212	131	234	75.6	84.2	189	37.6	40.1	105	961	149
Mercury	0.12 J	0.15 J	0.051 J	0.035 J	0.043 J	0.067 J	0.13 J	0.02 J	0.042 J	0.033 J	0.11 U	0.13 U	0.024 J	0.027 J	0.02 J
Nickel	12.6	16.7	7.9	10.7	7.5	5.4	9.2	4.7	2.4 J	6.5	1.1 J	1.1 J	5.5	18.1	1.9 J
Potassium	3,180	2,990	1,730	1,550	1,730	2,210	2,450	1,500	1,390	1,640	1,260	1,210	1,810	2,800	1,460
Selenium	3.6 J	2 J	3.8 J	2.4 J	2.6 J	5.1 J	2.2 J	4.4 J	3.6 J	2.8 J	4.2 J	4 J	4.1 J	6.5 U	2.6 J
Silver	0.42 J	0.67 J	0.85 U	0.27 J	0.11 J	0.12 J	0.33 J	0.69 U	0.75 U	0.72 U	0.73 U	0.79 U	0.83 U	0.084 J	0.71 U
Sodium	20,800	16,400	9,970	8,430	9,170	13,700	14,700	9,180	8,820	5,660	8,530	7,410	9,610	7,070	8,560
Thallium	5.5 U	10 U	8.5 U	11 U	7.5 U	4.6 U	9 U	3.5 U	3 U	7.2 U	3.7 U	3.2 U	4.2 U	13 U	3.6 U
Vanadium	36.8	39.9	18.4	29	16.9	18.3	30	13.8	12.1	28.2	9.7	10.5	19.9	82.3	16
Zinc	369 J	615 J	79.8 J	126 J	366 J	166 J	278 J	56.7 J	106 J	164 J	9.9 J	8.5 J	94.4 J	127 J	17.5
Acid Volatile Sulfide/Simultaneously Extractable Metals (UMOL/G)															
Zinc, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acid volatile sulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver, SEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters (various units)															
Ammonia (MG/KG)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia (UG/KG)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (hexavalent) (UG/KG)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH (PH)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide (MG/KG)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC) (MG/KG)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Grain Size (PCT)															
Gravel (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GRAINSIZE(PCT/P)															
GS05 Sieve 2" (50 mm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GS07 Sieve 1" (25.0 mm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GS10 Sieve 0.375" (9.5 mm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GRAINSIZE(PCT)															
Sand (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GRAINSIZE(PCT/P)															
Sieve No. 004 (4.75 mm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 010 (2.00 mm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 030 (600-UM)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A-1-7
Analytical Data - SWMU 6 Sediment Post-Removal (2009)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	VWW06-SO130		VWW06-SO131	VWW06-SO132	VWW06-SO133	VWW06-SO134	VWW06-SO135	VWW06-SO137	VWW06-SO138	VWW06-SO139	VWW06-SO140		VWW06-SO141	VWW06-SO142	VWW06-SO145
	116701-06-Z-130	116701-06-Z-130A	116701-06-Z-131	116701-06-Z-132	116701-06-Z-133	116701-06-Z-134	116701-06-Z-135	116701-06-Z-137	116701-06-Z-138	116701-06-Z-139	116701-06-Z-140	116701-06-Z-140A	116701-06-Z-141	116701-06-Z-142	116701-06-Z-145
Chemical	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09	06/24/09
Sieve No. 050 (300-UM)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 100 (150 um)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sieve No. 200 (75 um)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GRAINSIZE(PCT)															
Silt (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (UG/KG)															
TPH-diesel range	18,400	19,000	53,900	5,830 J	17,900	16,000 U	12,700 J	12,000 U	12,000 J	8,220 J	13,000 U	13,000 U	11,100 J	11,000 U	12,000 U
TPH-gas range	20,000 U	22,000 U	15,000 U	6,700 U	12,000 U	17,000 U	16,000 U	11,000 U	10,000 U	9,600 U	9,700 U	10,000 U	12,000 U	8,700 U	9,400 U

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/KG - Milligrams per kilogram

PCT - Percent

PH - pH units

UG/KG - Micrograms per kilogram

UMOL/G - Micromoles per gram

Attachment B
Equilibrium Partitioning Calculations

Attachment B
Calculated Equilibrium Partitioning (EqP) Sediment Values
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Marine Water ESV	Units	Reference	log Kow	Reference	Koc[a]	Total Organic Carbon (%)	Sediment EqP Value[b]	Units
Pesticides									
4,4'-DDD	0.001	ug/L	Table F-13	6.10	USEPA 1995a	992,156	1.00	9.92	ug/kg
4,4'-DDE	0.001	ug/L	Table F-13	6.76	USEPA 1995a	4,419,366	1.00	44.2	ug/kg
4,4'-DDT	0.001	ug/L	Table F-13	6.53	USEPA 1995a	2,625,851	1.00	26.3	ug/kg
Heptachlor epoxide	0.0036	ug/L	Table F-13	5.00	USEPA 1995a	82,277	1.00	2.96	ug/kg
Volatile Organic Compounds									
Acetone	564,000	ug/L	Table F-13	-0.24	USEPA 1995a	0.58	1.00	3,278	ug/kg

[a] Koc calculated according to equation and method described in USEPA (1996a): $Koc = 10^{(0.00028 + 0.983 * \log Kow)}$

[b] Sediment screening value calculated according to equation and method described in USEPA (1996a): EqP (ug/kg) = water ESV (ug/L) * Koc * (total organic carbon [%]/100)

Attachment C
Aquatic Food Web Calculations Modeled From Sediment

ATTACHMENT TABLE C-1
Summary of Green Heron Exposure Doses - Screening (Step 2)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	7.80	0.69	5.38E+00	0	0	0.126	9.83E-01	0	1.83E-01	5.14	8.12	12.8	3.56E-02	2.25E-02	1.42E-02
Cadmium	5.69	3.07	1.75E+01	0	0	0.220	1.25E+00	0	2.33E-01	1.47	3.29	7.35	1.58E-01	7.08E-02	3.17E-02
Chromium	37.0	0.47	1.73E+01	0	0	0.038	1.41E+00	0	2.62E-01	2.66	5.95	13.3	9.83E-02	4.40E-02	1.97E-02
Copper	204	7.96	1.62E+03	0	0	0.100	2.04E+01	0	3.79E+00	4.05	7.00	12.1	9.37E-01	5.42E-01	3.14E-01
Lead	612	0.33	2.00E+02	0	0	0.130	7.96E+01	0	1.48E+01	3.85	8.61	19.3	3.84E+00	1.72E+00	7.69E-01
Mercury	0.13	2.87	3.70E-01	0	0	4.58	5.91E-01	0	1.10E-01	0.026	0.045	0.078	4.23E+00	2.44E+00	1.41E+00
Nickel	19.1	0.21	4.09E+00	0	0	1.00	1.91E+01	0	3.55E+00	6.71	15.0	33.6	5.29E-01	2.37E-01	1.06E-01
Selenium	1.40	5.55	7.77E+00	0	0	1.00	1.40E+00	0	2.60E-01	1.80	4.02	9.00	1.45E-01	6.47E-02	2.89E-02
Silver	0.30	0.18	5.31E-02	0	0	1.00	2.95E-01	0	5.49E-02	4.04	9.03	20.2	1.36E-02	6.07E-03	2.72E-03
Zinc	849	4.76	4.04E+03	0	0	1.30	1.10E+03	0	2.05E+02	66.1	148	331	3.11E+00	1.39E+00	6.21E-01
Polychlorinated Biphenyls															
Aroclor-1016	0.0640	21.9	1.40E+00	0	0	31.1	1.99E+00	0	3.70E-01	1.50	3.35	7.50	2.47E-01	1.10E-01	4.94E-02
Aroclor-1221	0.0590	21.9	1.29E+00	0	0	31.1	1.84E+00	0	3.41E-01	1.50	3.35	7.50	2.28E-01	1.02E-01	4.55E-02
Aroclor-1232	0.0740	21.9	1.62E+00	0	0	31.1	2.30E+00	0	4.28E-01	1.50	3.35	7.50	2.85E-01	1.28E-01	5.71E-02
Aroclor-1242	0.0540	21.9	1.18E+00	0	0	31.1	1.68E+00	0	3.12E-01	1.50	3.35	7.50	2.08E-01	9.31E-02	4.17E-02
Aroclor-1248	0.0540	21.9	1.18E+00	0	0	31.1	1.68E+00	0	3.12E-01	1.50	3.35	7.50	2.08E-01	9.31E-02	4.17E-02
Aroclor-1254	0.2600	21.9	5.69E+00	0	0	31.1	8.09E+00	0	1.50E+00	1.50	3.35	7.50	1.00E+00	4.48E-01	2.01E-01
Aroclor-1260	0.0300	21.9	6.57E-01	0	0	31.1	9.33E-01	0	1.74E-01	1.50	3.35	7.50	1.16E-01	5.17E-02	2.31E-02
Pesticides															
4,4'-DDD	0.0590	7.5	4.45E-01	0	0	25.8	1.52E+00	0	2.84E-01	0.30	0.95	3.00	9.45E-01	2.99E-01	9.45E-02
4,4'-DDE	0.0940	7.5	7.08E-01	0	0	290	2.73E+01	0	5.08E+00	0.30	0.95	3.00	1.69E+01	5.35E+00	1.69E+00
4,4'-DDT	0.0032	1.37	4.40E-03	0	0	29.4	9.40E-02	0	1.75E-02	0.30	0.95	3.00	5.83E-02	1.84E-02	5.83E-03
Aldrin	0.0015	2.07	3.11E-03	0	0	30.3	4.54E-02	0	8.44E-03	0.155	0.347	0.775	5.45E-02	2.44E-02	1.09E-02
alpha-BHC	0.0074	8.6	6.37E-02	0	0	30.3	2.24E-01	0	4.17E-02	0.56	1.12	2.25	7.44E-02	3.71E-02	1.85E-02
alpha-Chlordane	0.0016	7.5	1.21E-02	0	0	43.9	7.02E-02	0	1.31E-02	0.80	1.79	4.00	1.63E-02	7.30E-03	3.27E-03
beta-BHC	0.0015	8.6	1.29E-02	0	0	30.3	4.54E-02	0	8.44E-03	0.56	1.12	2.25	1.51E-02	7.52E-03	3.75E-03
delta-BHC	0.0028	8.6	2.41E-02	0	0	30.3	8.47E-02	0	1.58E-02	0.56	1.12	2.25	2.81E-02	1.40E-02	7.00E-03
Dieldrin	0.0016	4.92	7.87E-03	0	0	91	1.45E-01	0	2.70E-02	0.071	0.52	3.78	3.81E-01	5.22E-02	7.15E-03
Endosulfan I	0.0022	0.29	6.41E-04	0	0	30.3	6.66E-02	0	1.24E-02	10.0	22.4	50.0	1.24E-03	5.54E-04	2.48E-04
Endosulfan II	0.0028	0.29	8.16E-04	0	0	30.3	8.47E-02	0	1.58E-02	10.0	22.4	50.0	1.58E-03	7.05E-04	3.15E-04
Endrin	0.0026	2.40	6.25E-03	0	0	30.3	7.87E-02	0	1.46E-02	0.30	0.67	1.50	4.88E-02	2.18E-02	9.76E-03
gamma-BHC (Lindane)	0.0020	7.8	1.57E-02	0	0	30.3	6.05E-02	0	1.13E-02	4.00	8.9	20.0	2.81E-03	1.26E-03	5.63E-04
gamma-Chlordane	0.0017	10.6	1.81E-02	0	0	33.7	5.72E-02	0	1.06E-02	0.80	1.79	4.00	1.33E-02	5.95E-03	2.66E-03
Heptachlor	0.0020	0.30	6.01E-04	0	0	30.3	6.05E-02	0	1.13E-02	0.48	1.07	2.40	2.35E-02	1.05E-02	4.69E-03
Heptachlor epoxide	0.0015	1.49	2.24E-03	0	0	30.3	4.54E-02	0	8.44E-03	0.48	1.07	2.40	1.76E-02	7.87E-03	3.52E-03
Methoxychlor	0.0027	1.00	2.70E-03	0	0	30.3	8.17E-02	0	1.52E-02	355	794	1,775	4.28E-05	1.91E-05	8.56E-06
Toxaphene	0.2500	1.00	2.50E-01	0	0	30.3	7.57E+00	0	1.41E+00	1.00	2.24	5.00	1.41E+00	6.29E-01	2.81E-01
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0041	1.00	4.10E-03	0	0	1.00	4.10E-03	0	7.63E-04	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0044	0.48	2.12E-03	0	0	2.94	1.29E-02	0	2.41E-03	32.2	71.9	161	7.49E-05	3.35E-05	1.50E-05
1,2-Dichlorobenzene	0.0039	1.00	3.90E-03	0	0	1.88	7.34E-03	0	1.37E-03	32.2	71.9	161	4.25E-05	1.90E-05	8.49E-06
1,3-Dichlorobenzene	0.0032	1.00	3.20E-03	0	0	0.34	1.08E-03	0	2.00E-04	32.2	71.9	161	6.22E-06	2.78E-06	1.24E-06
1,4-Dichlorobenzene	0.0046	1.00	4.60E-03	0	0	0.24	1.08E-03	0	2.01E-04	32.2	71.9	161	6.26E-06	2.80E-06	1.25E-06
Acenaphthene	0.0119	17.6	2.09E-01	0	0	0.72	8.57E-03	0	1.59E-03	7.10	15.9	35.5	2.25E-04	1.00E-04	4.49E-05

ATTACHMENT TABLE C-1
Summary of Green Heron Exposure Doses - Screening (Step 2)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Acenaphthylene	0.0200	17.6	3.51E-01	0	0	0.45	8.93E-03	0	1.66E-03	7.10	15.9	35.5	2.34E-04	1.05E-04	4.68E-05
Anthracene	0.0282	5.29	1.49E-01	0	0	0.22	6.22E-03	0	1.16E-03	7.10	15.9	35.5	1.63E-04	7.29E-05	3.26E-05
Benzo(a)anthracene	0.1020	1.80	1.83E-01	0	0	0.52	5.32E-02	0	9.90E-03	7.10	15.9	35.5	1.39E-03	6.23E-04	2.79E-04
Benzo(a)pyrene	0.1100	6.06	6.67E-01	0	0	0.06	6.54E-03	0	1.22E-03	7.10	15.9	35.5	1.71E-04	7.66E-05	3.42E-05
Benzo(b)fluoranthene	0.1600	2.15	3.44E-01	0	0	0.07	1.06E-02	0	1.97E-03	7.10	15.9	35.5	2.78E-04	1.24E-04	5.56E-05
Benzo(g,h,i)perylene	0.0622	1.30	8.09E-02	0	0	0.95	5.93E-02	0	1.10E-02	7.10	15.9	35.5	1.55E-03	6.95E-04	3.11E-04
Benzo(k)fluoranthene	0.0634	1.84	1.17E-01	0	0	0.06	3.88E-03	0	7.22E-04	7.10	15.9	35.5	1.02E-04	4.55E-05	2.03E-05
Chrysene	0.0924	2.14	1.98E-01	0	0	0.38	3.47E-02	0	6.45E-03	7.10	15.9	35.5	9.09E-04	4.06E-04	1.82E-04
Dibenz(a,h)anthracene	0.0456	17.2	7.85E-01	0	0	0.06	2.78E-03	0	5.18E-04	7.10	15.9	35.5	7.30E-05	3.26E-05	1.46E-05
Fluoranthene	0.1220	1.48	1.81E-01	0	0	0.16	1.97E-02	0	3.67E-03	7.10	15.9	35.5	5.17E-04	2.31E-04	1.03E-04
Fluorene	0.0116	7.6	8.83E-02	0	0	2.09	2.43E-02	0	4.51E-03	7.10	15.9	35.5	6.36E-04	2.84E-04	1.27E-04
Indeno(1,2,3-cd)pyrene	0.0614	1.05	6.43E-02	0	0	0.67	4.13E-02	0	7.67E-03	7.10	15.9	35.5	1.08E-03	4.83E-04	2.16E-04
Phenanthrene	0.1110	2.45	2.72E-01	0	0	1.05	1.17E-01	0	2.17E-02	7.10	15.9	35.5	3.05E-03	1.37E-03	6.11E-04
Pyrene	0.1250	13.1	1.64E+00	0	0	0.78	9.71E-02	0	1.81E-02	7.10	15.9	35.5	2.54E-03	1.14E-03	5.09E-04

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI =	Chemical-specific	= Dietary intake for chemical (mg chemical/kg body weight/day)
FIR =	0.0257	= Food ingestion rate (kg/day dry weight)
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi =	0.000	= Proportion of diet composed of food item (aquatic invertebrates)
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi =	0.000	= Proportion of diet composed of food item (aquatic plants)
FCxi =	Chemical-specific	= Concentration of chemical in food item (fish, dry weight basis)
PDFi =	1.000	= Proportion of diet composed of food item (fish)
SCx =	Chemical-specific	= Concentration of chemical in sediment (mg/kg, dry weight)
PDS =	0.000	= Proportion of diet composed of sediment
WIR =	0.0214	= Water ingestion rate (L/day)
WC =	Chemical-specific	= Concentration of chemical in water (mg/L)
BW =	0.138	= Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

ATTACHMENT TABLE C-2
Summary of Spotted Sandpiper Exposure Doses - Screening (Step 2)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	7.80	0.69	5.38E+00	0	0	0.126	9.83E-01	0	2.08E+00	5.14	8.12	12.8	4.05E-01	2.56E-01	1.62E-01
Cadmium	5.69	3.07	1.75E+01	0	0	0.220	1.25E+00	0	5.49E+00	1.47	3.29	7.35	3.74E+00	1.67E+00	7.48E-01
Chromium	37.0	0.47	1.73E+01	0	0	0.038	1.41E+00	0	7.46E+00	2.66	5.95	13.3	2.80E+00	1.25E+00	5.61E-01
Copper	204	7.96	1.62E+03	0	0	0.100	2.04E+01	0	4.89E+02	4.05	7.00	12.1	1.21E+02	6.99E+01	4.04E+01
Lead	612	0.33	2.00E+02	0	0	0.130	7.96E+01	0	9.79E+01	3.85	8.61	19.3	2.54E+01	1.14E+01	5.09E+00
Mercury	0.13	2.87	3.70E-01	0	0	4.58	5.91E-01	0	1.17E-01	0.026	0.045	0.078	4.49E+00	2.59E+00	1.50E+00
Nickel	19.1	0.21	4.09E+00	0	0	1.00	1.91E+01	0	2.43E+00	6.71	15.0	33.6	3.62E-01	1.62E-01	7.24E-02
Selenium	1.40	5.55	7.77E+00	0	0	1.00	1.40E+00	0	2.37E+00	0.40	0.57	0.80	5.92E+00	4.19E+00	2.96E+00
Silver	0.30	0.18	5.31E-02	0	0	1.00	2.95E-01	0	3.46E-02	4.04	9.03	20.2	8.56E-03	3.83E-03	1.71E-03
Zinc	849	4.76	4.04E+03	0	0	1.30	1.10E+03	0	1.24E+03	66.1	148	331	1.88E+01	8.39E+00	3.75E+00
Polychlorinated Biphenyls															
Aroclor-1016	0.0640	21.9	1.40E+00	0	0	31.1	1.99E+00	0	4.15E-01	1.50	3.35	7.50	2.77E-01	1.24E-01	5.53E-02
Aroclor-1221	0.0590	21.9	1.29E+00	0	0	31.1	1.84E+00	0	3.83E-01	1.50	3.35	7.50	2.55E-01	1.14E-01	5.10E-02
Aroclor-1232	0.0740	21.9	1.62E+00	0	0	31.1	2.30E+00	0	4.80E-01	1.50	3.35	7.50	3.20E-01	1.43E-01	6.40E-02
Aroclor-1242	0.0540	21.9	1.18E+00	0	0	31.1	1.68E+00	0	3.50E-01	1.50	3.35	7.50	2.33E-01	1.04E-01	4.67E-02
Aroclor-1248	0.0540	21.9	1.18E+00	0	0	31.1	1.68E+00	0	3.50E-01	1.50	3.35	7.50	2.33E-01	1.04E-01	4.67E-02
Aroclor-1254	0.2600	21.9	5.69E+00	0	0	31.1	8.09E+00	0	1.69E+00	1.50	3.35	7.50	1.12E+00	5.03E-01	2.25E-01
Aroclor-1260	0.0300	21.9	6.57E-01	0	0	31.1	9.33E-01	0	1.95E-01	1.50	3.35	7.50	1.30E-01	5.80E-02	2.59E-02
Pesticides															
4,4'-DDD	0.0590	7.5	4.45E-01	0	0	25.8	1.52E+00	0	1.34E-01	0.12	0.27	0.60	1.12E+00	5.00E-01	2.24E-01
4,4'-DDE	0.0940	7.5	7.08E-01	0	0	290	2.73E+01	0	2.14E-01	0.12	0.27	0.60	1.78E+00	7.97E-01	3.56E-01
4,4'-DDT	0.0032	1.37	4.40E-03	0	0	29.4	9.40E-02	0	1.50E-03	0.60	0.95	1.50	2.49E-03	1.58E-03	9.97E-04
Aldrin	0.0015	2.07	3.11E-03	0	0	30.3	4.54E-02	0	1.01E-03	0.155	0.347	0.775	6.51E-03	2.91E-03	1.30E-03
alpha-BHC	0.0074	8.6	6.37E-02	0	0	30.3	2.24E-01	0	1.92E-02	0.56	1.12	2.25	3.42E-02	1.71E-02	8.51E-03
alpha-Chlordane	0.0016	7.5	1.21E-02	0	0	43.9	7.02E-02	0	3.64E-03	0.80	1.79	4.00	4.55E-03	2.03E-03	9.10E-04
beta-BHC	0.0015	8.6	1.29E-02	0	0	30.3	4.54E-02	0	3.88E-03	0.56	1.12	2.25	6.93E-03	3.46E-03	1.73E-03
delta-BHC	0.0028	8.6	2.41E-02	0	0	30.3	8.47E-02	0	7.25E-03	0.56	1.12	2.25	1.29E-02	6.46E-03	3.22E-03
Dieldrin	0.0016	4.92	7.87E-03	0	0	91	1.45E-01	0	2.41E-03	0.071	0.52	3.78	3.40E-02	4.66E-03	6.38E-04
Endosulfan I	0.0022	0.29	6.41E-04	0	0	30.3	6.66E-02	0	3.30E-04	10.0	22.4	50.0	3.30E-05	1.47E-05	6.59E-06
Endosulfan II	0.0028	0.29	8.16E-04	0	0	30.3	8.47E-02	0	4.20E-04	10.0	22.4	50.0	4.20E-05	1.88E-05	8.39E-06
Endrin	0.0026	2.40	6.25E-03	0	0	30.3	7.87E-02	0	2.00E-03	0.30	0.67	1.50	6.67E-03	2.98E-03	1.33E-03
gamma-BHC (Lindane)	0.0020	7.8	1.57E-02	0	0	30.3	6.05E-02	0	4.72E-03	4.00	8.9	20.0	1.18E-03	5.28E-04	2.36E-04
gamma-Chlordane	0.0017	10.6	1.81E-02	0	0	33.7	5.72E-02	0	5.41E-03	0.80	1.79	4.00	6.76E-03	3.02E-03	1.35E-03
Heptachlor	0.0020	0.30	6.01E-04	0	0	30.3	6.05E-02	0	3.05E-04	0.48	1.07	2.40	6.36E-04	2.84E-04	1.27E-04
Heptachlor epoxide	0.0015	1.49	2.24E-03	0	0	30.3	4.54E-02	0	7.53E-04	0.48	1.07	2.40	1.57E-03	7.01E-04	3.14E-04
Methoxychlor	0.0027	1.00	2.70E-03	0	0	30.3	8.17E-02	0	9.66E-04	355	794	1,775	2.72E-06	1.22E-06	5.44E-07
Toxaphene	0.2500	1.00	2.50E-01	0	0	30.3	7.57E+00	0	8.94E-02	1.00	2.24	5.00	8.94E-02	4.00E-02	1.79E-02
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0041	1.00	4.10E-03	0	0	1.00	4.10E-03	0	1.47E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0044	0.48	2.12E-03	0	0	2.94	1.29E-02	0	9.05E-04	32.2	71.9	161	2.82E-05	1.26E-05	5.63E-06
1,2-Dichlorobenzene	0.0039	1.00	3.90E-03	0	0	1.88	7.34E-03	0	1.40E-03	32.2	71.9	161	4.34E-05	1.94E-05	8.68E-06

ATTACHMENT TABLE C-2
Summary of Spotted Sandpiper Exposure Doses - Screening (Step 2)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
1,3-Dichlorobenzene	0.0032	1.00	3.20E-03	0	0	0.34	1.08E-03	0	1.14E-03	32.2	71.9	161	3.56E-05	1.59E-05	7.12E-06
1,4-Dichlorobenzene	0.0046	1.00	4.60E-03	0	0	0.24	1.08E-03	0	1.65E-03	32.2	71.9	161	5.12E-05	2.29E-05	1.02E-05
Acenaphthene	0.0119	17.6	2.09E-01	0	0	0.72	8.57E-03	0	6.20E-02	7.10	15.9	35.5	8.74E-03	3.91E-03	1.75E-03
Acenaphthylene	0.0200	17.6	3.51E-01	0	0	0.45	8.93E-03	0	1.04E-01	7.10	15.9	35.5	1.47E-02	6.57E-03	2.94E-03
Anthracene	0.0282	5.29	1.49E-01	0	0	0.22	6.22E-03	0	4.56E-02	7.10	15.9	35.5	6.42E-03	2.87E-03	1.28E-03
Benzo(a)anthracene	0.1020	1.80	1.83E-01	0	0	0.52	5.32E-02	0	6.03E-02	7.10	15.9	35.5	8.50E-03	3.80E-03	1.70E-03
Benzo(a)pyrene	0.1100	6.06	6.67E-01	0	0	0.06	6.54E-03	0	2.03E-01	7.10	15.9	35.5	2.85E-02	1.28E-02	5.71E-03
Benzo(b)fluoranthene	0.1600	2.15	3.44E-01	0	0	0.07	1.06E-02	0	1.11E-01	7.10	15.9	35.5	1.57E-02	7.01E-03	3.13E-03
Benzo(g,h,i)perylene	0.0622	1.30	8.09E-02	0	0	0.95	5.93E-02	0	2.77E-02	7.10	15.9	35.5	3.90E-03	1.75E-03	7.81E-04
Benzo(k)fluoranthene	0.0634	1.84	1.17E-01	0	0	0.06	3.88E-03	0	3.83E-02	7.10	15.9	35.5	5.40E-03	2.41E-03	1.08E-03
Chrysene	0.0924	2.14	1.98E-01	0	0	0.38	3.47E-02	0	6.40E-02	7.10	15.9	35.5	9.02E-03	4.03E-03	1.80E-03
Dibenz(a,h)anthracene	0.0456	17.2	7.85E-01	0	0	0.06	2.78E-03	0	2.33E-01	7.10	15.9	35.5	3.28E-02	1.47E-02	6.57E-03
Fluoranthene	0.1220	1.48	1.81E-01	0	0	0.16	1.97E-02	0	6.09E-02	7.10	15.9	35.5	8.58E-03	3.84E-03	1.72E-03
Fluorene	0.0116	7.6	8.83E-02	0	0	2.09	2.43E-02	0	2.67E-02	7.10	15.9	35.5	3.75E-03	1.68E-03	7.51E-04
Indeno(1,2,3-cd)pyrene	0.0614	1.05	6.43E-02	0	0	0.67	4.13E-02	0	2.28E-02	7.10	15.9	35.5	3.21E-03	1.44E-03	6.43E-04
Phenanthrene	0.1110	2.45	2.72E-01	0	0	1.05	1.17E-01	0	8.69E-02	7.10	15.9	35.5	1.22E-02	5.47E-03	2.45E-03
Pyrene	0.1250	13.1	1.64E+00	0	0	0.78	9.71E-02	0	4.89E-01	7.10	15.9	35.5	6.89E-02	3.08E-02	1.38E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI =	Chemical-specific	= Dietary intake for chemical (mg chemical/kg body weight/day)
FIR =	0.0105	= Food ingestion rate (kg/day dry weight)
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic invertebrates, dry weight basis
PDFi =	0.820	= Proportion of diet composed of food item (aquatic invertebrates)
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic plants, dry weight basis
PDFi =	0.000	= Proportion of diet composed of food item (aquatic plants)
FCxi =	Chemical-specific	= Concentration of chemical in food item (fish, dry weight basis)
PDFi =	0.000	= Proportion of diet composed of food item (fish)
SCx =	Chemical-specific	= Concentration of chemical in sediment (mg/kg, dry weight)
PDS =	0.180	= Proportion of diet composed of sediment
WIR =	0.0089	= Water ingestion rate (L/day)
WC =	Chemical-specific	= Concentration of chemical in water (mg/L)
BW =	0.0294	= Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

ATTACHMENT TABLE C-3
Summary of Fishing Bat Exposure Doses - Screening (Step 2)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	7.80	0.69	5.38E+00	0	0	0.126	9.83E-01	0	2.19E-01	0.252	0.56	1.26	8.67E-01	3.88E-01	1.73E-01
Cadmium	5.69	3.07	1.75E+01	0	0	0.220	1.25E+00	0	2.78E-01	0.77	2.43	7.70	3.61E-01	1.14E-01	3.61E-02
Chromium	37.0	0.47	1.73E+01	0	0	0.038	1.41E+00	0	3.13E-01	2.40	5.37	12.0	1.30E-01	5.83E-02	2.61E-02
Copper	204	7.96	1.62E+03	0	0	0.100	2.04E+01	0	4.54E+00	5.60	7.23	9.34	8.10E-01	6.27E-01	4.86E-01
Lead	612	0.33	2.00E+02	0	0	0.130	7.96E+01	0	1.77E+01	4.70	6.47	8.90	3.76E+00	2.74E+00	1.99E+00
Mercury	0.13	2.87	3.70E-01	0	0	4.58	5.91E-01	0	1.31E-01	0.032	0.072	0.16	4.11E+00	1.84E+00	8.21E-01
Nickel	19.1	0.21	4.09E+00	0	0	1.00	1.91E+01	0	4.25E+00	1.70	2.40	3.40	2.50E+00	1.77E+00	1.25E+00
Selenium	1.40	5.55	7.77E+00	0	0	1.00	1.40E+00	0	3.11E-01	0.20	0.26	0.33	1.56E+00	1.21E+00	9.43E-01
Silver	0.30	0.18	5.31E-02	0	0	1.00	2.95E-01	0	6.56E-02	12.0	26.9	60.2	5.45E-03	2.44E-03	1.09E-03
Zinc	849	4.76	4.04E+03	0	0	1.30	1.10E+03	0	2.45E+02	75.4	169	377	3.25E+00	1.46E+00	6.51E-01
Polychlorinated Biphenyls															
Aroclor-1016	0.0640	21.9	1.40E+00	0	0	31.1	1.99E+00	0	4.43E-01	0.136	0.30	0.68	3.25E+00	1.46E+00	6.51E-01
Aroclor-1221	0.0590	21.9	1.29E+00	0	0	31.1	1.84E+00	0	4.08E-01	0.136	0.30	0.68	3.00E+00	1.34E+00	6.00E-01
Aroclor-1232	0.0740	21.9	1.62E+00	0	0	31.1	2.30E+00	0	5.12E-01	0.136	0.30	0.68	3.76E+00	1.68E+00	7.53E-01
Aroclor-1242	0.0540	21.9	1.18E+00	0	0	31.1	1.68E+00	0	3.73E-01	0.136	0.30	0.68	2.75E+00	1.23E+00	5.49E-01
Aroclor-1248	0.0540	21.9	1.18E+00	0	0	31.1	1.68E+00	0	3.73E-01	0.136	0.30	0.68	2.75E+00	1.23E+00	5.49E-01
Aroclor-1254	0.2600	21.9	5.69E+00	0	0	31.1	8.09E+00	0	1.80E+00	0.136	0.30	0.68	1.32E+01	5.91E+00	2.64E+00
Aroclor-1260	0.0300	21.9	6.57E-01	0	0	31.1	9.33E-01	0	2.07E-01	0.136	0.30	0.68	1.53E+00	6.82E-01	3.05E-01
Pesticides															
4,4'-DDD	0.0590	7.5	4.45E-01	0	0	25.8	1.52E+00	0	3.39E-01	0.147	0.329	0.735	2.31E+00	1.03E+00	4.61E-01
4,4'-DDE	0.0940	7.5	7.08E-01	0	0	290	2.73E+01	0	6.07E+00	0.147	0.329	0.735	4.13E+01	1.85E+01	8.26E+00
4,4'-DDT	0.0032	1.37	4.40E-03	0	0	29.4	9.40E-02	0	2.09E-02	0.147	0.329	0.735	1.42E-01	6.36E-02	2.84E-02
Aldrin	0.0015	2.07	3.11E-03	0	0	30.3	4.54E-02	0	1.01E-02	0.20	0.45	1.00	5.05E-02	2.26E-02	1.01E-02
alpha-BHC	0.0074	8.6	6.37E-02	0	0	30.3	2.24E-01	0	4.98E-02	1.60	2.26	3.20	3.11E-02	2.20E-02	1.56E-02
alpha-Chlordane	0.0016	7.5	1.21E-02	0	0	43.9	7.02E-02	0	1.56E-02	4.58	6.48	9.16	3.41E-03	2.41E-03	1.71E-03
beta-BHC	0.0015	8.6	1.29E-02	0	0	30.3	4.54E-02	0	1.01E-02	1.60	2.26	3.20	6.31E-03	4.46E-03	3.15E-03
delta-BHC	0.0028	8.6	2.41E-02	0	0	30.3	8.47E-02	0	1.88E-02	1.60	2.26	3.20	1.18E-02	8.33E-03	5.89E-03
Dieldrin	0.0016	4.92	7.87E-03	0	0	91	1.45E-01	0	3.23E-02	0.015	0.021	0.030	2.15E+00	1.52E+00	1.08E+00
Endosulfan I	0.0022	0.29	6.41E-04	0	0	30.3	6.66E-02	0	1.48E-02	0.15	0.34	0.75	9.87E-02	4.41E-02	1.97E-02
Endosulfan II	0.0028	0.29	8.16E-04	0	0	30.3	8.47E-02	0	1.88E-02	0.15	0.34	0.75	1.26E-01	5.62E-02	2.51E-02
Endrin	0.0026	2.40	6.25E-03	0	0	30.3	7.87E-02	0	1.75E-02	0.18	0.41	0.92	9.51E-02	4.25E-02	1.90E-02
gamma-BHC (Lindane)	0.0020	7.8	1.57E-02	0	0	30.3	6.05E-02	0	1.35E-02	8.00	17.9	40.0	1.68E-03	7.52E-04	3.36E-04
gamma-Chlordane	0.0017	10.6	1.81E-02	0	0	33.7	5.72E-02	0	1.27E-02	4.58	6.48	9.16	2.78E-03	1.96E-03	1.39E-03
Heptachlor	0.0020	0.30	6.01E-04	0	0	30.3	6.05E-02	0	1.35E-02	0.20	0.45	1.00	6.73E-02	3.01E-02	1.35E-02
Heptachlor epoxide	0.0015	1.49	2.24E-03	0	0	30.3	4.54E-02	0	1.01E-02	0.20	0.45	1.00	5.05E-02	2.26E-02	1.01E-02
Methoxychlor	0.0027	1.00	2.70E-03	0	0	30.3	8.17E-02	0	1.82E-02	4.00	5.66	8.00	4.54E-03	3.21E-03	2.27E-03
Toxaphene	0.2500	1.00	2.50E-01	0	0	30.3	7.57E+00	0	1.68E+00	8.00	17.9	40.0	2.10E-01	9.40E-02	4.21E-02
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0041	1.00	4.10E-03	0	0	1.00	4.10E-03	0	9.12E-04	76.0	170	380	1.20E-05	5.36E-06	2.40E-06
1,2,4-Trichlorobenzene	0.0044	0.48	2.12E-03	0	0	2.94	1.29E-02	0	2.88E-03	53.0	75.0	106	5.43E-05	3.84E-05	2.72E-05
1,2-Dichlorobenzene	0.0039	1.00	3.90E-03	0	0	1.88	7.34E-03	0	1.63E-03	85.7	192	429	1.91E-05	8.52E-06	3.81E-06

ATTACHMENT TABLE C-3
Summary of Fishing Bat Exposure Doses - Screening (Step 2)
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
1,3-Dichlorobenzene	0.0032	1.00	3.20E-03	0	0	0.34	1.08E-03	0	2.39E-04	85.7	192	429	2.79E-06	1.25E-06	5.58E-07
1,4-Dichlorobenzene	0.0046	1.00	4.60E-03	0	0	0.24	1.08E-03	0	2.41E-04	30.0	52.0	90.0	8.02E-06	4.63E-06	2.67E-06
Acenaphthene	0.0119	17.6	2.09E-01	0	0	0.72	8.57E-03	0	1.91E-03	65.6	147	328	2.91E-05	1.30E-05	5.81E-06
Acenaphthylene	0.0200	17.6	3.51E-01	0	0	0.45	8.93E-03	0	1.99E-03	65.6	147	328	3.03E-05	1.35E-05	6.05E-06
Anthracene	0.0282	5.29	1.49E-01	0	0	0.22	6.22E-03	0	1.38E-03	65.6	147	328	2.11E-05	9.43E-06	4.22E-06
Benzo(a)anthracene	0.1020	1.80	1.83E-01	0	0	0.52	5.32E-02	0	1.18E-02	0.62	1.37	3.07	1.92E-02	8.61E-03	3.85E-03
Benzo(a)pyrene	0.1100	6.06	6.67E-01	0	0	0.06	6.54E-03	0	1.45E-03	0.62	1.37	3.07	2.36E-03	1.06E-03	4.73E-04
Benzo(b)fluoranthene	0.1600	2.15	3.44E-01	0	0	0.07	1.06E-02	0	2.36E-03	0.62	1.37	3.07	3.84E-03	1.72E-03	7.69E-04
Benzo(g,h,i)perylene	0.0622	1.30	8.09E-02	0	0	0.95	5.93E-02	0	1.32E-02	0.62	1.37	3.07	2.14E-02	9.60E-03	4.30E-03
Benzo(k)fluoranthene	0.0634	1.84	1.17E-01	0	0	0.06	3.88E-03	0	8.63E-04	0.62	1.37	3.07	1.40E-03	6.28E-04	2.81E-04
Chrysene	0.0924	2.14	1.98E-01	0	0	0.38	3.47E-02	0	7.71E-03	0.62	1.37	3.07	1.25E-02	5.61E-03	2.51E-03
Dibenz(a,h)anthracene	0.0456	17.2	7.85E-01	0	0	0.06	2.78E-03	0	6.19E-04	0.62	1.37	3.07	1.01E-03	4.51E-04	2.02E-04
Fluoranthene	0.1220	1.48	1.81E-01	0	0	0.16	1.97E-02	0	4.39E-03	65.6	147	328	6.69E-05	2.99E-05	1.34E-05
Fluorene	0.0116	7.6	8.83E-02	0	0	2.09	2.43E-02	0	5.39E-03	65.6	147	328	8.22E-05	3.68E-05	1.64E-05
Indeno(1,2,3-cd)pyrene	0.0614	1.05	6.43E-02	0	0	0.67	4.13E-02	0	9.17E-03	0.62	1.37	3.07	1.49E-02	6.68E-03	2.99E-03
Phenanthrene	0.1110	2.45	2.72E-01	0	0	1.05	1.17E-01	0	2.59E-02	65.6	147	328	3.95E-04	1.77E-04	7.90E-05
Pyrene	0.1250	13.1	1.64E+00	0	0	0.78	9.71E-02	0	2.16E-02	0.62	1.37	3.07	3.51E-02	1.57E-02	7.03E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI =	Chemical-specific	= Dietary intake for chemical (mg chemical/kg body weight/day)	
FIR =	0.0070	= Food ingestion rate (kg/day dry weight)	
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic invertebrates, dry weight basis	
PDFi =	0.000	= Proportion of diet composed of food item (aquatic invertebrates)	
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic plants, dry weight basis	
PDFi =	0.000	= Proportion of diet composed of food item (aquatic plants)	
FCxi =	Chemical-specific	= Concentration of chemical in food item (fish, dry weight basis)	
PDFi =	1.000	= Proportion of diet composed of food item (fish)	
SCx =	Chemical-specific	= Concentration of chemical in sediment (mg/kg, dry weight)	
PDS =	0.000	= Proportion of diet composed of sediment	
WIR =	0.0103	= Water ingestion rate (L/day)	
WC =	Chemical-specific	= Concentration of chemical in water (mg/L)	
BW =	0.0314	= Body weight (kg)	

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

ATTACHMENT TABLE C-4
Summary of Green Heron Exposure Doses - Baseline (Step 3A) - 95% UCL
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Cadmium	3.46	Regression	9.17E-01	0	0	0.220	7.61E-01	0	9.90E-02	1.47	3.29	7.35	6.73E-02	3.01E-02	1.35E-02
Chromium	22.0	Regression	5.01E+00	0	0	0.038	8.37E-01	0	2.51E-01	2.66	5.95	13.3	9.45E-02	4.22E-02	1.89E-02
Copper	121	0.824	9.97E+01	0	0	0.100	1.21E+01	0	4.60E+00	4.05	7.00	12.1	1.14E+00	6.58E-01	3.80E-01
Lead	348	Regression	1.40E+01	0	0	0.130	4.53E+01	0	4.44E+00	3.85	8.61	19.3	1.15E+00	5.16E-01	2.31E-01
Mercury	0.081	1.186	9.66E-02	0	0	3.25	2.65E-01	0	2.65E-02	0.026	0.045	0.078	1.02E+00	5.89E-01	3.40E-01
Nickel	12.0	Regression	2.04E+00	0	0	1.00	1.20E+01	0	1.12E+00	6.71	15.0	33.6	1.66E-01	7.44E-02	3.33E-02
Selenium	0.50	5.550	2.76E+00	0	0	1.00	4.98E-01	0	1.42E-01	1.80	4.02	9.00	7.88E-02	3.52E-02	1.58E-02
Zinc	455	Regression	1.68E+02	0	0	1.30	5.91E+02	0	5.75E+01	66.1	148	331	8.70E-01	3.89E-01	1.74E-01
Polychlorinated Biphenyls															
Aroclor-1016	0.0232	Regression	5.97E-02	0	0	31.1	7.22E-01	0	6.51E-02	1.50	3.35	7.50	4.34E-02	1.94E-02	8.68E-03
Aroclor-1221	0.0214	Regression	5.46E-02	0	0	31.1	6.67E-01	0	6.01E-02	1.50	3.35	7.50	4.00E-02	1.79E-02	8.01E-03
Aroclor-1232	0.0269	Regression	7.04E-02	0	0	31.1	8.37E-01	0	7.55E-02	1.50	3.35	7.50	5.03E-02	2.25E-02	1.01E-02
Aroclor-1242	0.0196	Regression	4.96E-02	0	0	31.1	6.11E-01	0	5.50E-02	1.50	3.35	7.50	3.67E-02	1.64E-02	7.34E-03
Aroclor-1248	0.0196	Regression	4.96E-02	0	0	31.1	6.11E-01	0	5.50E-02	1.50	3.35	7.50	3.67E-02	1.64E-02	7.34E-03
Aroclor-1254	0.1318	Regression	4.10E-01	0	0	31.1	4.10E+00	0	3.72E-01	1.50	3.35	7.50	2.48E-01	1.11E-01	4.96E-02
Aroclor-1260	0.0109	Regression	2.59E-02	0	0	31.1	3.40E-01	0	3.06E-02	1.50	3.35	7.50	2.04E-02	9.11E-03	4.08E-03
Pesticides															
4,4'-DDD	0.0292	7.5	2.20E-01	0	0	12.4	3.62E-01	0	3.94E-02	0.30	0.95	3.00	1.31E-01	4.16E-02	1.31E-02
4,4'-DDE	0.0499	7.5	3.76E-01	0	0	20.4	1.02E+00	0	1.02E-01	0.30	0.95	3.00	3.41E-01	1.08E-01	3.41E-02
Dieldrin	0.0006	4.92	2.84E-03	0	0	12.9	7.46E-03	0	7.51E-04	0.071	0.52	3.78	1.06E-02	1.45E-03	1.99E-04
Toxaphene	0.0908	1.00	9.08E-02	0	0	30.3	2.75E+00	0	2.43E-01	1.00	2.24	5.00	2.43E-01	1.09E-01	4.85E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI =	Chemical-specific	= Dietary intake for chemical (mg chemical/kg body weight/day)	
FIR =	0.0230	= Food ingestion rate (kg/day dry weight)	
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic invertebrates, dry weight basis	
PDFi =	0.290	= Proportion of diet composed of food item (aquatic invertebrates)	
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic plants, dry weight basis	
PDFi =	0.000	= Proportion of diet composed of food item (aquatic plants)	
FCxi =	Chemical-specific	= Concentration of chemical in food item (fish, dry weight basis)	
PDFi =	0.710	= Proportion of diet composed of food item (fish)	
SCx =	Chemical-specific	= Concentration of chemical in sediment (mg/kg, dry weight)	
PDS =	0.000	= Proportion of diet composed of sediment	
WIR =	0.0192	= Water ingestion rate (L/day)	
WC =	Chemical-specific	= Concentration of chemical in water (mg/L)	
BW =	0.187	= Body weight (kg)	

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

ATTACHMENT TABLE C-5
Summary of Spotted Sandpiper Exposure Doses - Baseline (Step 3A) - 95% UCL
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Cadmium	3.46	Regression	9.17E-01	0	0	0.220	7.61E-01	0	2.74E-01	1.47	3.29	7.35	1.86E-01	8.32E-02	3.72E-02
Chromium	22.0	Regression	5.01E+00	0	0	0.038	8.37E-01	0	1.61E+00	2.66	5.95	13.3	6.04E-01	2.70E-01	1.21E-01
Copper	121	0.824	9.97E+01	0	0	0.100	1.21E+01	0	2.06E+01	4.05	7.00	12.1	5.08E+00	2.94E+00	1.70E+00
Lead	348	Regression	1.40E+01	0	0	0.130	4.53E+01	0	1.47E+01	3.85	8.61	19.3	3.83E+00	1.71E+00	7.66E-01
Mercury	0.081	1.186	9.66E-02	0	0	3.25	2.65E-01	0	1.87E-02	0.026	0.045	0.078	7.19E-01	4.15E-01	2.40E-01
Nickel	12.0	Regression	2.04E+00	0	0	1.00	1.20E+01	0	7.61E-01	6.71	15.0	33.6	1.13E-01	5.07E-02	2.27E-02
Selenium	0.50	5.550	2.76E+00	0	0	1.00	4.98E-01	0	4.69E-01	0.40	0.57	0.80	1.17E+00	8.28E-01	5.86E-01
Zinc	455	Regression	1.68E+02	0	0	1.30	5.91E+02	0	4.37E+01	66.1	148	331	6.61E-01	2.95E-01	1.32E-01
Polychlorinated Biphenyls															
Aroclor-1016	0.0232	Regression	5.97E-02	0	0	31.1	7.22E-01	0	1.06E-02	1.50	3.35	7.50	7.05E-03	3.15E-03	1.41E-03
Aroclor-1221	0.0214	Regression	5.46E-02	0	0	31.1	6.67E-01	0	9.68E-03	1.50	3.35	7.50	6.45E-03	2.89E-03	1.29E-03
Aroclor-1232	0.0269	Regression	7.04E-02	0	0	31.1	8.37E-01	0	1.24E-02	1.50	3.35	7.50	8.30E-03	3.71E-03	1.66E-03
Aroclor-1242	0.0196	Regression	4.96E-02	0	0	31.1	6.11E-01	0	8.80E-03	1.50	3.35	7.50	5.87E-03	2.62E-03	1.17E-03
Aroclor-1248	0.0196	Regression	4.96E-02	0	0	31.1	6.11E-01	0	8.80E-03	1.50	3.35	7.50	5.87E-03	2.62E-03	1.17E-03
Aroclor-1254	0.1318	Regression	4.10E-01	0	0	31.1	4.10E+00	0	7.17E-02	1.50	3.35	7.50	4.78E-02	2.14E-02	9.56E-03
Aroclor-1260	0.0109	Regression	2.59E-02	0	0	31.1	3.40E-01	0	4.61E-03	1.50	3.35	7.50	3.08E-03	1.38E-03	6.15E-04
Pesticides															
4,4'-DDD	0.0292	7.5	2.20E-01	0	0	12.4	3.62E-01	0	3.69E-02	0.12	0.27	0.60	3.08E-01	1.38E-01	6.16E-02
4,4'-DDE	0.0499	7.5	3.76E-01	0	0	20.4	1.02E+00	0	6.32E-02	0.12	0.27	0.60	5.26E-01	2.35E-01	1.05E-01
Dieldrin	0.0006	4.92	2.84E-03	0	0	12.9	7.46E-03	0	4.85E-04	0.071	0.52	3.78	6.84E-03	9.37E-04	1.28E-04
Toxaphene	0.0908	1.00	9.08E-02	0	0	30.3	2.75E+00	0	1.81E-02	1.00	2.24	5.00	1.81E-02	8.08E-03	3.61E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0080 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.820 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.180 = Proportion of diet composed of sediment
WIR = 0.0069 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0404 = Body weight (kg)

ATTACHMENT TABLE C-6
Summary of Fishing Bat Exposure Doses - Baseline (Step 3A) - 95% UCL
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Cadmium	3.46	Regression	9.17E-01	0	0	0.220	7.61E-01	0	7.46E-02	0.77	2.43	7.70	9.68E-02	3.06E-02	9.68E-03
Chromium	22.0	Regression	5.01E+00	0	0	0.038	8.37E-01	0	8.21E-02	2.40	5.37	12.0	3.42E-02	1.53E-02	6.84E-03
Copper	121	0.824	9.97E+01	0	0	0.100	1.21E+01	0	1.19E+00	5.60	7.23	9.34	2.12E-01	1.64E-01	1.27E-01
Lead	348	Regression	1.40E+01	0	0	0.130	4.53E+01	0	4.44E+00	4.70	6.47	8.90	9.44E-01	6.86E-01	4.98E-01
Mercury	0.081	1.186	9.66E-02	0	0	3.25	2.65E-01	0	2.60E-02	0.032	0.072	0.16	8.11E-01	3.63E-01	1.62E-01
Nickel	12.0	Regression	2.04E+00	0	0	1.00	1.20E+01	0	1.17E+00	1.70	2.40	3.40	6.90E-01	4.88E-01	3.45E-01
Selenium	0.50	5.550	2.76E+00	0	0	1.00	4.98E-01	0	4.88E-02	0.20	0.26	0.33	2.44E-01	1.90E-01	1.48E-01
Zinc	455	Regression	1.68E+02	0	0	1.30	5.91E+02	0	5.79E+01	75.4	169	377	7.68E-01	3.44E-01	1.54E-01
Polychlorinated Biphenyls															
Aroclor-1016	0.0232	Regression	5.97E-02	0	0	31.1	7.22E-01	0	7.08E-02	0.136	0.30	0.68	5.21E-01	2.33E-01	1.04E-01
Aroclor-1221	0.0214	Regression	5.46E-02	0	0	31.1	6.67E-01	0	6.53E-02	0.136	0.30	0.68	4.80E-01	2.15E-01	9.61E-02
Aroclor-1232	0.0269	Regression	7.04E-02	0	0	31.1	8.37E-01	0	8.21E-02	0.136	0.30	0.68	6.03E-01	2.70E-01	1.21E-01
Aroclor-1242	0.0196	Regression	4.96E-02	0	0	31.1	6.11E-01	0	5.99E-02	0.136	0.30	0.68	4.40E-01	1.97E-01	8.81E-02
Aroclor-1248	0.0196	Regression	4.96E-02	0	0	31.1	6.11E-01	0	5.99E-02	0.136	0.30	0.68	4.40E-01	1.97E-01	8.81E-02
Aroclor-1254	0.1318	Regression	4.10E-01	0	0	31.1	4.10E+00	0	4.02E-01	0.136	0.30	0.68	2.95E+00	1.32E+00	5.91E-01
Aroclor-1260	0.0109	Regression	2.59E-02	0	0	31.1	3.40E-01	0	3.33E-02	0.136	0.30	0.68	2.45E-01	1.10E-01	4.90E-02
Pesticides															
4,4'-DDD	0.0292	7.5	2.20E-01	0	0	12.4	3.62E-01	0	3.55E-02	0.147	0.329	0.735	2.42E-01	1.08E-01	4.83E-02
4,4'-DDE	0.0499	7.5	3.76E-01	0	0	20.4	1.02E+00	0	1.00E-01	0.147	0.329	0.735	6.80E-01	3.04E-01	1.36E-01
Dieldrin	0.0006	4.92	2.84E-03	0	0	12.9	7.46E-03	0	7.31E-04	0.015	0.021	0.030	4.87E-02	3.45E-02	2.44E-02
Toxaphene	0.0908	1.00	9.08E-02	0	0	30.3	2.75E+00	0	2.69E-01	8.00	17.9	40.0	3.36E-02	1.50E-02	6.73E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0053 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0072 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0544 = Body weight (kg)

ATTACHMENT TABLE C-7
Summary of Green Heron Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Cadmium	2.31	Regression	7.46E-01	0	0	0.220	5.09E-01	0	7.09E-02	1.47	3.29	7.35	4.83E-02	2.16E-02	9.65E-03
Chromium	15.2	Regression	4.37E+00	0	0	0.038	5.76E-01	0	2.06E-01	2.66	5.95	13.3	7.73E-02	3.46E-02	1.55E-02
Copper	77.1	0.824	6.35E+01	0	0	0.100	7.71E+00	0	2.93E+00	4.05	7.00	12.1	7.24E-01	4.19E-01	2.42E-01
Lead	205	Regression	9.88E+00	0	0	0.130	2.67E+01	0	2.68E+00	3.85	8.61	19.3	6.96E-01	3.11E-01	1.39E-01
Mercury	0.055	1.186	6.56E-02	0	0	3.25	1.80E-01	0	1.80E-02	0.026	0.045	0.078	6.93E-01	4.00E-01	2.31E-01
Nickel	8.17	Regression	1.56E+00	0	0	1.00	8.17E+00	0	7.68E-01	6.71	15.0	33.6	1.14E-01	5.12E-02	2.29E-02
Selenium	0.40	5.550	2.21E+00	0	0	1.00	3.98E-01	0	1.13E-01	1.80	4.02	9.00	6.30E-02	2.82E-02	1.26E-02
Zinc	274	Regression	1.57E+02	0	0	1.30	3.57E+02	0	3.67E+01	66.1	148	331	5.55E-01	2.48E-01	1.11E-01
Polychlorinated Biphenyls															
Aroclor-1016	0.0195	Regression	4.92E-02	0	0	31.1	6.07E-01	0	5.46E-02	1.50	3.35	7.50	3.64E-02	1.63E-02	7.28E-03
Aroclor-1221	0.0180	Regression	4.50E-02	0	0	31.1	5.60E-01	0	5.04E-02	1.50	3.35	7.50	3.36E-02	1.50E-02	6.72E-03
Aroclor-1232	0.0226	Regression	5.80E-02	0	0	31.1	7.04E-01	0	6.34E-02	1.50	3.35	7.50	4.23E-02	1.89E-02	8.46E-03
Aroclor-1242	0.0165	Regression	4.09E-02	0	0	31.1	5.13E-01	0	4.62E-02	1.50	3.35	7.50	3.08E-02	1.38E-02	6.16E-03
Aroclor-1248	0.0165	Regression	4.09E-02	0	0	31.1	5.13E-01	0	4.62E-02	1.50	3.35	7.50	3.08E-02	1.38E-02	6.16E-03
Aroclor-1254	0.0711	Regression	2.07E-01	0	0	31.1	2.21E+00	0	2.00E-01	1.50	3.35	7.50	1.33E-01	5.97E-02	2.67E-02
Aroclor-1260	0.0092	Regression	2.13E-02	0	0	31.1	2.86E-01	0	2.57E-02	1.50	3.35	7.50	1.71E-02	7.65E-03	3.42E-03
Pesticides															
4,4'-DDD	0.0152	7.5	1.15E-01	0	0	12.4	1.89E-01	0	2.06E-02	0.30	0.95	3.00	6.86E-02	2.17E-02	6.86E-03
4,4'-DDE	0.0265	7.5	2.00E-01	0	0	20.4	5.42E-01	0	5.44E-02	0.30	0.95	3.00	1.81E-01	5.73E-02	1.81E-02
Dieldrin	0.0005	4.92	2.27E-03	0	0	12.9	5.95E-03	0	5.99E-04	0.071	0.52	3.78	8.46E-03	1.16E-03	1.59E-04
Toxaphene	0.0725	1.00	7.25E-02	0	0	30.3	2.19E+00	0	1.94E-01	1.00	2.24	5.00	1.94E-01	8.67E-02	3.88E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0230 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.290 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.710 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0192 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.187 = Body weight (kg)

ATTACHMENT TABLE C-8
Summary of Spotted Sandpiper Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Cadmium	2.31	Regression	7.46E-01	0	0	0.220	5.09E-01	0	2.05E-01	1.47	3.29	7.35	1.39E-01	6.23E-02	2.78E-02
Chromium	15.2	Regression	4.37E+00	0	0	0.038	5.76E-01	0	1.25E+00	2.66	5.95	13.3	4.72E-01	2.11E-01	9.44E-02
Copper	77.1	0.824	6.35E+01	0	0	0.100	7.71E+00	0	1.31E+01	4.05	7.00	12.1	3.24E+00	1.87E+00	1.08E+00
Lead	205	Regression	9.88E+00	0	0	0.130	2.67E+01	0	8.96E+00	3.85	8.61	19.3	2.33E+00	1.04E+00	4.66E-01
Mercury	0.055	1.186	6.56E-02	0	0	3.25	1.80E-01	0	1.27E-02	0.026	0.045	0.078	4.88E-01	2.82E-01	1.63E-01
Nickel	8.17	Regression	1.56E+00	0	0	1.00	8.17E+00	0	5.47E-01	6.71	15.0	33.6	8.16E-02	3.65E-02	1.63E-02
Selenium	0.40	5.550	2.21E+00	0	0	1.00	3.98E-01	0	3.75E-01	0.40	0.57	0.80	9.37E-01	6.63E-01	4.68E-01
Zinc	274	Regression	1.57E+02	0	0	1.30	3.57E+02	0	3.55E+01	66.1	148	331	5.37E-01	2.40E-01	1.07E-01
Polychlorinated Biphenyls															
Aroclor-1016	0.0195	Regression	4.92E-02	0	0	31.1	6.07E-01	0	8.73E-03	1.50	3.35	7.50	5.82E-03	2.60E-03	1.16E-03
Aroclor-1221	0.0180	Regression	4.50E-02	0	0	31.1	5.60E-01	0	7.99E-03	1.50	3.35	7.50	5.33E-03	2.38E-03	1.07E-03
Aroclor-1232	0.0226	Regression	5.80E-02	0	0	31.1	7.04E-01	0	1.03E-02	1.50	3.35	7.50	6.85E-03	3.06E-03	1.37E-03
Aroclor-1242	0.0165	Regression	4.09E-02	0	0	31.1	5.13E-01	0	7.26E-03	1.50	3.35	7.50	4.84E-03	2.16E-03	9.68E-04
Aroclor-1248	0.0165	Regression	4.09E-02	0	0	31.1	5.13E-01	0	7.26E-03	1.50	3.35	7.50	4.84E-03	2.16E-03	9.68E-04
Aroclor-1254	0.0711	Regression	2.07E-01	0	0	31.1	2.21E+00	0	3.63E-02	1.50	3.35	7.50	2.42E-02	1.08E-02	4.84E-03
Aroclor-1260	0.0092	Regression	2.13E-02	0	0	31.1	2.86E-01	0	3.81E-03	1.50	3.35	7.50	2.54E-03	1.14E-03	5.08E-04
Pesticides															
4,4'-DDD	0.0152	7.5	1.15E-01	0	0	12.4	1.89E-01	0	1.93E-02	0.12	0.27	0.60	1.61E-01	7.19E-02	3.21E-02
4,4'-DDE	0.0265	7.5	2.00E-01	0	0	20.4	5.42E-01	0	3.36E-02	0.12	0.27	0.60	2.80E-01	1.25E-01	5.60E-02
Dieldrin	0.0005	4.92	2.27E-03	0	0	12.9	5.95E-03	0	3.87E-04	0.071	0.52	3.78	5.46E-03	7.47E-04	1.02E-04
Toxaphene	0.0725	1.00	7.25E-02	0	0	30.3	2.19E+00	0	1.44E-02	1.00	2.24	5.00	1.44E-02	6.45E-03	2.89E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0080 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.820 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.180 = Proportion of diet composed of sediment
WIR = 0.0069 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0404 = Body weight (kg)

ATTACHMENT TABLE C-9
Summary of Fishing Bat Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Cadmium	2.31	Regression	7.46E-01	0	0	0.220	5.09E-01	0	4.99E-02	0.77	2.43	7.70	6.48E-02	2.05E-02	6.48E-03
Chromium	15.2	Regression	4.37E+00	0	0	0.038	5.76E-01	0	5.64E-02	2.40	5.37	12.0	2.35E-02	1.05E-02	4.70E-03
Copper	77.1	0.824	6.35E+01	0	0	0.100	7.71E+00	0	7.55E-01	5.60	7.23	9.34	1.35E-01	1.04E-01	8.09E-02
Lead	205	Regression	9.88E+00	0	0	0.130	2.67E+01	0	2.61E+00	4.70	6.47	8.90	5.56E-01	4.04E-01	2.94E-01
Mercury	0.055	1.186	6.56E-02	0	0	3.25	1.80E-01	0	1.76E-02	0.032	0.072	0.16	5.51E-01	2.46E-01	1.10E-01
Nickel	8.17	Regression	1.56E+00	0	0	1.00	8.17E+00	0	8.00E-01	1.70	2.40	3.40	4.71E-01	3.33E-01	2.35E-01
Selenium	0.40	5.550	2.21E+00	0	0	1.00	3.98E-01	0	3.90E-02	0.20	0.26	0.33	1.95E-01	1.52E-01	1.18E-01
Zinc	274	Regression	1.57E+02	0	0	1.30	3.57E+02	0	3.50E+01	75.4	169	377	4.64E-01	2.07E-01	9.27E-02
Polychlorinated Biphenyls															
Aroclor-1016	0.0195	Regression	4.92E-02	0	0	31.1	6.07E-01	0	5.94E-02	0.136	0.30	0.68	4.37E-01	1.95E-01	8.74E-02
Aroclor-1221	0.0180	Regression	4.50E-02	0	0	31.1	5.60E-01	0	5.49E-02	0.136	0.30	0.68	4.03E-01	1.80E-01	8.07E-02
Aroclor-1232	0.0226	Regression	5.80E-02	0	0	31.1	7.04E-01	0	6.90E-02	0.136	0.30	0.68	5.07E-01	2.27E-01	1.01E-01
Aroclor-1242	0.0165	Regression	4.09E-02	0	0	31.1	5.13E-01	0	5.03E-02	0.136	0.30	0.68	3.70E-01	1.65E-01	7.40E-02
Aroclor-1248	0.0165	Regression	4.09E-02	0	0	31.1	5.13E-01	0	5.03E-02	0.136	0.30	0.68	3.70E-01	1.65E-01	7.40E-02
Aroclor-1254	0.0711	Regression	2.07E-01	0	0	31.1	2.21E+00	0	2.17E-01	0.136	0.30	0.68	1.59E+00	7.13E-01	3.19E-01
Aroclor-1260	0.0092	Regression	2.13E-02	0	0	31.1	2.86E-01	0	2.80E-02	0.136	0.30	0.68	2.06E-01	9.21E-02	4.12E-02
Pesticides															
4,4'-DDD	0.0152	7.5	1.15E-01	0	0	12.4	1.89E-01	0	1.85E-02	0.147	0.329	0.735	1.26E-01	5.64E-02	2.52E-02
4,4'-DDE	0.0265	7.5	2.00E-01	0	0	20.4	5.42E-01	0	5.31E-02	0.147	0.329	0.735	3.62E-01	1.62E-01	7.23E-02
Dieldrin	0.0005	4.92	2.27E-03	0	0	12.9	5.95E-03	0	5.83E-04	0.015	0.021	0.030	3.89E-02	2.75E-02	1.94E-02
Toxaphene	0.0725	1.00	7.25E-02	0	0	30.3	2.19E+00	0	2.15E-01	8.00	17.9	40.0	2.69E-02	1.20E-02	5.38E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI =	Chemical-specific	=	Dietary intake for chemical (mg chemical/kg body weight/day)
FIR =	0.0053	=	Food ingestion rate (kg/day dry weight)
FCxi =	Chemical-specific	=	Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi =	0.000	=	Proportion of diet composed of food item (aquatic invertebrates)
FCxi =	Chemical-specific	=	Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi =	0.000	=	Proportion of diet composed of food item (aquatic plants)
FCxi =	Chemical-specific	=	Concentration of chemical in food item (fish, dry weight basis)
PDFi =	1.000	=	Proportion of diet composed of food item (fish)
SCx =	Chemical-specific	=	Concentration of chemical in sediment (mg/kg, dry weight)
PDS =	0.000	=	Proportion of diet composed of sediment
WIR =	0.0072	=	Water ingestion rate (L/day)
WC =	Chemical-specific	=	Concentration of chemical in water (mg/L)
BW =	0.0544	=	Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	1.43	1.43	1.43
Percent soilds:	0.21	0.21	0.25

Attachment D
Aquatic Food Web Calculations Using Human Health Fish and Crab Tissue Data

In the ERA, chemical concentrations in aquatic prey items (benthic invertebrates and fish) were modeled from measured sediment concentrations and were not directly measured in tissue samples collected to specifically evaluate ecological risk. However, mean concentrations of select metals (lead and zinc) and PCBs in fish and crab tissue samples collected for evaluation of potential human exposures were entered into the aquatic food web models to determine if the use of these data would change the conclusions of the ERA. The methods and results of this additional evaluation are provided in this attachment.

In January 2012, four blue crab samples and four fish samples (2 snook and 2 mullet) were collected from the SWMU 6 lagoon (**Table D-1)**. The crabs were analyzed as whole body samples while the fish were gutted and then analyzed as whole body samples. Although these tissue samples were whole body, they do not represent typical exposures for the three upper trophic level receptors used in the ERA because:

- Spotted sandpiper – typically consumes small worms and small crustaceans (e.g., amphipods, small fiddler crabs) while the SWMU 6 data represent large blue crabs (average 11 cm and 125 g)
- Fishing bat – typically consumes small fish (< 8 cm and 5-10 g) while the SWMU 6 data represent large fish (average of 28 cm and 209 g)
- Green heron – typically consumes both small invertebrates (e.g., fiddler crabs) and small fish while the SWMU 6 data represent large crabs and large fish, as described above

Analytes measured in tissue samples included PCB congeners, lead, thallium, and zinc (the human health COPCs for this exposure pathway), plus percent moisture and percent lipids. Because thallium was not detected in any sample, it was not included in the evaluation. PCB congeners were used to calculate total PCB concentrations (all congeners summed, both using one-half of the detection limit for non-detects and detects only), PCB homologues were used to calculate total PCB concentrations (all congeners summed, both using one-half of the detection limit for non-detects and detects only), and the 12 dioxin-like congeners were used to calculate PCB TEQ concentrations (both using one-half of the detection limit for non-detects and detects only) using both bird and mammal TEFs. The total PCB and dioxin-like PCB (TEQ) calculations are shown in **Table D-2**. **Table D-3** shows the mean PCB and metal tissue concentrations used as the exposure point concentrations in the food web models when converted to a dry weight basis. The same aquatic food web models (see **Attachment C**) were used for this evaluation except that mean blue crab concentrations were substituted for modeled mean benthic invertebrate concentrations and mean fish concentrations (both species combined) were substituted for modeled fish concentrations.

PCB congeners were not analyzed for in sediment (just tissue). Mean sediment concentrations from the 2011 sampling for Aroclor 1254 (the only Aroclor detected) were used as a surrogate for total PCBs; mean 2011 sediment concentrations for lead and zinc were also used. The mean sediment concentration of Aroclor 1254 from the 2011 sampling was also adjusted to estimate the dioxin-like PCB (TEQ) sediment concentration using the average ratio of dioxin-like PCB crab tissue concentrations to total PCB (based on both congeners and homologues) crab tissue concentrations (bird TEQ only since only the sandpiper had a non-zero sediment ingestion rate), assuming that the ratios were similar for sediment and tissue (see **Table D-4**).

The results of the evaluation are shown in **Tables D-5 through D-7**. Only the MATC-based hazard quotient (HQ) for lead and the spotted sandpiper exceeded one (1.03). For the spotted sandpiper, lead exposure at the site is unlikely to result in unacceptable risk given the low magnitude of the risk estimate. **Table D-8** compares the HQs (MATC) for the modeled tissue inputs (**Attachment C**) to those resulting from the measured tissue inputs as described in this attachment. The results were very similar for most analytes and receptors and the use of the tissue samples collected to support the HHRA would not change the conclusions of the ERA as based upon tissue concentrations modeled from sediment.

ATTACHMENT TABLE D-1
Analytical Tissue Data for Fish and Crabs
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112
Sample Date	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	2/1/12	2/1/12	1/31/12
Site	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6
Species	Blue Crab	Blue Crab - Dup	Blue Crab	Blue Crab	Blue Crab	Snook	Snook - Dup	Snook	Mullet	Mullet
Polychlorinated Biphenyl Congeners (PG/G)										
2-Chlorobiphenyl (1)	2.7 J	3.1 J	1.9 J	2 J	1.9 U	2.2 J	2.8 J	4.4 J	5.8 U	2.1 J
3-Chlorobiphenyl (2)	3.5 J	4.1 J	2.1 J	2.5 J	1.4 J	2 U	1.9 U	1.5 J	6 U	1.2 J
4-Chlorobiphenyl (3)	1.1 J	1.2 J	1.5 J	2 J	1 J	0.89 J	0.91 J	0.86 J	6.2 U	1.6 J
2,2'-Dichlorobiphenyl (4)	9.9 J	8.7 J	4.3 J	10 U	9.7 U	9.7 J	12 J	24	46 U	4.9 J
2,3-Dichlorobiphenyl (5)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	52 U	9.8 U
2,3'-Dichlorobiphenyl (6)	9.8 U	11 J	11 J	7.4 J	9.7 U	7.2 J	8.4 J	20	53 U	7.4 J
2,4-Dichlorobiphenyl (7)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	51 U	9.8 U
2,4'-Dichlorobiphenyl (8)	37	39	37	31	15 J	24	25	60	280 J	32
2,5-Dichlorobiphenyl (9)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	57 U	9.8 U
2,6-Dichlorobiphenyl (10)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	34 U	9.8 U
3,3'-Dichlorobiphenyl (11)	71	72	70	91	47	16 J	25	32	310 J	26
3,5-Dichlorobiphenyl (14)	9.8 U	9.9 U	9.5 U	10 U	9.7 U	9.9 U	9.4 U	9.6 U	46 U	9.8 U
4,4'-Dichlorobiphenyl (15)	10 J	9.1 J	18 J	14 J	8.5 J	9.9 U	9.4 U	9.6 U	52 U	4 J
2,2',3-Trichlorobiphenyl (16)	10 J	11 J	4.2 J	1.4 J	0.97 U	5.9 J	6.9 J	17 J	76 J	8.9 J
2,2',4-Trichlorobiphenyl (17)	28	32	14 J	6.7 J	2.4 J	9.3 J	11 J	26	270 J	25
2,2',6-Trichlorobiphenyl (19)	11 J	11 J	2.3 J	1.6 J	0.97 U	9.8 J	11 J	29	110 J	8 J
2,3,4'-Trichlorobiphenyl (22)	58	63	130	56	27	31	35	80	430 J	37
2,3,5-Trichlorobiphenyl (23)	3.3 J	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	11 U	0.98 U
2,3,6-Trichlorobiphenyl (24)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.83 J	5.5 U	0.98 U
2,3',4-Trichlorobiphenyl (25)	23	26	18 J	17 J	8.3 J	12 J	13 J	29	210 J	14 J
2,3',6-Trichlorobiphenyl (27)	6.7 J	7.5 J	3.9 J	2.4 J	1 J	3.5 J	3.3 J	7.1 J	68 J	5.2 J
2,4',5-Trichlorobiphenyl (31)	220	250	170	200	90	140	160	250	1,900 J	130
2,4',6-Trichlorobiphenyl (32)	71	76	45	44	20	23	26	47	630 J	50
2,3',5'-Trichlorobiphenyl (34)	0.98 U	3.6 J	3.2 J	1.9 J	0.97 U	2.2 J	1.5 J	3.7 J	12 U	3.2 J
3,3',4-Trichlorobiphenyl (35)	2 U	2 U	3.4 J	2.7 J	1.9 U	2 U	1.9 U	1.9 U	12 U	2 U
3,3',5-Trichlorobiphenyl (36)	20	26	7.3 J	11 J	5.9 J	15 J	17 J	28	240 J	13 J
3,4,4'-Trichlorobiphenyl (37)	33	36	34	45	21	3.1 J	3.5 J	6.9 J	270 J	14 J
3,4,5-Trichlorobiphenyl (38)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	12 U	0.98 U
3,4',5-Trichlorobiphenyl (39)	0.98 U	1.6 J	3.5 J	1.6 J	0.97 U	0.99 U	0.94 U	0.96 U	11 U	1.1 J
2,2',3,4-Tetrachlorobiphenyl (41)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	1 U	3 J	56 J	5.4 J
2,2',3,4'-Tetrachlorobiphenyl (42)	78	79	44	47	21	9.5 J	9.5 J	42	780 J	60
2,2',3,5-Tetrachlorobiphenyl (43)	10 J	13 J	5.9 J	3.2 J	0.69 J	0.99 U	0.94 U	0.96 U	140 J	11 J
2,2',3,6-Tetrachlorobiphenyl (45)	26	22	3.2 J	2.7 J	1.2 J	13 J	17 J	34	220 J	18 J
2,2',3,6'-Tetrachlorobiphenyl (46)	10 J	10 J	3.2 J	1 U	0.97 U	3.3 J	3.8 J	9.9 J	120 J	7.7 J
2,2',4,5-Tetrachlorobiphenyl (48)	43	44	21	9.9 J	0.97 U	2.5 J	1.8 J	8.4 J	460 J	41
2,2',4,6'-Tetrachlorobiphenyl (51)	40	41	11 J	5.7 J	2.7 J	8.8 J	7.7 J	20	420 J	31
2,2',5,5'-Tetrachlorobiphenyl (52)	2,400	2,700	780	1,300	450	1,900	2,100	3,100	31,000	1,500
2,2',6,6'-Tetrachlorobiphenyl (54)	2 J	2.2 J	0.95 U	1 U	0.97 U	3.2 J	3.8 J	6 J	4.7 U	1.4 J
2,3,3',4-Tetrachlorobiphenyl (55)	2 U	2 U	1.9 U	2 U	1.9 U	2 U	1.9 U	1.9 U	28 U	10 J
2,3,3',4'-Tetrachlorobiphenyl (56)	280	300	140	210	100	37	39	130	2,400	160
2,3,3',5-Tetrachlorobiphenyl (57)	78	0.99 U	2.4 J	2.9 J	1.2 J	33	31 J	70	1,200 J	2.9 J

ATTACHMENT TABLE D-1
Analytical Tissue Data for Fish and Crabs
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112
Sample Date	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	2/1/12	2/1/12	1/31/12
Site	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6
Species	Blue Crab	Blue Crab - Dup	Blue Crab	Blue Crab	Blue Crab	Snook	Snook - Dup	Snook	Mullet	Mullet
2,3,3',5'-Tetrachlorobiphenyl (58)	1.1 U	0.99 U	3.1 J	3.1 J	1.1 J	0.99 U	0.97 U	1.5 U	27 U	2.5 J
2,3,4,4'-Tetrachlorobiphenyl (60)	160	170	210	200	80	160	180	280	1,400 J	82
2,3,4',5-Tetrachlorobiphenyl (63)	53	56	93	61	23	57	62	92	460 J	25
2,3,4',6-Tetrachlorobiphenyl (64)	350	360	150	280	130	170	180	330	3,700	200
2,3',4,4'-Tetrachlorobiphenyl (66)	1,200	1,300	1,100	1,200	460	1,300	1,400	1,700	11,000	580
2,3',4,5-Tetrachlorobiphenyl (67)	29	32	21	22	12 J	13 J	15 J	33	310 J	17 J
2,3',4,5'-Tetrachlorobiphenyl (68)	18 J	19 J	27	18 J	8.8 J	23	22 J	31 J	180 J	10 J
2,3',5,5'-Tetrachlorobiphenyl (72)	29	24	21	25	10 J	28	32	45	320 J	16 J
2,3',5',6-Tetrachlorobiphenyl (73)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	9 U	0.98 U
3,3',4,4'-Tetrachlorobiphenyl (77)	52	53	56	72	26	15	17	34 J	380	24
3,3',4,5-Tetrachlorobiphenyl (78)	1.3 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	1.1 U	1.7 U	30 U	0.98 U
3,3',4,5'-Tetrachlorobiphenyl (79)	71	71	19 J	16 J	7.4 J	19 J	21 J	38	460 J	15 J
3,3',5,5'-Tetrachlorobiphenyl (80)	1 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	1.4 U	25 U	0.98 U
3,4,4',5-Tetrachlorobiphenyl (81)	1.1 U	0.99 U	2.8	4.4	1.8 J	0.99 U	2.8 J	3.4	30 U	2
2,2',3,3',4-Pentachlorobiphenyl (82)	160	170	100	74	32	16 J	15 J	48	2,100	120
2,2',3,3',5-Pentachlorobiphenyl (83)	1.7 U	1.1 U	1.3 U	1.3 U	1 U	1.5 U	1.9 U	2.2 U	52 U	140
2,2',3,3',6-Pentachlorobiphenyl (84)	530	560	110	47	21	97	110	280	6,900	380
2,2',3,4,6'-Pentachlorobiphenyl (89)	14 J	15 J	4.1 J	2.9 J	1.2 U	1.6 U	2.1 U	2.5 U	170 J	14 J
2,2',3,5,5'-Pentachlorobiphenyl (92)	980	1,000	170	290	110	880	990	1,100	14,000	660
2,2',3,5,6'-Pentachlorobiphenyl (94)	8.8 J	9.1 J	6 J	2.6 J	1.1 U	1.6 U	2.1 J	4.2 J	88 J	6.6 J
2,2',3,5',6-Pentachlorobiphenyl (95)	2,500	2,900	400	350	120	780	850	1,700	35,000	1,600
2,2',3,6,6'-Pentachlorobiphenyl (96)	5.8 J	5.7 J	0.95 U	1 U	0.97 U	3.3 J	3.9 J	7.5 J	85 J	4.1 J
2,2',4,4',5-Pentachlorobiphenyl (99)	3,100	3,500	3,700	2,800	1,200	3,800	4,300	3,700	33,000	1,500
2,2',4,5',6-Pentachlorobiphenyl (103)	31	33	6.2 J	7 J	3.6 J	27	29	39	430 J	22
2,2',4,6,6'-Pentachlorobiphenyl (104)	0.98 U	0.57 J	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	3.4 U	0.98 U
2,3,3',4,4'-Pentachlorobiphenyl (105)	1,600	1,800	1,800	2,000	740	2,500	2,800	2,600	16,000	740
2,3,3',4,5-Pentachlorobiphenyl (106)	2 U	2 U	1.9 U	2 U	1.9 U	2 U	1.9 U	2.1 U	50 U	2 U
2,3,3',4,6-Pentachlorobiphenyl (109)	380	400	440	410	150	550	630	570	3,300	180
2,3,3',5,5'-Pentachlorobiphenyl (111)	1.2 U	5.4 J	6.7 J	6.1 J	0.97 U	6.5 J	6.6 J	5.6 J	39 U	2.3 J
2,3,3',5,6-Pentachlorobiphenyl (112)	1.6 U	1.1 U	1.3 U	1.3 U	1 U	1.4 U	1.9 U	2.2 U	51 U	1.3 U
2,3,4,4',5-Pentachlorobiphenyl (114)	120	120	150	120	39	170	200	170	1,300	52
2,3',4,4',5-Pentachlorobiphenyl (118)	5,600	6,400	6,400	6,100	2,400	8,200	9,300	8,200	54,000	2,400
2,3',4,5,5'-Pentachlorobiphenyl (120)	22	24	27	29	11 J	42	50	42	160 J	11 J
2,3',4,5',6-Pentachlorobiphenyl (121)	1.4 J	1.4 J	1 U	1 U	0.97 U	2.7 J	2.4 J	2.1 J	39 U	1 U
2,3,3',4',5'-Pentachlorobiphenyl (122)	61	58	48	48	19 J	1.2 U	1.5 U	1.8 U	41 U	27
2,3',4,4',5'-Pentachlorobiphenyl (123)	64	71	81	63	26	82 J	120 J	96	530	22
3,3',4,4',5-Pentachlorobiphenyl (126)	13 J	8.5 J	9.1 J	17	6	26	20	23	150 J	5.5
3,3',4,5,5'-Pentachlorobiphenyl (127)	7.6 J	8 J	5.3 J	6.7 J	0.97 U	13 J	13 J	8.8 J	41 U	4.1 J
2,2',3,3',4,5'-Hexachlorobiphenyl (130)	320	360	160	230	77	320	380	340	3,800	200
2,2',3,3',4,6-Hexachlorobiphenyl (131)	19 J	20 J	11 J	6.4 J	3.6 J	3.9 J	4.1 J	5.2 J	270 J	11 J
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	920	1,000	140	170	62	120	140	210	12,000	650
2,2',3,3',5,5'-Hexachlorobiphenyl (133)	74	83	46	73	21	63	75	81	870 J	46

ATTACHMENT TABLE D-1
Analytical Tissue Data for Fish and Crabs
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112
Sample Date	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	2/1/12	2/1/12	1/31/12
Site	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6
Species	Blue Crab	Blue Crab - Dup	Blue Crab	Blue Crab	Blue Crab	Snook	Snook - Dup	Snook	Mullet	Mullet
2,2',3,3',6,6'-Hexachlorobiphenyl (136)	290	310	12 J	9.9 J	4.7 J	48	56	85	4,800	210
2,2',3,4,4',5-Hexachlorobiphenyl (137)	220	240	190	150	55	240	270	210	2,400	110
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	670	690	190	280	110	580	700	540	8,800	430
2,2',3,4,5,6-Hexachlorobiphenyl (142)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	1.2 U	1.1 U	18 U	0.98 U
2,2',3,4,5',6-Hexachlorobiphenyl (144)	120	130	18 J	31	15 J	76	89	76	1,800 J	84
2,2',3,4,6,6'-Hexachlorobiphenyl (145)	1.1 J	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	11 U	0.98 U
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	650	710	690	730	270	960	1,100	860	6,800	340
2,2',3,4',5,6'-Hexachlorobiphenyl (148)	3.6 J	3.6 J	1.1 J	1.4 J	0.97 U	4.2 J	5.2 J	0.96 U	13 U	2.8 J
2,2',3,4',6,6'-Hexachlorobiphenyl (150)	3.7 J	4 J	0.95 U	1.1 J	0.97 U	1 J	0.94 U	0.96 U	18 J	2.9 J
2,2',3,5,6,6'-Hexachlorobiphenyl (152)	1.9 J	2.1 J	0.72 J	1 U	0.97 U	0.99 U	0.94 U	0.96 U	24 J	0.82 J
2,2',4,4',5,6'-Hexachlorobiphenyl (154)	56	58	59	55	23	61	73	51	600 J	31
2,2',4,4',6,6'-Hexachlorobiphenyl (155)	0.98 U	1 J	0.95 U	1.6 J	0.97 U	1.8 J	2.1 J	0.96 U	7.9 U	0.98 U
2,3,3',4,4',6-Hexachlorobiphenyl (158)	590	680	600	590	230	790	950	670	6,600	300
2,3,3',4,5,5'-Hexachlorobiphenyl (159)	6.3 J	8.5 J	0.96 J	1.9 J	0.97 U	1.2 U	1.6 U	1.9 U	68 J	5.4 J
2,3,3',4,5,6-Hexachlorobiphenyl (160)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	13 U	0.98 U
2,3,3',4,5',6-Hexachlorobiphenyl (161)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	14 U	0.98 U
2,3,3',4',5,5'-Hexachlorobiphenyl (162)	35	40	33	33	11 J	58	69	54	350 J	14 J
2,3,3',4',5',6-Hexachlorobiphenyl (164)	310	340	130	180	70	87 J	140 J	130	3,400	190
2,3,3',5,5',6-Hexachlorobiphenyl (165)	1.2 J	0.74 J	1 J	1.4 J	0.97 U	0.99 U	1.3 J	0.96 U	12 U	0.98 U
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	280	300	290	280	110	500	590	420	2,700	130
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.3 U	1.3 J	0.95 U	1 U	0.97 U	1.3 U	1.7 U	2.1 U	34 U	0.98 U
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	510	590	190	380	150	1,000	1,200	760	4,900	340
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	100	120	71	100	40	190	220	160	820 J	64
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	360	410	61	120	40	49	60	77	3,800	290
2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	15 J	17 J	4.4 J	11 J	4.5 J	20 J	24	13 J	180 J	12 J
2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	25	28	3 J	8 J	2.5 J	5.1 J	5.5 J	6.3 J	340 J	21
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	300	340	110	240	76	280	310	300	2,900	220
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	82	94	40	80	26	56	62	71	850 J	63
2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	100	110	7.8 J	17 J	5.2 J	14 J	16 J	17 J	1,400 J	92
2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	13 J	15 J	13 J	13 J	3.7 J	27	30	14 J	69 J	8.3 J
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	5.2 J	5.1 J	4.1 J	3.3 J	1.5 J	4.7 J	4.9 J	3.1 J	37 J	3 J
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	230	260	200	240	99	450	550	340	2,400	160
2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	1.2 J	0.94 J	0.57 J	0.9 J	0.97 U	0.99 U	1.6 J	0.96 U	6.8 U	0.98 U
2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	31 J	48 J	1.9 U	2 U	6.4 J	39	1.9 U	27 J	22 U	23
2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	6.3 U	0.98 U
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	540	620	450	690	270	730	850	580	4,500	330
2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	3.1 J	3 J	1.5 J	2.7 J	1.9 J	4.5 J	5.1 J	2.4 J	14 J	1.1 J
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	19	20	13	20	7.4	35	43	22 J	150 J	9.8
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	79	82	43	70	28	8.7 J	190	130	840 J	50
2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	24	25	14 J	22	9.2 J	43	50	32	280 J	15 J
2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.96 U	1.2 U	16 U	0.98 U
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	79	86	28	96	43	150	200	110	840 J	66

ATTACHMENT TABLE D-1
Analytical Tissue Data for Fish and Crabs
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112
Sample Date	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	2/1/12	2/1/12	1/31/12
Site	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6
Species	Blue Crab	Blue Crab - Dup	Blue Crab	Blue Crab	Blue Crab	Snook	Snook - Dup	Snook	Mullet	Mullet
2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	31	34	9.8 J	28	12 J	65	73	43	310 J	31
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	48	56	32	61	30	75	83	54	470 J	41
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	5.6 J	4.8 J	2.6 J	6.6 J	2.7 J	7.6 J	8.1 J	5.6 J	48 J	3.4 J
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	7.2 J	7.2 J	1.9 U	2 U	1.9 U	1.4 J	2.4 J	1.9 U	68 J	8.3 J
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	17 J	20 J	8.3 J	19 J	9.8 J	24	26	17 J	150 J	15 J
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	36	38	20	45	18 J	37	44	37	320 J	29
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	75	83	34	65	31	160	180	100	730 J	78
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	0.98 U	0.99 U	0.95 U	1 U	0.97 U	0.99 U	0.94 U	0.96 U	8.3 U	0.98 U
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	2.8 J	3.7 J	0.95 U	1 J	0.97 U	6.3 J	7.5 J	2.5 J	36 J	3.7 J
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	33	39	9.3 J	27	14 J	61	71	42	450 J	40
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	5.8 J	7 J	2.8 J	6.8 J	4.9 J	10 J	11 J	6.6 J	69 J	5.4 J
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	18 J	19 J	8.8 J	19 J	10 J	24	29	17 J	160 J	17 J
Decachlorobiphenyl (209)	13 J	15 J	6.1 J	16 J	9.8 J	21	23	13 J	130 J	15 J
Congeners (13/12)	20 U	20 U	19 U	20 U	19 U	20 U	19 U	19 U	55 U	20 U
Congeners (21/33)	93	100	57	39 J	15 J	23 J	26 J	60	790 J	88
Congeners (26/29)	48	54	26 J	40	20 J	34 J	39	65	440 J	30 J
Congeners (28/20)	320	350	500	370	160	230	260	460	2,600 J	180
Congeners (30/18)	62	64	23 J	16 J	6.3 J	26 J	28 J	79	570 J	46
Congeners (40/71)	200	210	170	97	48	31 J	29 J	75	1,800 J	160
Congeners (44/47/65)	940	980	700	480	240	420	440	850	11,000	560
Congeners (50/53)	110	110	43	15 J	6.5 J	43	47	96	1,000 J	68
Congeners (59/62/75)	63	64	61	42 J	19 J	52 J	54 J	85	630 J	38
Congeners (61/70/74/76)	2,600	2,800	2,000	2,100	830	2,300	2,400	3,500	26,000	1,300
Congeners (69/49)	870	910	290	390	190	520	560	1,000	10,000	510
Congeners (86/87/97/108/119/125)	2,500	2,700	1,200	920	470	710	820	1,300	33,000	1,600
Congeners (88/91)	470	510	65	160	71	180	190	290	6,000	300
Congeners (93/100)	29	30 J	26 J	19 J	9.5 J	27 J	30 J	35 J	370 J	17 J
Congeners (98/102)	77	82	31 J	16 J	5.4 J	2.2 J	2 U	16 J	930 J	60
Congeners (107/124)	200	220	130	160	55	210	250	240	2,100 J	110
Congeners (110/115)	6,100	6,700	3,600	3,500	1,600	1,200	1,400	2,600	70,000	3,200
Congeners (113/90/101)	5,900	6,600	2,400	3,800	1,400	3,800	4,300	5,800	80,000	3,600
Congeners (117/116/85)	800	860	780	690	270	930	1,100	1,100	7,700	460
Congeners (128/166)	750	840	530	640	270	990	1,200	840	8,600	430
Congeners (134/143)	130	120	35 J	23 J	7 J	14 J	17	27 J	1,800 J	88
Congeners (138/163/129)	5,200	5,600	4,300	5,200	1,900	9,100	11,000	7,800	59,000	2,800
Congeners (139/140)	95	100	84	72	33	100	120	82	1,100 J	54
Congeners (147/149)	2,700	2,900	740	1,400	530	390	450	560	35,000	1,700
Congeners (151/135)	830	900	130	180	69	320	380	400	12,000	610
Congeners (153/168)	4,100	4,600	4,500	4,500	1,700	7,400	8,800	6,400	46,000	2,200
Congeners (156/157)	830	920	870	920	340	1,500	1,700	1,300	8,000	380
Congeners (171/173)	180	210	100	140	62	300	340	200	1,700 J	110
Congeners (180/193)	960	1,100	660	980	390	1,700	2,000	1,400	8,500	580

ATTACHMENT TABLE D-1
Analytical Tissue Data for Fish and Crabs
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112
Sample Date	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12	2/1/12	2/1/12	1/31/12
Site	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6
Species	Blue Crab	Blue Crab - Dup	Blue Crab	Blue Crab	Blue Crab	Snook	Snook - Dup	Snook	Mullet	Mullet
Congeners (198/199)	160	180	97	210	92	230	250	160	1,200 J	130
Total Dichlorobiphenyls	130	150	140	140	70	57	70	140	590	75
Total Heptachlorobiphenyls	3,600	4,100	2,000	3,100	1,200	5,000	6,000	4,100	34,000	2,400
Total Hexachlorobiphenyls	19,000	21,000	14,000	16,000	6,000	21,000	24,000	19,000	230,000	11,000
Total Monochlorobiphenyls	7.4	8.5	5.5	6.6	2.4	4.1	4.7	6.8	0 U	4.8
Total Nonachlorobiphenyls	57	65	21	53	29	96	110	66	680	63
Total Octachlorobiphenyls	460	510	230	530	240	760	870	530	4,200	400
Total Pentachlorobiphenyls	31,000	34,000	22,000	22,000	8,700	25,000	29,000	33,000	370,000	17,000
Total Tetrachlorobiphenyls	9,800	10,000	6,100	6,500	2,700	7,200	7,700	12,000	110,000	5,400
Total Trichlorobiphenyls	1,000	1,100	1,000	850	380	570	650	1,200	8,700	650
Total Metals (MG/KG)										
Lead	5.14	4.12	3.55	2.07	2.15	0.097 J	0.055 J	0.057	1.65 J	0.271
Thallium	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Zinc	21.6	20.3	19.3	26.4	26.6	16.9 J	10.8 J	16.1	15.5	13.5
Wet Chemistry (Percent)										
Solids	35.8	31.2	34.8	35.4	34.4	30.0	28.4	23.4	33.1	22.5
Lipids	0.37	0.41	0.24	0.62	0.46	0.38	0.4	0.8	5.4	0.38

Notes:
All concentrations are in wet weight
J - Estimated
U - Nondetect or not detected at significantly greater than that in an associated blank.
MG/KG - Milligrams per kilogram
PG/G - Picograms per gram

ATTACHMENT TABLE D-2
Analytical Tissue Data for Fish and Crabs (Wet-Weight) - Calculation of Total PCB Concentrations
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID			VWW06-CRB01-0112			VWW06-CRB01P-0112			VWW06-CRB02-0112			VWW06-CRB03-0112			VWW06-CRB04-0112			VWW06-FS01-0112			VWW06-FS01P-0112			VWW06-FS02-0212			VWW06-FS03-0212			VWW06-FS04-0112		
Sample Date			1/31/12		Det	1/31/12			1/31/12		Det	1/31/12		Det	1/31/12		Det	1/31/12		Det	1/31/12		Det	2/1/12		Det	2/1/12			1/31/12		Det
Site	Mammal TEFs	Bird TEFs	SWMU 6	Det	and	SWMU 6	Det	Det and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6		Det and	SWMU 6	Det	and
Species	(2005)	(1998)	Blue Crab	Only	1/2 ND	Blue Crab - Dup	Only	1/2 ND	Blue Crab	Only	1/2 ND	Blue Crab	Only	1/2 ND	Blue Crab	Only	1/2 ND	Snook	Only	1/2 ND	Snook - Dup	Only	1/2 ND	Snook	Only	1/2 ND	Mullet	Det Only	1/2 ND	Mullet	Only	1/2 ND
Polychlorinated Biphenyl Congeners (PG/G)																																
2-Chlorobiphenyl (1)			2.7 J	2.7	2.7	3.1 J	3.1	3.1	1.9 J	1.9	1.9	2 J	2	2	1.9 U		0.95	2.2 J	2.2	2.2	2.8 J	2.8	2.8	4.4 J	4.4	4.4	5.8 U		2.9	2.1 J	2.1	2.1
3-Chlorobiphenyl (2)			3.5 J	3.5	3.5	4.1 J	4.1	4.1	2.1 J	2.1	2.1	2.5 J	2.5	2.5	1.4 J	1.4	1.4	2 U		1	1.9 U		0.95	1.5 J	1.5	1.5	6 U		3	1.2 J	1.2	1.2
4-Chlorobiphenyl (3)			1.1 J	1.1	1.1	1.2 J	1.2	1.2	1.5 J	1.5	1.5	2 J	2	2	1 J	1	1	0.89 J	0.89	0.89	0.91 J	0.91	0.91	0.86 J	0.86	0.86	6.2 U		3.1	1.6 J	1.6	1.6
2,2'-Dichlorobiphenyl (4)			9.9 J	9.9	9.9	8.7 J	8.7	8.7	4.3 J	4.3	4.3	10 U		5	9.7 U		4.85	9.7 J	9.7	9.7	12 J	12	12	24	24	24	46 U		23	4.9 J	4.9	4.9
2,3-Dichlorobiphenyl (5)			9.8 U		4.9	9.9 U		4.95	9.5 U		4.75	10 U		5	9.7 U		4.85	9.9 U		4.95	9.4 U		4.7	9.6 U		4.8	52 U		26	9.8 U		4.9
2,3'-Dichlorobiphenyl (6)			9.8 U		4.9	11 J	11	11	11 J	11	11	7.4 J	7.4	7.4	9.7 U		4.85	7.2 J	7.2	7.2	8.4 J	8.4	8.4	20	20	20	53 U		26.5	7.4 J	7.4	7.4
2,4-Dichlorobiphenyl (7)			9.8 U		4.9	9.9 U		4.95	9.5 U		4.75	10 U		5	9.7 U		4.85	9.9 U		4.95	9.4 U		4.7	9.6 U		4.8	51 U		25.5	9.8 U		4.9
2,4'-Dichlorobiphenyl (8)			37	37	37	39	39	39	37	37	37	31	31	31	15 J	15	15	24	24	24	25	25	25	60	60	60	280 J	280	280	32	32	32
2,5-Dichlorobiphenyl (9)			9.8 U		4.9	9.9 U		4.95	9.5 U		4.75	10 U		5	9.7 U		4.85	9.9 U		4.95	9.4 U		4.7	9.6 U		4.8	57 U		28.5	9.8 U		4.9
2,6-Dichlorobiphenyl (10)			9.8 U		4.9	9.9 U		4.95	9.5 U		4.75	10 U		5	9.7 U		4.85	9.9 U		4.95	9.4 U		4.7	9.6 U		4.8	34 U		17	9.8 U		4.9
3,3'-Dichlorobiphenyl (11)			71	71	71	72	72	72	70	70	70	91	91	91	47	47	47	16 J	16	16	25	25	25	32	32	32	310 J	310	310	26	26	26
3,5-Dichlorobiphenyl (14)			9.8 U		4.9	9.9 U		4.95	9.5 U		4.75	10 U		5	9.7 U		4.85	9.9 U		4.95	9.4 U		4.7	9.6 U		4.8	46 U		23	9.8 U		4.9
4,4'-Dichlorobiphenyl (15)			10 J	10	10	9.1 J	9.1	9.1	18 J	18	18	14 J	14	14	8.5 J	8.5	8.5	9.9 U		4.95	9.4 U		4.7	9.6 U		4.8	52 U		26	4 J	4	4
2,2',3-Trichlorobiphenyl (16)			10 J	10	10	11 J	11	11	4.2 J	4.2	4.2	1.4 J	1.4	1.4	0.97 U		0.485	5.9 J	5.9	5.9	6.9 J	6.9	6.9	17 J	17	17	76 J	76	76	8.9 J	8.9	8.9
2,2',4-Trichlorobiphenyl (17)			28	28	28	32	32	32	14 J	14	14	6.7 J	6.7	6.7	2.4 J	2.4	2.4	9.3 J	9.3	9.3	11 J	11	11	26	26	26	270 J	270	270	25	25	25
2,2',6-Trichlorobiphenyl (19)			11 J	11	11	11 J	11	11	2.3 J	2.3	2.3	1.6 J	1.6	1.6	0.97 U		0.485	9.8 J	9.8	9.8	11 J	11	11	29	29	29	110 J	110	110	8 J	8	8
2,3,4'-Trichlorobiphenyl (22)			58	58	58	63	63	63	130	130	130	56	56	56	27	27	27	31	31	31	35	35	35	80	80	80	430 J	430	430	37	37	37
2,3,5-Trichlorobiphenyl (23)			3.3 J	3.3	3.3	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	11 U		5.5	0.98 U		0.49
2,3,6-Trichlorobiphenyl (24)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.83 J	0.83	0.83	5.5 U		2.75	0.98 U		0.49
2,3',4-Trichlorobiphenyl (25)			23	23	23	26	26	26	18 J	18	18	17 J	17	17	8.3 J	8.3	8.3	12 J	12	12	13 J	13	13	29	29	29	210 J	210	210	14 J	14	14
2,3',6-Trichlorobiphenyl (27)			6.7 J	6.7	6.7	7.5 J	7.5	7.5	3.9 J	3.9	3.9	2.4 J	2.4	2.4	1 J	1	1	3.5 J	3.5	3.5	3.3 J	3.3	3.3	7.1 J	7.1	7.1	68 J	68	68	5.2 J	5.2	5.2
2,4',5-Trichlorobiphenyl (31)			220	220	220	250	250	250	170	170	170	200	200	200	90	90	90	140	140	140	160	160	160	250	250	250	1,900 J	1900	1900	130	130	130
2,4',6-Trichlorobiphenyl (32)			71	71	71	76	76	76	45	45	45	44	44	44	20	20	20	23	23	23	26	26	26	47	47	47	630 J	630	630	50	50	50
2,3',5'-Trichlorobiphenyl (34)			0.98 U		0.49	3.6 J	3.6	3.6	3.2 J	3.2	3.2	1.9 J	1.9	1.9	0.97 U		0.485	2.2 J	2.2	2.2	1.5 J	1.5	1.5	3.7 J	3.7	3.7	12 U		6	3.2 J	3.2	3.2
3,3',4-Trichlorobiphenyl (35)			2 U		1	2 U		1	3.4 J	3.4	3.4	2.7 J	2.7	2.7	1.9 U		0.95	2 U		1	1.9 U		0.95	1.9 U		0.95	12 U		6	2 U		1
3,3',5-Trichlorobiphenyl (36)			20	20	20	26	26	26	7.3 J	7.3	7.3	11 J	11	11	5.9 J	5.9	5.9	15 J	15	15	17 J	17	17	28	28	28	240 J	240	240	13 J	13	13
3,4,4'-Trichlorobiphenyl (37)			33	33	33	36	36	36	34	34	34	45	45	45	21	21	21	3.1 J	3.1	3.1	3.5 J	3.5	3.5	6.9 J	6.9	6.9	270 J	270	270	14 J	14	14
3,4,5-Trichlorobiphenyl (38)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	12 U		6	0.98 U		0.49
3,4',5-Trichlorobiphenyl (39)			0.98 U		0.49	1.6 J	1.6	1.6	3.5 J	3.5	3.5	1.6 J	1.6	1.6	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	11 U		5.5	1.1 J	1.1	1.1
2,2',3,4-Tetrachlorobiphenyl (41)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	1 U		0.5	3 J	3	3	56 J	56	56	5.4 J	5.4	5.4
2,2',3,4'-Tetrachlorobiphenyl (42)			78	78	78	79	79	79	44	44	44	47	47	47	21	21	21	9.5 J	9.5	9.5	9.5 J	9.5	9.5	42	42	42	780 J	780	780	60	60	60
2,2',3,5-Tetrachlorobiphenyl (43)			10 J	10	10	13 J	13	13	5.9 J	5.9	5.9	3.2 J	3.2	3.2	0.69 J	0.69	0.69	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	140 J	140	140	11 J	11	11
2,2',3,6-Tetrachlorobiphenyl (45)			26	26	26	22	22	22	3.2 J	3.2	3.2	2.7 J	2.7	2.7	1.2 J	1.2	1.2	13 J	13	13	17 J	17	17	34	34	34	220 J	220	220	18 J	18	18
2,2',3,6'-Tetrachlorobiphenyl (46)			10 J	10	10	10 J	10	10	3.2 J	3.2	3.2	1 U		0.5	0.97 U		0.485	3.3 J	3.3	3.3	3.8 J	3.8	3.8	9.9 J	9.9	9.9	120 J	120	120	7.7 J	7.7	7.7
2,2',4,5-Tetrachlorobiphenyl (48)			43	43	43	44	44	44	21	21	21	9.9 J	9.9	9.9	0.97 U		0.485	2.5 J	2.5	2.5	1.8 J	1.8	1.8	8.4 J	8.4	8.4	460 J	460	460	41	41	41
2,2',4,6'-Tetrachlorobiphenyl (51)			40	40	40	41	41	41	11 J	11	11	5.7 J	5.7	5.7	2.7 J	2.7	2.7	8.8 J	8.8	8.8	7.7 J	7.7	7.7	20	20	20	420 J	420	420	31	31	31
2,2',5,5'-Tetrachlorobiphenyl (52)			2,400	2400	2400	2,700	2700	2700	780	780	780	1,300	1300	1300	450	450	450	1,900	1900	1900	2,100	2100	2100	3,100	3100	3100	31,000	31000	31000	1,500	1500	1500
2,2',6,6'-Tetrachlorobiphenyl (54)			2 J	2	2	2.2 J	2.2	2.2	0.95 U		0.475	1 U		0.5	0.97 U		0.485	3.2 J	3.2	3.2	3.8 J	3.8	3.8	6 J	6	6	4.7 U		2.35	1.4 J	1.4	1.4
2,3,3',4-Tetrachlorobiphenyl (55)			2 U		1	2 U		1	1.9 U		0.95	2 U		1	1.9 U		0.95	2 U		1	1.9 U		0.95	1.9 U		0.95	28 U		14	10 J	10	10
2,3,3',4'-Tetrachlorobiphenyl (56)			280	280	280	300	300	300	140	140	140	210	210	210	100	100	100	37	37	37	39	39	39	130	130	130	2,400	2400	2400	160	160	160
2,3,3',5-Tetrachlorobiphenyl (57)			78	78	78	0.99 U		0.495	2.4 J	2.4	2.4	2.9 J	2.9	2.9	1.2 J	1.2	1.2	33	33	33	31 J	31	31	70	70	70	1,200 J	1200	1200	2.9 J	2.9	2.9
2,3,3',5'-Tetrachlorobiphenyl (58)			1.1 U		0.55	0.99 U		0.495	3.1 J	3.1	3.1	3.1 J	3.1	3.1	1.1 J	1.1	1.1	0.99 U		0.495	0.97 U		0.485	1.5 U		0.75	27 U		13.5	2.5 J	2.5	2.5
2,3,4,4'-Tetrachlorobiphenyl (60)			160	160	160	170	170	170	210	210	210	200	200	200	80	80	80	160	160	160	180	180	180	280	280	280	1,400 J	1400	1400	82	82	82
2,3,4',5-Tetrachlorobiphenyl (63)			53	53	53	56	56	56	93	93	93	61	61	61	23	23	23	57	57	57	62	62	62	92	92	92	460 J	460	460	25	25	25
2,3,4',6-Tetrachlorobiphenyl (64)			350	350	350	360	360	360	150	150	150	280	280	280	130	130	130	170	170	170	180	180	180	330	330	330	3,700	3700	3700	200	200	200
2,3',4,4'-Tetrachlorobiphenyl (66)			1,200	1200	1200	1,300	1300	1300	1,100	1100	1100	1,200	1200	1200	460	460	460	1,300	1300	1300	1,400	1400	1400	1,700	1700	1700	11,000	11000	11000	580	580	580
2,3',4,5-Tetrachlorobiphenyl (67)			29	29	29	32	32	32	21	21	21	22	22	22	12 J	12	12	13 J	13	13	15 J	15	15	33	33	33	310 J	310	310	17 J	17	17
2,3',4,5'-Tetrachlorobiphenyl (68)			18 J	18	18	19 J	19	19	27	27	27	18 J	18	18	8.8 J	8.8	8.8	23	23	23	22 J	22	22	31 J	31	31	180 J	180	180	10 J	10	10
2,3',5,5'-Tetrachlorobiphenyl (72)			29	29	29	24	24	24	21	21	21	25	25	25	10 J	10	10	28	28	28	32	32	32	45	45	45	320 J	320	320	16 J	16	16
2,3',5',6-Tetrachlorobiphenyl (73)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	9 U		4.5	0.98 U		0.49
3,3',4,4'-Tetrachlorobiphenyl (77)	0.0001	0.05	52	52	52	53	53	53	56	56	56	72	72	72	26	26	26	15	15	15	17	17	17	34 J	34	34	380	380	380	24	24	24
3,3',4,5-Tetrachlorobiphenyl (78)			1.3 U		0.65	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	1.1 U		0.55	1.7 U		0.85	30 U		15	0.98 U		0.49
3,3',4,5'-Tetrachlorobiphenyl (79)			71	71	71	71	71	71	19 J	19	19	16 J	16	16	7.4 J	7.4	7.4	19 J	19	19	21 J	21	21	38	38	38	460 J	460	460	15 J	15	15
3,3',5,5'-Tetrachlorobiphenyl (80)			1 U		0.5	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	1.4 U		0.7	25 U		12.5	0.98 U		0.49
3,4,4',5-Tetrachlorobiphenyl (81)	0.0003	0.1	1.1 U		0.55	0.99 U		0.495	2.8	2.8	2.8	4.4	4.4	4.4	1.8 J	1.8	1.8	0.99 U		0.495	2.8 J	2.8	2.8	3.4	3.4	3.4	30 U		15	2	2	2
2,2',3,3',4-Pentachlorobiphenyl (82)			160	160	160	170	170	170	100	100	100	74	74	74	32	32	32	16 J	16	16	15 J	15	15	48	48	48	2,100	2100	2100	120	120	120
2,2',3,3',5-Pentachlorobiphenyl (83)			1.7 U		0.85	1.1 U		0.55	1.3 U		0.65	1.3 U		0.65	1 U		0.5	1.5 U		0.75	1.9 U		0.95	2.2 U		1.1	52 U		26	140	140	140
2,2',3,3',6-Pentachlorobiphenyl (84)			530	530	530	560	560	560	110	110	110	47	47	47	21	21	21	97	97	97	110	110	110	280	280	280	6,900	6900	6900	380	380	380
2,2',3,4,6'-Pentachlorobiphenyl (89)			14 J	14	14	15 J	15	15	4.1 J	4.1	4.1	2.9 J	2.9	2.9	1.2 U		0.6	1.6 U		0.8	2.1 U		1.05	2.5 U		1.25	170 J	170	170	14 J	14	14
2,2',3,5,5'-Pentachlorobiphenyl (92)			980	980	980	1,000	1000	1000	170	170	170	290	290	290	110	110	110	880	880	880	990	990	990	1,100	1100	1100	14,000	14000	14000	660	660	660
2,2',3,5,6'-Pentachlorobiphenyl (94)			8.8 J	8.8	8.8	9.1 J	9.1	9.1	6 J	6	6	2.6 J	2.6	2.6	1.1 U		0.55	1.6 U		0.8	2.1 J	2.1	2.1	4.2 J	4.2	4.2	88 J	88	88	6.6 J	6.6	6.6
2,2',3,5',6-Pentachlorobiphenyl (95)			2,500	2500	2500	2,900	2900	2900	400	400	400	350	350	350	120	120	120	780	780	780	850	850	850	1,700	1700	1700	35,000	35000	35000	1,600	1600	1600
2,2',3,6,6'-Pentachlorobiphenyl (96)			5.8 J	5.8	5.8	5.7 J	5.7	5.7	0.95 U		0.475	1 U		0.5	0.97 U		0.485	3.3 J	3.3	3.3	3.9 J	3.9	3.9	7.5 J	7.5	7.5	85 J	85	85	4.1 J	4.1	4.1
2,2',4,4',5-Pentachlorobiphenyl (99)			3,100	3100	3100	3,500	3500	3500	3,700	3700	3700	2,800	2800	2800	1,200	1200	1200	3,800	3800	3800	4,300	4300	4300	3,700	3700	3700	33,000	33000	33000	1,500	1500	1500
2,2',4,5',6-Pentachlorobiphenyl (103)			31	31	31	33	33	33	6.2 J	6.2	6.2	7 J	7	7	3.6 J	3.6	3.6	27	27	27	29	29	29	39	39	39	430 J	430	430	22	22	22
2,2',4,6,6'-Pentachlorobiphenyl (104)			0.98 U		0.49	0.57 J	0.57	0.57	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	3.4 U		1.7	0.98 U		0.49

ATTACHMENT TABLE D-2
Analytical Tissue Data for Fish and Crabs (Wet-Weight) - Calculation of Total PCB Concentrations
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID			VWW06-CRB01-0112			VWW06-CRB01P-0112			VWW06-CRB02-0112			VWW06-CRB03-0112			VWW06-CRB04-0112			VWW06-FS01-0112			VWW06-FS01P-0112			VWW06-FS02-0212			VWW06-FS03-0212			VWW06-FS04-0112		
Sample Date			1/31/12		Det	1/31/12			1/31/12		Det	1/31/12		Det	1/31/12		Det	1/31/12		Det	1/31/12		Det	2/1/12		Det	2/1/12			1/31/12		Det
Site	Mammal TEFs	Bird TEFs	SWMU 6	Det	and	SWMU 6	Det	Det and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6		Det and	SWMU 6	Det	and
Species	(2005)	(1998)	Blue Crab	Only	1/2 ND	Blue Crab - Dup	Only	1/2 ND	Blue Crab	Only	1/2 ND	Blue Crab	Only	1/2 ND	Blue Crab	Only	1/2 ND	Snook	Only	1/2 ND	Snook - Dup	Only	1/2 ND	Snook	Only	1/2 ND	Mullet	Det Only	1/2 ND	Mullet	Only	1/2 ND
2,3,3',4,4'-Pentachlorobiphenyl (105)	0.00003	0.0001	1,600	1600	1600	1,800	1800	1800	1,800	1800	1800	2,000	2000	2000	740	740	740	2,500	2500	2500	2,800	2800	2800	2,600	2600	2600	16,000	16000	16000	740	740	740
2,3,3',4,5-Pentachlorobiphenyl (106)			2 U		1	2 U		1	1.9 U		0.95	2 U		1	1.9 U		0.95	2 U		1	1.9 U		0.95	2.1 U		1.05	50 U		25	2 U		1
2,3,3',4,6-Pentachlorobiphenyl (109)			380	380	380	400	400	400	440	440	440	410	410	410	150	150	150	550	550	550	630	630	630	570	570	570	3,300	3300	3300	180	180	180
2,3,3',5,5'-Pentachlorobiphenyl (111)			1.2 U		0.6	5.4 J	5.4	5.4	6.7 J	6.7	6.7	6.1 J	6.1	6.1	0.97 U		0.485	6.5 J	6.5	6.5	6.6 J	6.6	6.6	5.6 J	5.6	5.6	39 U		19.5	2.3 J	2.3	2.3
2,3,3',5,6-Pentachlorobiphenyl (112)			1.6 U		0.8	1.1 U		0.55	1.3 U		0.65	1.3 U		0.65	1 U		0.5	1.4 U		0.7	1.9 U		0.95	2.2 U		1.1	51 U		25.5	1.3 U		0.65
2,3,4,4',5-Pentachlorobiphenyl (114)	0.00003	0.0001	120	120	120	120	120	120	150	150	150	120	120	120	39	39	39	170	170	170	200	200	200	170	170	170	1,300	1300	1300	52	52	52
2,3',4,4',5-Pentachlorobiphenyl (118)	0.00003	0.00001	5,600	5600	5600	6,400	6400	6400	6,400	6400	6400	6,100	6100	6100	2,400	2400	2400	8,200	8200	8200	9,300	9300	9300	8,200	8200	8200	54,000	54000	54000	2,400	2400	2400
2,3',4,5,5'-Pentachlorobiphenyl (120)			22	22	22	24	24	24	27	27	27	29	29	29	11 J	11	11	42	42	42	50	50	50	42	42	42	160 J	160	160	11 J	11	11
2,3',4,5',6-Pentachlorobiphenyl (121)			1.4 J	1.4	1.4	1.4 J	1.4	1.4	1 U		0.5	1 U		0.5	0.97 U		0.485	2.7 J	2.7	2.7	2.4 J	2.4	2.4	2.1 J	2.1	2.1	39 U		19.5	1 U		0.5
2,3,3',4',5'-Pentachlorobiphenyl (122)			61	61	61	58	58	58	48	48	48	48	48	48	19 J	19	19	1.2 U		0.6	1.5 U		0.75	1.8 U		0.9	41 U		20.5	27	27	27
2,3',4,4',5'-Pentachlorobiphenyl (123)	0.00003	0.00001	64	64	64	71	71	71	81	81	81	63	63	63	26	26	26	82 J	82	82	120 J	120	120	96	96	96	530	530	530	22	22	22
3,3',4,4',5-Pentachlorobiphenyl (126)	0.1	0.1	13 J	13	13	8.5 J	8.5	8.5	9.1 J	9.1	9.1	17	17	17	6	6	6	26	26	26	20	20	20	23	23	23	150 J	150	150	5.5	5.5	5.5
3,3',4,5,5'-Pentachlorobiphenyl (127)			7.6 J	7.6	7.6	8 J	8	8	5.3 J	5.3	5.3	6.7 J	6.7	6.7	0.97 U		0.485	13 J	13	13	13 J	13	13	8.8 J	8.8	8.8	41 U		20.5	4.1 J	4.1	4.1
2,2',3,3',4,5'-Hexachlorobiphenyl (130)			320	320	320	360	360	360	160	160	160	230	230	230	77	77	77	320	320	320	380	380	380	340	340	340	3,800	3800	3800	200	200	200
2,2',3,3',4,6-Hexachlorobiphenyl (131)			19 J	19	19	20 J	20	20	11 J	11	11	6.4 J	6.4	6.4	3.6 J	3.6	3.6	3.9 J	3.9	3.9	4.1 J	4.1	4.1	5.2 J	5.2	5.2	270 J	270	270	11 J	11	11
2,2',3,3',4,6'-Hexachlorobiphenyl (132)			920	920	920	1,000	1000	1000	140	140	140	170	170	170	62	62	62	120	120	120	140	140	140	210	210	210	12,000	12000	12000	650	650	650
2,2',3,3',5,5'-Hexachlorobiphenyl (133)			74	74	74	83	83	83	46	46	46	73	73	73	21	21	21	63	63	63	75	75	75	81	81	81	870 J	870	870	46	46	46
2,2',3,3',6,6'-Hexachlorobiphenyl (136)			290	290	290	310	310	310	12 J	12	12	9.9 J	9.9	9.9	4.7 J	4.7	4.7	48	48	48	56	56	56	85	85	85	4,800	4800	4800	210	210	210
2,2',3,4,4',5-Hexachlorobiphenyl (137)			220	220	220	240	240	240	190	190	190	150	150	150	55	55	55	240	240	240	270	270	270	210	210	210	2,400	2400	2400	110	110	110
2,2',3,4,5,5'-Hexachlorobiphenyl (141)			670	670	670	690	690	690	190	190	190	280	280	280	110	110	110	580	580	580	700	700	700	540	540	540	8,800	8800	8800	430	430	430
2,2',3,4,5,6-Hexachlorobiphenyl (142)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	1.2 U		0.6	1.1 U		0.55	18 U		9	0.98 U		0.49
2,2',3,4,5',6-Hexachlorobiphenyl (144)			120	120	120	130	130	130	18 J	18	18	31	31	31	15 J	15	15	76	76	76	89	89	89	76	76	76	1,800 J	1800	1800	84	84	84
2,2',3,4,6,6'-Hexachlorobiphenyl (145)			1.1 J	1.1	1.1	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	11 U		5.5	0.98 U		0.49
2,2',3,4',5,5'-Hexachlorobiphenyl (146)			650	650	650	710	710	710	690	690	690	730	730	730	270	270	270	960	960	960	1,100	1100	1100	860	860	860	6,800	6800	6800	340	340	340
2,2',3,4',5,6'-Hexachlorobiphenyl (148)			3.6 J	3.6	3.6	3.6 J	3.6	3.6	1.1 J	1.1	1.1	1.4 J	1.4	1.4	0.97 U		0.485	4.2 J	4.2	4.2	5.2 J	5.2	5.2	0.96 U		0.48	13 U		6.5	2.8 J	2.8	2.8
2,2',3,4',6,6'-Hexachlorobiphenyl (150)			3.7 J	3.7	3.7	4 J	4	4	0.95 U		0.475	1.1 J	1.1	1.1	0.97 U		0.485	1 J	1	1	0.94 U		0.47	0.96 U		0.48	18 J	18	18	2.9 J	2.9	2.9
2,2',3,5,6,6'-Hexachlorobiphenyl (152)			1.9 J	1.9	1.9	2.1 J	2.1	2.1	0.72 J	0.72	0.72	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	24 J	24	24	0.82 J	0.82	0.82
2,2',4,4',5,6'-Hexachlorobiphenyl (154)			56	56	56	58	58	58	59	59	59	55	55	55	23	23	23	61	61	61	73	73	73	51	51	51	600 J	600	600	31	31	31
2,2',4,4',6,6'-Hexachlorobiphenyl (155)			0.98 U		0.49	1 J	1	1	0.95 U		0.475	1.6 J	1.6	1.6	0.97 U		0.485	1.8 J	1.8	1.8	2.1 J	2.1	2.1	0.96 U		0.48	7.9 U		3.95	0.98 U		0.49
2,3,3',4,4',6-Hexachlorobiphenyl (158)			590	590	590	680	680	680	600	600	600	590	590	590	230	230	230	790	790	790	950	950	950	670	670	670	6,600	6600	6600	300	300	300
2,3,3',4,5,5'-Hexachlorobiphenyl (159)			6.3 J	6.3	6.3	8.5 J	8.5	8.5	0.96 J	0.96	0.96	1.9 J	1.9	1.9	0.97 U		0.485	1.2 U		0.6	1.6 U		0.8	1.9 U		0.95	68 J	68	68	5.4 J	5.4	5.4
2,3,3',4,5,6-Hexachlorobiphenyl (160)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	13 U		6.5	0.98 U		0.49
2,3,3',4,5',6-Hexachlorobiphenyl (161)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	14 U		7	0.98 U		0.49
2,3,3',4',5,5'-Hexachlorobiphenyl (162)			35	35	35	40	40	40	33	33	33	33	33	33	11 J	11	11	58	58	58	69	69	69	54	54	54	350 J	350	350	14 J	14	14
2,3,3',4',5',6-Hexachlorobiphenyl (164)			310	310	310	340	340	340	130	130	130	180	180	180	70	70	70	87 J	87	87	140 J	140	140	130	130	130	3,400	3400	3400	190	190	190
2,3,3',5,5',6-Hexachlorobiphenyl (165)			1.2 J	1.2	1.2	0.74 J	0.74	0.74	1 J	1	1	1.4 J	1.4	1.4	0.97 U		0.485	0.99 U		0.495	1.3 J	1.3	1.3	0.96 U		0.48	12 U		6	0.98 U		0.49
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	0.00003	0.00001	280	280	280	300	300	300	290	290	290	280	280	280	110	110	110	500	500	500	590	590	590	420	420	420	2,700	2700	2700	130	130	130
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	0.03	0.001	1.3 U		0.65	1.3 J	1.3	1.3	0.95 U		0.475	1 U		0.5	0.97 U		0.485	1.3 U		0.65	1.7 U		0.85	2.1 U		1.05	34 U		17	0.98 U		0.49
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)			510	510	510	590	590	590	190	190	190	380	380	380	150	150	150	1,000	1000	1000	1,200	1200	1200	760	760	760	4,900	4900	4900	340	340	340
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)			100	100	100	120	120	120	71	71	71	100	100	100	40	40	40	190	190	190	220	220	220	160	160	160	820 J	820	820	64	64	64
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)			360	360	360	410	410	410	61	61	61	120	120	120	40	40	40	49	49	49	60	60	60	77	77	77	3,800	3800	3800	290	290	290
2,2',3,3',4,5',6-Heptachlorobiphenyl (175)			15 J	15	15	17 J	17	17	4.4 J	4.4	4.4	11 J	11	11	4.5 J	4.5	4.5	20 J	20	20	24	24	24	13 J	13	13	180 J	180	180	12 J	12	12
2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)			25	25	25	28	28	28	3 J	3	3	8 J	8	8	2.5 J	2.5	2.5	5.1 J	5.1	5.1	5.5 J	5.5	5.5	6.3 J	6.3	6.3	340 J	340	340	21	21	21
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)			300	300	300	340	340	340	110	110	110	240	240	240	76	76	76	280	280	280	310	310	310	300	300	300	2,900	2900	2900	220	220	220
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)			82	82	82	94	94	94	40	40	40	80	80	80	26	26	26	56	56	56	62	62	62	71	71	71	850 J	850	850	63	63	63
2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)			100	100	100	110	110	110	7.8 J	7.8	7.8	17 J	17	17	5.2 J	5.2	5.2	14 J	14	14	16 J	16	16	17 J	17	17	1,400 J	1400	1400	92	92	92
2,2',3,4,4',5,6-Heptachlorobiphenyl (181)			13 J	13	13	15 J	15	15	13 J	13	13	13 J	13	13	3.7 J	3.7	3.7	27	27	27	30	30	30	14 J	14	14	69 J	69	69	8.3 J	8.3	8.3
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)			5.2 J	5.2	5.2	5.1 J	5.1	5.1	4.1 J	4.1	4.1	3.3 J	3.3	3.3	1.5 J	1.5	1.5	4.7 J	4.7	4.7	4.9 J	4.9	4.9	3.1 J	3.1	3.1	37 J	37	37	3 J	3	3
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)			230	230	230	260	260	260	200	200	200	240	240	240	99	99	99	450	450	450	550	550	550	340	340	340	2,400	2400	2400	160	160	160
2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)			1.2 J	1.2	1.2	0.94 J	0.94	0.94	0.57 J	0.57	0.57	0.9 J	0.9	0.9	0.97 U		0.485	0.99 U		0.495	1.6 J	1.6	1.6	0.96 U		0.48	6.8 U		3.4	0.98 U		0.49
2,2',3,4,5,5',6-Heptachlorobiphenyl (185)			31 J	31	31	48 J	48	48	1.9 U		0.95	2 U		1	6.4 J	6.4	6.4	39	39	39	1.9 U		0.95	27 J	27	27	22 U		11	23	23	23
2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	6.3 U		3.15	0.98 U		0.49
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)			540	540	540	620	620	620	450	450	450	690	690	690	270	270	270	730	730	730	850	850	850	580	580	580	4,500	4500	4500	330	330	330
2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)			3.1 J	3.1	3.1	3 J	3	3	1.5 J	1.5	1.5	2.7 J	2.7	2.7	1.9 J	1.9	1.9	4.5 J	4.5	4.5	5.1 J	5.1	5.1	2.4 J	2.4	2.4	14 J	14	14	1.1 J	1.1	1.1
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	0.00003	0.00001	19	19	19	20	20	20	13	13	13	20	20	20	7.4	7.4	7.4	35	35	35	43	43	43	22 J	22	22	150 J	150	150	9.8	9.8	9.8
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)			79	79	79	82	82	82	43	43	43	70	70	70	28	28	28	8.7 J	8.7	8.7	190	190	190	130	130	130	840 J	840	840	50	50	50
2,3,3',4,4',5',6-Heptachlorobiphenyl (191)			24	24	24	25	25	25	14 J	14	14	22	22	22	9.2 J	9.2	9.2	43	43	43	50	50	50	32	32	32	280 J	280	280	15 J	15	15
2,3,3',4,5,5',6-Heptachlorobiphenyl (192)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.96 U		0.48	1.2 U		0.6	16 U		8	0.98 U		0.49
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)			79	79	79	86	86	86	28	28	28	96	96	96	43	43	43	150	150	150	200	200	200	110	110	110	840 J	840	840	66	66	66
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (195)			31	31	31	34	34	34	9.8 J	9.8	9.8	28	28	28	12 J	12	12	65	65	65	73	73	73	43	43	43	310 J	310	310	31	31	31
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)			48	48	48	56	56	56	32	32	32	61	61	61	30	30	30	75	75	75	83	83	83	54	54	54	470 J	470	470	41	41	41
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)			5.6 J	5.6	5.6	4.8 J	4.8	4.8	2.6 J	2.6	2.6	6.6 J	6.6	6.6	2.7 J	2.7	2.7	7.6 J	7.6	7.6	8.1 J	8.1	8.1	5.6 J	5.6	5.6	48 J	48	48	3.4 J	3.4	3.4
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)			7.2 J	7.2	7.2	7.2 J	7.2	7.2	1.9 U		0.95	2 U		1	1.9 U		0.95	1.4 J	1.4	1.4	2.4 J	2.4	2.4	1.9 U		0.95	68 J	68	68	8.3 J	8.3	8.3
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)			17 J	17	17	20 J	20	20	8.3 J	8.3	8.3	19 J	19	19	9.8 J	9.8	9.8	24	24	24	26	26	26	17 J	17	17	150 J	150	150	15 J	15	15
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)			36	36	36	38	38	38	20	20	20	45	45	45	18 J	18	18	37	37	37	44	44	44	37	37	37	320 J	320	320	29	29	29
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)			75	75	75	83	83	83	34	34	34	65	65	65	31	31	31	160	160	160	180	180	180	100	100	100	730 J	730	730	78	78	78
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)			0.98 U		0.49	0.99 U		0.495	0.95 U		0.475	1 U		0.5	0.97 U		0.485	0.99 U		0.495	0.94 U		0.47	0.96 U		0.48	8.3 U		4.15	0.98 U		0.49

ATTACHMENT TABLE D-2
Analytical Tissue Data for Fish and Crabs (Wet-Weight) - Calculation of Total PCB Concentrations
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID			VWW06-CRB01-0112			VWW06-CRB01P-0112			VWW06-CRB02-0112			VWW06-CRB03-0112			VWW06-CRB04-0112			VWW06-FS01-0112			VWW06-FS01P-0112			VWW06-FS02-0212			VWW06-FS03-0212			VWW06-FS04-0112		
Sample Date			1/31/12		Det	1/31/12			1/31/12		Det	1/31/12		Det	1/31/12		Det	1/31/12		Det	1/31/12		Det	2/1/12		Det	2/1/12			1/31/12		Det
Site	Mammal TEFs	Bird TEFs	SWMU 6	Det	and	SWMU 6	Det	Det and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6	Det	and	SWMU 6		Det and	SWMU 6	Det	and
Species	(2005)	(1998)	Blue Crab	Only	1/2 ND	Blue Crab - Dup	Only	1/2 ND	Blue Crab	Only	1/2 ND	Blue Crab	Only	1/2 ND	Blue Crab	Only	1/2 ND	Blue Crab	Only	1/2 ND	Snook - Dup	Only	1/2 ND	Snook	Only	1/2 ND	Mullet	Det Only	1/2 ND	Mullet	Only	1/2 ND
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)			2.8 J	2.8	2.8	3.7 J	3.7	3.7	0.95 U		0.475	1 J	1	1	0.97 U		0.485	6.3 J	6.3	6.3	7.5 J	7.5	7.5	2.5 J	2.5	2.5	36 J	36	36	3.7 J	3.7	3.7
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)			33	33	33	39	39	39	9.3 J	9.3	9.3	27	27	27	14 J	14	14	61	61	61	71	71	71	42	42	42	450 J	450	450	40	40	40
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)			5.8 J	5.8	5.8	7 J	7	7	2.8 J	2.8	2.8	6.8 J	6.8	6.8	4.9 J	4.9	4.9	10 J	10	10	11 J	11	11	6.6 J	6.6	6.6	69 J	69	69	5.4 J	5.4	5.4
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)			18 J	18	18	19 J	19	19	8.8 J	8.8	8.8	19 J	19	19	10 J	10	10	24	24	24	29	29	29	17 J	17	17	160 J	160	160	17 J	17	17
Decachlorobiphenyl (209)			13 J	13	13	15 J	15	15	6.1 J	6.1	6.1	16 J	16	16	9.8 J	9.8	9.8	21	21	21	23	23	23	13 J	13	13	130 J	130	130	15 J	15	15
Congeners (13/12)			20 U		10	20 U		10	19 U		9.5	20 U		10	19 U		9.5	20 U		10	19 U		9.5	19 U		9.5	55 U		27.5	20 U		10
Congeners (21/33)			93	93	93	100	100	100	57	57	57	39 J	39	39	15 J	15	15	23 J	23	23	26 J	26	26	60	60	60	790 J	790	790	88	88	88
Congeners (26/29)			48	48	48	54	54	54	26 J	26	26	40	40	40	20 J	20	20	34 J	34	34	39	39	39	65	65	65	440 J	440	440	30 J	30	30
Congeners (28/20)			320	320	320	350	350	350	500	500	500	370	370	370	160	160	160	230	230	230	260	260	260	460	460	460	2,600 J	2600	2600	180	180	180
Congeners (30/18)			62	62	62	64	64	64	23 J	23	23	16 J	16	16	6.3 J	6.3	6.3	26 J	26	26	28 J	28	28	79	79	79	570 J	570	570	46	46	46
Congeners (40/71)			200	200	200	210	210	210	170	170	170	97	97	97	48	48	48	31 J	31	31	29 J	29	29	75	75	75	1,800 J	1800	1800	160	160	160
Congeners (44/47/65)			940	940	940	980	980	980	700	700	700	480	480	480	240	240	240	420	420	420	440	440	440	850	850	850	11,000	11000	11000	560	560	560
Congeners (50/53)			110	110	110	110	110	110	43	43	43	15 J	15	15	6.5 J	6.5	6.5	43	43	43	47	47	47	96	96	96	1,000 J	1000	1000	68	68	68
Congeners (59/62/75)			63	63	63	64	64	64	61	61	61	42 J	42	42	19 J	19	19	52 J	52	52	54 J	54	54	85	85	85	630 J	630	630	38	38	38
Congeners (61/70/74/76)			2,600	2600	2600	2,800	2800	2800	2,000	2000	2000	2,100	2100	2100	830	830	830	2,300	2300	2300	2,400	2400	2400	3,500	3500	3500	26,000	26000	26000	1,300	1300	1300
Congeners (69/49)			870	870	870	910	910	910	290	290	290	390	390	390	190	190	190	520	520	520	560	560	560	1,000	1000	1000	10,000	10000	10000	510	510	510
Congeners (86/87/97/108/119/125)			2,500	2500	2500	2,700	2700	2700	1,200	1200	1200	920	920	920	470	470	470	710	710	710	820	820	820	1,300	1300	1300	33,000	33000	33000	1,600	1600	1600
Congeners (88/91)			470	470	470	510	510	510	65	65	65	160	160	160	71	71	71	180	180	180	190	190	190	290	290	290	6,000	6000	6000	300	300	300
Congeners (93/100)			29	29	29	30 J	30	30	26 J	26	26	19 J	19	19	9.5 J	9.5	9.5	27 J	27	27	30 J	30	30	35 J	35	35	370 J	370	370	17 J	17	17
Congeners (98/102)			77	77	77	82	82	82	31 J	31	31	16 J	16	16	5.4 J	5.4	5.4	2.2 J	2.2	2.2	2 U		1	16 J	16	16	930 J	930	930	60	60	60
Congeners (107/124)			200	200	200	220	220	220	130	130	130	160	160	160	55	55	55	210	210	210	250	250	250	240	240	240	2,100 J	2100	2100	110	110	110
Congeners (110/115)			6,100	6100	6100	6,700	6700	6700	3,600	3600	3600	3,500	3500	3500	1,600	1600	1600	1,200	1200	1200	1,400	1400	1400	2,600	2600	2600	70,000	70000	70000	3,200	3200	3200
Congeners (113/90/101)			5,900	5900	5900	6,600	6600	6600	2,400	2400	2400	3,800	3800	3800	1,400	1400	1400	3,800	3800	3800	4,300	4300	4300	5,800	5800	5800	80,000	80000	80000	3,600	3600	3600
Congeners (117/116/85)			800	800	800	860	860	860	780	780	780	690	690	690	270	270	270	930	930	930	1,100	1100	1100	1,100	1100	1100	7,700	7700	7700	460	460	460
Congeners (128/166)			750	750	750	840	840	840	530	530	530	640	640	640	270	270	270	990	990	990	1,200	1200	1200	840	840	840	8,600	8600	8600	430	430	430
Congeners (134/143)			130	130	130	120	120	120	35 J	35	35	23 J	23	23	7 J	7	7	14 J	14	14	17	17	17	27 J	27	27	1,800 J	1800	1800	88	88	88
Congeners (138/163/129)			5,200	5200	5200	5,600	5600	5600	4,300	4300	4300	5,200	5200	5200	1,900	1900	1900	9,100	9100	9100	11,000	11000	11000	7,800	7800	7800	59,000	59000	59000	2,800	2800	2800
Congeners (139/140)			95	95	95	100	100	100	84	84	84	72	72	72	33	33	33	100	100	100	120	120	120	82	82	82	1,100 J	1100	1100	54	54	54
Congeners (147/149)			2,700	2700	2700	2,900	2900	2900	740	740	740	1,400	1400	1400	530	530	530	390	390	390	450	450	450	560	560	560	35,000	35000	35000	1,700	1700	1700
Congeners (151/135)			830	830	830	900	900	900	130	130	130	180	180	180	69	69	69	320	320	320	380	380	380	400	400	400	12,000	12000	12000	610	610	610
Congeners (153/168)			4,100	4100	4100	4,600	4600	4600	4,500	4500	4500	4,500	4500	4500	1,700	1700	1700	7,400	7400	7400	8,800	8800	8800	6,400	6400	6400	46,000	46000	46000	2,200	2200	2200
Congeners (156/157)	0.00003	0.0001	830	830	830	920	920	920	870	870	870	920	920	920	340	340	340	1,500	1500	1500	1,700	1700	1700	1,300	1300	1300	8,000	8000	8000	380	380	380
Congeners (171/173)			180	180	180	210	210	210	100	100	100	140	140	140	62	62	62	300	300	300	340	340	340	200	200	200	1,700 J	1700	1700	110	110	110
Congeners (180/193)			960	960	960	1,100	1100	1100	660	660	660	980	980	980	390	390	390	1,700	1700	1700	2,000	2000	2000	1,400	1400	1400	8,500	8500	8500	580	580	580
Congeners (198/199)			160	160	160	180	180	180	97	97	97	210	210	210	92	92	92	230	230	230	250	250	250	160	160	160	1,200 J	1200	1200	130	130	130
Total PCB Congeners (Det and 1/2 ND)			65,499			72,122			44,919			48,806			19,358			61,659			71,263			68,888			747,994			37,369		
Total PCB Congeners (Det only)			65,445			72,075			44,870			48,750			19,290			61,600			71,205			68,828			747,404			37,323		
Decachlorobiphenyl (209)			13 J	13	13	15 J	15	15	6.1 J	6.1	6.1	16 J	16	16	9.8 J	9.8	9.8	21	21	21	23	23	23	13 J	13	13	130 J	130	130	15 J	15	15
Total Dichlorobiphenyls			130	130	130	150	150	150	140	140	140	140	140	140	70	70	70	57	57	57	70	70	70	140	140	140	590	590	590	75	75	75
Total Heptachlorobiphenyls			3,600	3600	3600	4,100	4100	4100	2,000	2000	2000	3,100	3100	3100	1,200	1200	1200	5,000	5000	5000	6,000	6000	6000	4,100	4100	4100	34,000	34000	34000	2,400	2400	2400
Total Hexachlorobiphenyls			19,000	19000	19000	21,000	21000	21000	14,000	14000	14000	16,000	16000	16000	6,000	6000	6000	21,000	21000	21000	24,000	24000	24000	19,000	19000	19000	230,000	230000	230000	11,000	11000	11000
Total Monochlorobiphenyls			7.4	7.4	7.4	8.5	8.5	8.5	5.5	5.5	5.5	6.6	6.6	6.6	2.4	2.4	2.4	4.1	4.1	4.1	4.7	4.7	4.7	6.8	6.8	6.8	0 U		0	4.8	4.8	4.8
Total Nonachlorobiphenyls			57	57	57	65	65	65	21	21	21	53	53	53	29	29	29	96	96	96	110	110	110	66	66	66	680	680	680	63	63	63
Total Octachlorobiphenyls			460	460	460	510	510	510	230	230	230	530	530	530	240	240	240	760	760	760	870	870	870	530	530	530	4,200	4200	4200	400	400	400
Total Pentachlorobiphenyls			31,000	31000	31000	34,000	34000	34000	22,000	22000	22000	22,000	22000	22000	8,700	8700	8700	25,000	25000	25000	29,000	29000	29000	33,000	33000	33000	370,000	370000	370000	17,000	17000	17000
Total Tetrachlorobiphenyls			9,800	9800	9800	10,000	10000	10000	6,100	6100	6100	6,500	6500	6500	2,700	2700	2700	7,200	7200	7200	7,700	7700	7700	12,000	12000	12000	110,000	110000	110000	5,400	5400	5400
Total Trichlorobiphenyls			1,000	1000	1000	1,100	1100	1100	1,000	1000	1000	850	850	850	380	380	380	570	570	570	650	650	650	1,200	1200	1200	8,700	8700	8700	650	650	650
Total PCB Homologs (Det and 1/2 ND)			65,067			70,949			45,503			49,196			19,331			59,708			68,428			70,056			758,300			37,008		
Total PCB Homologs (Det only)			65,067			70,949			45,503			49,196			19,331			59,708			68,428			70,056			758,300			37,008		
TEQ Mammal (Det and 1/2 ND)			1.5803			1.1834			1.2188			2.0086			0.7276			3.0108			2.4706			2.7202			18.0329			0.6797		
TEQ Mammal (Det only)			1.5606			1.1832			1.2046			1.9936			0.7130			2.9911			2.4451			2.6887			17.5184			0.6650		
TEQ Bird (Det and 1/2 ND)			4.2703			3.9027			4.3403			6.1091			2.2178			3.9053			3.7014			4.8354			38.6208			2.0933		
TEQ Bird (Det only)			4.2146			3.8532			4.3398			6.1086			2.2173			3.8552			3.7005			4.8344			37.1038			2.0928		

ATTACHMENT TABLE D-3
Analytical Tissue Data for Fish and Crabs - Exposure Point Concentrations
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Sample ID	VWW06-CRB01-0112	VWW06-CRB01P-0112	VWW06-CRB02-0112	VWW06-CRB03-0112	VWW06-CRB04-0112	Mean Crab	VWW06-FS01-0112	VWW06-FS01P-0112	VWW06-FS02-0212	VWW06-FS03-0212	VWW06-FS04-0112	Mean Fish
Sample Date	1/31/12	1/31/12	1/31/12	1/31/12	1/31/12		1/31/12	1/31/12	2/1/12	2/1/12	1/31/12	
Site	SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6		SWMU 6	SWMU 6	SWMU 6	SWMU 6	SWMU 6	
Species	Blue Crab	Blue Crab - Dup	Blue Crab	Blue Crab	Blue Crab		Snook	Snook - Dup	Snook	Mullet	Mullet	
PCB Congeners (PG/G wet weight)												
Total PCB Congeners (Det and 1/2 ND)	65,499	72,122	44,919	48,806	19,358		61,659	71,263	68,888	747,994	37,369	
Total PCB Congeners (Det only)	65,445	72,075	44,870	48,750	19,290		61,600	71,205	68,828	747,404	37,323	
Total PCB Homologs (Det and 1/2 ND)	65,067	70,949	45,503	49,196	19,331		59,708	68,428	70,056	758,300	37,008	
Total PCB Homologs (Det only)	65,067	70,949	45,503	49,196	19,331		59,708	68,428	70,056	758,300	37,008	
TEQ Mammal (Det and 1/2 ND)	1.5803	1.1834	1.2188	2.0086	0.7276		3.0108	2.4706	2.7202	18.0329	0.6797	
TEQ Mammal (Det only)	1.5606	1.1832	1.2046	1.9936	0.7130		2.9911	2.4451	2.6887	17.5184	0.6650	
TEQ Bird (Det and 1/2 ND)	4.2703	3.9027	4.3403	6.1091	2.2178		3.9053	3.7014	4.8354	38.6208	2.0933	
TEQ Bird (Det only)	4.2146	3.8532	4.3398	6.1086	2.2173		3.8552	3.7005	4.8344	37.1038	2.0928	
PCB Congeners (mg/kg dry weight)												
Total PCB Congeners (Det and 1/2 ND)	0.18280	0.23086	0.12923	0.13807	0.05635	0.13863	0.20560	0.25110	0.29439	2.25844	0.16616	0.74252
Total PCB Congeners (Det only)	0.18265	0.23071	0.12909	0.13791	0.05616	0.13847	0.20540	0.25090	0.29414	2.25665	0.16595	0.74191
Total PCB Homologs (Det and 1/2 ND)	0.18160	0.22711	0.13091	0.13917	0.05628	0.13836	0.19909	0.24111	0.29938	2.28955	0.16455	0.74865
Total PCB Homologs (Det only)	0.18160	0.22711	0.13091	0.13917	0.05628	0.13836	0.19909	0.24111	0.29938	2.28955	0.16455	0.74865
TEQ Mammal (Det and 1/2 ND)	4.41E-06	3.79E-06	3.51E-06	5.68E-06	2.12E-06	0.0000039	1.00E-05	8.71E-06	1.16E-05	5.44E-05	3.02E-06	0.000020
TEQ Mammal (Det only)	4.36E-06	3.79E-06	3.47E-06	5.64E-06	2.08E-06	0.0000039	9.97E-06	8.62E-06	1.15E-05	5.29E-05	2.96E-06	0.000019
TEQ Bird (Det and 1/2 ND)	1.19E-05	1.25E-05	1.25E-05	1.73E-05	6.46E-06	0.000012	1.302E-05	1.304E-05	2.07E-05	1.17E-04	9.31E-06	0.000040
TEQ Bird (Det only)	1.18E-05	1.23E-05	1.25E-05	1.73E-05	6.46E-06	0.000012	1.29E-05	1.30E-05	2.07E-05	1.12E-04	9.31E-06	0.000039
Total Metals (MG/KG wet weight)												
Lead	5.14	4.12	3.55	2.07	2.15		0.097	0.055	0.057	1.65	0.271	
Zinc	21.6	20.3	19.3	26.4	26.6		16.9	10.8	16.1	15.5	13.5	
Total Metals (MG/KG dry weight)												
Lead	14.35	13.19	10.21	5.86	6.26	9.17	0.32	0.19	0.24	4.98	1.20	1.69
Zinc	60.28	64.98	55.52	74.68	77.44	68.2	56.35	38.05	68.80	46.80	60.03	58.0
Wet Chemistry (Percent)												
Solids	35.8	31.2	34.8	35.4	34.4		30.0	28.4	23.4	33.1	22.5	
Lipids	0.37	0.41	0.24	0.62	0.46		0.38	0.40	0.80	5.40	0.38	

ATTACHMENT TABLE D-4
Estimation of Sediment Concentrations for Dioxin-Like PCB Congeners
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

	Mean Sediment Concentration (mg/kg)	Mean Crab Concentration (mg/kg dw)
Total PCBs		
Aroclor-1254	7.11E-02	--
Total PCB Cong (Det and 1/2 ND)	--	1.39E-01
Total PCB Cong (Det only)	--	1.38E-01
Total PCB Homologs (Det and 1/2 ND)	--	1.38E-01
Total PCB Homologs (Det only)	--	1.38E-01
Dioxin-Like PCBs (TEQ)		
TEQ Bird (Det and 1/2 ND)	--	1.22E-05
TEQ Bird (Det only)	--	1.21E-05
Congeners		
Ratio dioxin-like to total PCB (Det + 1/2 ND)	--	8.79E-05
Ratio dioxin-like to total PCB (Det)	--	8.77E-05
Homologs		
Ratio dioxin-like to total PCB (Det + 1/2 ND)	--	8.80E-05
Ratio dioxin-like to total PCB (Det)	--	8.77E-05
Average Ratios		
Det +1/2 ND	--	8.79E-05
Det	--	8.77E-05
Bird TEFs		
Estimated Dioxin-Like (Det + 1/2 ND)	6.25E-06	--
Estimated Dioxin-Like (Det)	6.24E-06	--

ATTACHMENT TABLE D-5
Summary of Green Heron Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Mean Crab Concentration (mg/kg dw)	Aquatic Plant Concentration (mg/kg dw)	Mean Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals												
Lead	205	9.17E+00	0.00E+00	1.69E+00	0	4.74E-01	3.85	8.61	19.3	1.23E-01	5.50E-02	2.46E-02
Zinc	274	6.82E+01	0.00E+00	5.80E+01	0	7.48E+00	66.1	148	331	1.13E-01	5.06E-02	2.26E-02
Total PCBs												
Total PCB Congeners (Det and 1/2 ND)	0.0711	1.39E-01	0.00E+00	7.43E-01	0	6.97E-02	1.50	3.35	7.50	4.64E-02	2.08E-02	9.29E-03
Total PCB Congeners (Det only)	0.0711	1.38E-01	0.00E+00	7.42E-01	0	6.96E-02	1.50	3.35	7.50	4.64E-02	2.08E-02	9.28E-03
Total PCB Homologs (Det and 1/2 ND)	0.0711	1.38E-01	0.00E+00	7.49E-01	0	7.02E-02	1.50	3.35	7.50	4.68E-02	2.09E-02	9.36E-03
Total PCB Homologs (Det only)	0.0711	1.38E-01	0.00E+00	7.49E-01	0	7.02E-02	1.50	3.35	7.50	4.68E-02	2.09E-02	9.36E-03
Dioxin-Like PCBs (TEQ)												
TEQ Bird (Det and 1/2 ND)	6.25E-06	1.22E-05	0.00E+00	3.99E-05	0	3.91E-06	0.000014	0.000044	0.00014	2.79E-01	8.84E-02	2.79E-02
TEQ Bird (Det only)	6.24E-06	1.21E-05	0.00E+00	3.88E-05	0	3.81E-06	0.000014	0.000044	0.00014	2.72E-01	8.61E-02	2.72E-02

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specifi = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0230 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specifi = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.290 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specifi = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specifi = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.710 = Proportion of diet composed of food item (fish)
SCx = Chemical-specifi = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0192 = Water ingestion rate (L/day)
WC = Chemical-specifi = Concentration of chemical in water (mg/L)
BW = 0.187 = Body weight (kg)

ATTACHMENT TABLE D-6
Summary of Spotted Sandpiper Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Mean Crab Concentration (mg/kg dw)	Aquatic Plant Concentration (mg/kg dw)	Mean Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals												
Lead	205	9.17E+00	0.00E+00	1.69E+00	0	8.85E+00	3.85	8.61	19.3	2.30E+00	1.03E+00	4.60E-01
Zinc	274	6.82E+01	0.00E+00	5.80E+01	0	2.09E+01	66.1	148	331	3.17E-01	1.42E-01	6.34E-02
Total PCBs												
Total PCB Congeners (Det and 1/2 ND)	0.0711	1.39E-01	0.00E+00	7.43E-01	0	2.52E-02	1.50	3.35	7.50	1.68E-02	7.50E-03	3.36E-03
Total PCB Congeners (Det only)	0.0711	1.38E-01	0.00E+00	7.42E-01	0	2.51E-02	1.50	3.35	7.50	1.68E-02	7.50E-03	3.35E-03
Total PCB Homologs (Det and 1/2 ND)	0.0711	1.38E-01	0.00E+00	7.49E-01	0	2.51E-02	1.50	3.35	7.50	1.67E-02	7.49E-03	3.35E-03
Total PCB Homologs (Det only)	0.0711	1.38E-01	0.00E+00	7.49E-01	0	2.51E-02	1.50	3.35	7.50	1.67E-02	7.49E-03	3.35E-03
Dioxin-Like PCBs (TEQ)												
TEQ Bird (Det and 1/2 ND)	6.25E-06	1.22E-05	0.00E+00	3.99E-05	0	2.21E-06	0.000014	0.000044	0.00014	1.58E-01	4.99E-02	1.58E-02
TEQ Bird (Det only)	6.24E-06	1.21E-05	0.00E+00	3.88E-05	0	2.20E-06	0.000014	0.000044	0.00014	1.57E-01	4.98E-02	1.57E-02

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specifi = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0080 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specifi = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.820 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specifi = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specifi = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specifi = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.180 = Proportion of diet composed of sediment
WIR = 0.0069 = Water ingestion rate (L/day)
WC = Chemical-specifi = Concentration of chemical in water (mg/L)
BW = 0.0404 = Body weight (kg)

ATTACHMENT TABLE D-7
Summary of Fishing Bat Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Mean Crab Concentration (mg/kg dw)	Aquatic Plant Concentration (mg/kg dw)	Mean Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals												
Lead	205	9.17E+00	0.00E+00	1.69E+00	0	1.65E-01	4.70	6.47	8.90	3.52E-02	2.56E-02	1.86E-02
Zinc	274	6.82E+01	0.00E+00	5.80E+01	0	5.68E+00	75.4	169	377	7.54E-02	3.37E-02	1.51E-02
Total PCBs												
Total PCB Congeners (Det and 1/2 ND)	0.0711	1.39E-01	0.00E+00	7.43E-01	0	7.28E-02	0.136	0.30	0.68	5.35E-01	2.39E-01	1.07E-01
Total PCB Congeners (Det only)	0.0711	1.38E-01	0.00E+00	7.42E-01	0	7.27E-02	0.136	0.30	0.68	5.35E-01	2.39E-01	1.07E-01
Total PCB Homologs (Det and 1/2 ND)	0.0711	1.38E-01	0.00E+00	7.49E-01	0	7.34E-02	0.136	0.30	0.68	5.40E-01	2.41E-01	1.08E-01
Total PCB Homologs (Det only)	0.0711	1.38E-01	0.00E+00	7.49E-01	0	7.34E-02	0.136	0.30	0.68	5.40E-01	2.41E-01	1.08E-01
Dioxin-Like PCBs (TEQ)												
TEQ Mammal (Det and 1/2 ND)	6.25E-06	3.93E-06	0.00E+00	1.98E-05	0	1.94E-06	0.000001	0.000003	0.00001	1.94E+00	6.13E-01	1.94E-01
TEQ Mammal (Det only)	6.24E-06	3.88E-06	0.00E+00	1.93E-05	0	1.89E-06	0.000001	0.000003	0.00001	1.89E+00	5.99E-01	1.89E-01

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0053 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0072 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0544 = Body weight (kg)

ATTACHMENT TABLE D-8
Comparison of MATC Hazard Quotients Using Modeled and Measured Mean Tissue Concentrations
SWMU 6 Feasibility Study Report
Former NASD, Vieques, Puerto Rico

Chemical	Green Heron		Spotted Sandpiper		Fishing Bat	
	Modeled	Measured	Modeled	Measured	Modeled	Measured
Metals						
Lead	3.11E-01	5.50E-02	1.04E+00	1.03E+00	4.04E-01	2.56E-02
Zinc	2.48E-01	5.06E-02	2.40E-01	1.42E-01	2.07E-01	3.37E-02
Total PCBs						
Aroclor-1254	4.45E-02	--	1.08E-02	--	5.25E-01	--
Total PCB Congeners (Det and 1/2 ND)	--	2.08E-02	--	7.50E-03	--	2.39E-01
Total PCB Congeners (Det only)	--	2.08E-02	--	7.50E-03	--	2.39E-01
Total PCB Homologs (Det and 1/2 ND)	--	2.09E-02	--	7.49E-03	--	2.41E-01
Total PCB Homologs (Det only)	--	2.09E-02	--	7.49E-03	--	2.41E-01
Dioxin-Like PCBs (TEQ)						
TEQ (Det and 1/2 ND)	--	8.84E-02	--	4.99E-02	--	6.13E-01
TEQ (Det only)	--	8.61E-02	--	4.98E-02	--	5.99E-01

Appendix G
Cost Estimate for Alternatives

Alternative 1 - No Action

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- No action would be taken to address COCs or restrict consumers' exposure to fish and crab from fishing and crabbing activities
- No monitoring would be conducted
- 5-year reviews for 30 years.

Description	Quantity	Unit	$/Unit	Total Cost	Notes
(1) CONSTRUCTION COST	1	LS	$0	$0	NA
(2) DESIGN&CM&PM	1	LS	$0	$0	NA
(3) ANNUAL O&M COST					
Annual O&M Cost	1	LS	$0	$0	NA
O&M Subtotal Cost (NPV)				**$0**	
(4) PERIODIC COST					
4.1 Community Involvement and Notification	16	HR	$125	$2,000	EPA 5-year review process
4.2 Document Review and Analysis	30	HR	$125	$3,750	EPA 5-year review process
4.3 Interviews	20	HR	$125	$2,500	EPA 5-year review process
4.4 Site Inspection	40	HR	$125	$5,000	EPA 5-year review process (2-persons, 1-day; including
4.5 Five-Year-Review Report Preparati	160	HR	$125	$20,000	EPA 5-year review process
4.6 Airfare and Lodging	1	LS	$1,800	$1,800	2-person 1 night
4.7 Project Management	1	LS	$5,258	$5,258	15%
Five-Year-Review Periodic Cost				**$41,000**	

Year	Periodic Cost	Discount Factor	NPV Cost	
0	$ -	1.00	$ -	Year 2012
5	$ 41,000	0.91	$ 37,318	5-year review report
10	$ 41,000	0.74	$ 30,508	5-year review report
15	$ 41,000	0.60	$ 24,473	5-year review report
20	$ 41,000	0.47	$ 19,075	5-year review report
25	$ 41,000	0.38	$ 15,380	5-year review report
30	$ 41,000	0.29	$ 11,933	5-year review report
Total Periodic Cost (NPV)			**$ 139,000**	

(5)TOTAL PROJECT COST (NPV in 2012 $)	**$139,000**	Based on discount rate of 4% for 30 years

Note:

This estimate has been developed and provided as an Order of Magnitude Estimate (ROM)/Budgetary Estimate and as such is suitable for the purpose of budget development and/or planning only. This estimate is offered as an opinion of cost to perform the work and is not an offer to contract for construction services, procure and/or provide such services.

Alternative 2 - Monitored Natural Recovery

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Natural recovery of the ecological system, combined with additional vegetative enhancement
- LTM annual sediment sampling of PCBs lead, and zinc and sediment geochemistry for 5 years
- LUCs (fencing installation around the lagoon and signage and deed notation) to restrict unauthorized access and intursive activities
- 5-year reviews for 30 years.

Description	Quantity	Unit	$/Unit	Total Cost	Notes
(1) Establishing LUC					
1.1 Deed and Boundary Survey	1	LS	$20,000	$20,000	Estimate
1.2 Prepare Deed Recordation Document	1	LS	$10,000	$10,000	Estimate
1.3 Installation of Additional Fence	210	LF	$75	$15,750	6' chain link fence; previous bid (portion of fence already in place)
1.4 Signage for Restricting Access and Intrusive Activities	2	EA	$150	$300	Estimate per similar work (assuming additional 2 signs; two in place)
Subtotal 1				$46,050	
(2) Vegetation Enhancement					
2.1 Moblization and demoblization	1	LS	$20,000	$20,000	Estimate
2.2 Wetland planting and revegetation with native plant species (including materials and labor)	18,750	SF	$1.64	$30,842	Assuming 50% of the 250 ft by 150 ft disturbance area; 2005 EE/CA unit cost escalated to 2012
Escalation Factor			130%		with 30% increase for Vieques
Subtotal 2				$66,095	
CONTINGENCY	20%		$66,095	$14,000	EPA July 2000 guidance
SUBTOTAL - CONSTRUCTION COST				**$127,000**	
(3) DESIGN&CM&PM					
Project Management	10%		$127,000	$12,700	EPA July 2000 guidance page 5-13
Remedial Design	20%		$127,000	$25,400	EPA July 2000 guidance page 5-13
Construction Management	15%		$127,000	$19,050	EPA July 2000 guidance page 5-13
General&Administration (G&A)	9.2%		$127,000	$11,684	RSMeans 5% to 15%
Pollution Liability Insurance	2%		$127,000	$2,540	market price
Payment & Performance Bond	2.5%		$127,000	$3,175	market price
Fee	8%		$138,684	$11,095	
Tax	7%		$127,000	$8,890	Puerto Rico tax
TOTAL - Design &CM&PM				**$86,000**	
TOTAL Capital Cost				**$213,000**	

Alternative 2 - Monitored Natural Recovery

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Natural recovery of the ecological system, combined with additional vegetative enhancement
- LTM annual sediment sampling of PCBs lead, and zinc and sediment geochemistry for 5 years
- LUCs (fencing installation around the lagoon and signage and deed notation) to restrict unauthorized access and intursive activities
- 5-year reviews for 30 years.

Description	Quantity	Unit	$/Unit	Total Cost	Notes
(4) LTM Annual Sediment Sampling and O&M					Assuming 5 locations
4.1 LUC/O&M/LTM Work Plan	1	LS	$15,000	$15,000	Estimate (based on similar plans; allocated to 5
4.2 Sediment Sampling and Inspections	2	Day	$2,000	$4,000	Assuming 1 day for 2-person to sample 5 lagoon locations incluldling sediment deposition thickness measurement; including 1 travel day
4.3 Travel by air	1	Team	$1,600	$1,600	2-person team
4.4 Lodging Per Diem	2	Days	$186	$372	2-person team
4.5 Meal Per Diem per day	4	Days	$57	$228	2-person team (incldluing 1 day travel)
4.6 Car Rental and Fuel	1	Week	$500	$500	2-person team
4.7 Sediment Analysis	6	EA	$350	$2,100	Assuming total 5 sediment samples analyzed for PCBs, lead, and zinc and sediment geochemistry (AVS/SEM metals, TOC, and grain size); 25% QA/QC; estimate based on previous sampling costs
4.8 Reporting	1	LS	$4,000	$4,000	One report in year 5 allocated to 5 events
4.9 General&Administration (G&A)	1	LS	$1,178	$1,178	RSMeans 5% to 15%
Subtotal 4				$28,978	
Contingency	20%			$5,796	
Sediment LTM Cost				**$35,000**	
Sediment LTM Subtotal Cost (NPV)				**$156,000**	5 year at 4%
(5) Periodic Five-Year-Review Cost	1	LS	$139,000	$139,000	5-year review (See Alternative 1)
(6) TOTAL PROJECT COST (NPV in 2012 $)				**$508,000**	Based on discount rate of 4% for 5 years

Note:
This estimate has been developed and provided as an Order of Magnitude Estimate (ROM)/Budgetary Estimate and as such is suitable for the purpose of budget development and/or planning only. This estimate is offered as an opinion of cost to perform the work and is not an offer to contract for construction services, procure and/or provide such services.

Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Additional excavation of remaining contaminated sediment above PRGs (and post-removal confirmatory sampling)
- Dewatering of excavated sediment and disposal in off-site landfill
- Vegetation enhancement after excavation
  - No LUCs since contaminated sediment above PRG is removed
- No five-year review

Description	Quantity	Unit	$/Unit	Total Cost	Notes
(1) CONSTRUCTION COST					
1.1 Mobilization and Demobilization	1	LS	$30,000	$30,000	Estimate
1.2 Temporary Field Facilities	1	LS	$20,000	$20,000	Decon; utilities; sanitary units; dewatering filtration and holding tank
1.3 Installation of Cutoff Berm	1	LS	$1,000	$1,000	Assuming 10 ft (L) x 2 ft (H) x 3 ft (W) earthern berm to isolate the lagoon and pond surface water
1.4 Water Treatment During Initial Lagoon Dewatering	1,225,224	GAL	$0.05	$61,261	130 ft x 120 ft, 3 ft depth; 6 in direct precipitation; applied a safety factor of 3 for surface water/groundwater intrusion; settling tanks and GAC for treatment prior to discharge
1.5 Sump Pumps and Control	6	days	$1,364	$8,184	Assuming total flow 300 gpm; two 3-hp 150-gpm pumps; one pump on-line and operated 24/7 plus 80-ft suction and 300-ft discharge hose; RS Mean adjusted rate: $1,364/day 7 days per week
1.6 Underdrain	500	LF	$60	$30,000	RS Mean
1.7 Effluent Discharge Pipe	500	LF	$8	$4,000	RS Mean; 4" PVC SCH80
1.8 Water Treatment During Sediment Excavation	504,000	GAL	$0.05	$25,200	Dewatering and water treatment system will need to be maintained during the sediment removal (7 days) following initial dewatering. Assuming 50 gpm.
1.9 Erosion Control (Silt Fencing/Hay Bales)	800	LF	$5	$4,000	Assuming perimeter silt fencing during construction
1.10 Mechanical Sediment Removal/Management	1156	CY	$60	$69,333	Estimate per other work
1.11 Sediment Dewatering/Stablization, Reagents & Mixing	1156	CY	$20	$23,111	Estimate per other work
1.12 Off-site Disposal of Dried Sediment (incl. transportation)	1733	Ton	$150	$259,950	Disposal of at Vieques landfill as non-hazardous waste; CTO-196 East Vieques 2009 bid sheet
1.13 Waste Characterization Sampling for Disposal	8	EA	$1,100	$8,800	Assuming 1/250 CY, including 15% of QA/QC; analysis of TCLP, metals, PCBs; previous bid CTO-083
1.14 Confirmation Sediment Sampling and Analysis	13	EA	$330	$4,290	Assuming 1/2500 SF, including 15% of QA/QC; analysis of PCBs, metals; previous bid CTO-083
1.15 Wetland planting and revegetation with native plant species (including materials and labor)	18,750	SF	$1.64	$30,842	Assuming 50% of the 250 ft by 150 ft disturbance area; 2005 EE/CA unit cost escalated to 2012
1.16 Surveys (Pre- and Post-construction)	1	LS	$10,000	$10,000	Estimate
1.17 Demolition of fence	360	LF	$5	$1,800	Estimate
Escalation Factor			130%		with 30% increase for Vieques
SUBTOTAL				**$770,000**	
CONTINGENCY	20%		$770,000	$154,000	EPA July 2000 guidance
SUBTOTAL - CONSTRUCTION COST				**$924,000**	
(2) DESIGN&CM&PM					
Project Management	6%		$924,000	$55,440	EPA July 2000 guidance page 5-13
Remedial Design	12%		$924,000	$110,880	EPA July 2000 guidance page 5-13
Construction Management	8%		$924,000	$73,920	EPA July 2000 guidance page 5-13
General & Administration (G&A)	9.2%		$924,000	$85,008	RSMeans 5% to 15%
Pollution Liability Insurance	2%		$924,000	$18,480	market price
Payment & Performance Bond	2.5%		$924,000	$23,100	market price
Fee	8%		$1,009,008	$80,721	market price
Tax	7%		$924,000	$64,680	Puerto Rico tax
TOTAL - Design &CM&PM				**$513,000**	

Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Additional excavation of remaining contaminated sediment above PRGs (and post-removal confirmatory sampling)
- Dewatering of excavated sediment and disposal in off-site landfill
- Vegetation enhancement after excavation
  - No LUCs since contaminated sediment above PRG is removed
- No five-year review

Description	Quantity	Unit	$/Unit	Total Cost	Notes
TOTAL Capital Cost				**$1,437,000**	
(3) ANNUAL O&M COST				**$0**	
(4) PERODIC COST				**$0**	No five-year review is needed
(5) TOTAL PROJECT COST (NPV in 2012 $)				**$1,437,000**	

Assumptions:
(1) The estiamted total contaminated sediment excavation area is approximately 130 ft x 120 ft; lagoon water depth of 3 ft; assuming additional sediment excavation depth of 2 ft
(2) Total estimated off-site disposal of excavated sediment is assumed 1155 CY (or 1733 tons, assuming 1.5 ton/CY).

Notes:
This estimate has been developed and provided as an Order of Magnitude Estimate (ROM)/Budgetary Estimate and as such is suitable for the purpose of budget development and/or planning only. This estimate is offered as an opinion of cost to perform the work and is not an offer to contract for construction services, procure and/or provide such services.

Alternative 4 - In-situ Sand Capping of Contaminated Sediment

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Passive capping of contaminated sediment area with 2 ft sand to reduce potential risks from uptake of contaminants; vegetation enhancement
- LTM annual sediment sampling of PCBs, lead, and zinc and sediment geochemistry for 10 years
- LUCs (fencing installation around the lagoon and signage and deed notation) to restrict unauthorized access and intursive activities
- 5-year reviews for 30 years.

Description	Quantity	Unit	$/Unit	Total Cost	Notes
(1) Establishing LUC					
1.1 Deed and Boundary Survey	1	LS	$20,000	$20,000	Estimate
1.2 Prepare Deed Recordation Document	1	LS	$10,000	$10,000	Estimate
1.3 Installation of Additional Fence	210	LF	$75	$15,750	6' chain link fence; previous bid (portion of fence already in place)
1.4 Signage for Restricting Access and Intrusive Activities	2	EA	$150	$300	Estimate per similar work (assuming additional 2 signs; two already in place)
Subtotal 1				$46,050	
(2) Vegetation Enhancement					
2.1 Moblization and demoblization	1	LS	$20,000	$20,000	Estimate
2.2 Wetland planting and revegetation with native plant species (including materials and labor)	18,750	SF	$1.64	$30,842	Assuming 50% of the 250 ft by 150 ft disturbance area; 2005 EE/CA unit cost escalated to 2012
Escalation Factor			130%		with 30% increase for Vieques
Subtotal 2				$66,095	
(3) Covering Contaminated Sediment Area with Sand					
3.1 Mobilization and Demobilization	1	LS	$30,000	$30,000	Estimate
3.2 Temporary Field Facilities	1	LS	$5,000	$5,000	utilities; sanitary units; office equipment and supplies
3.3 Erosion Control (Silt Fencing/Hay Bales)	800	LF	$5	$4,000	Assuming downgradient silt fencing during construction; estimate
3.4 Excavation and Staging of 2-ft Sand	1155	CY	$8	$9,240	CTO-196 East Vieques 2009 bid sheet; excavator with operator daily rate $2250 (9 hr/day), assuming excavation rate 30 CY/hr or 270 CY/day
3.5 Import and Place 24" Sand	1155	CY	$20	$23,100	RS Mean 2003 escalated by interest rate of 4%; assuming beach sand available within 6 miles on the island
3.6 Stormwater Control (Riprap)	28	CY	$60	$1,673	Assuming lagoon inlet riprap (50 ft by 30 ft by 6") for tide erosion control; RS Mean 2003 escalated by interest rate of 4%
3.7 Surveys (Pre- and Post-construction)	1	LS	$10,000	$10,000	Estimate
Escalation Factor			130%		with 30% increase for Vieques
Subtotal 3				$107,917	
Subtotal (1+2+3)				**$221,000**	
CONTINGENCY	20%		$221,000	$45,000	EPA July 2000 guidance
SUBTOTAL - CONSTRUCTION COST				**$266,000**	
(4) DESIGN&CM&PM					
Project Management	8%		$266,000	$21,280	EPA July 2000 guidance page 5-13
Remedial Design	15%		$266,000	$39,900	EPA July 2000 guidance page 5-13
Construction Management	10%		$266,000	$26,600	EPA July 2000 guidance page 5-13
General&Administration (G&A)	9.2%		$266,000	$24,472	RSMeans 5% to 15%
Pollution Liability Insurance	2%		$266,000	$5,320	market price
Payment & Performance Bond	1.25%		$266,000	$3,325	market price
Fee	8%		$290,472	$23,238	

Alternative 4 - In-situ Sand Capping of Contaminated Sediment

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Passive capping of contaminated sediment area with 2 ft sand to reduce potential risks from uptake of contaminants; vegetation enhancement
- LTM annual sediment sampling of PCBs, lead, and zinc and sediment geochemistry for 10 years
- LUCs (fencing installation around the lagoon and signage and deed notation) to restrict unauthorized access and intursive activities
- 5-year reviews for 30 years.

Description	Quantity	Unit	$/Unit	Total Cost	Notes
Tax	7%		$266,000	$18,620	Puerto Rico tax
TOTAL - Design &CM&PM				**$145,000**	
TOTAL Capital Cost				**$411,000**	
(5) LTM Annual Sediment Sampling and O&M					Assuming 5 locations
5.1 LUC/O&M/LTM Work Plan	1	LS	$15,000	$15,000	Estimate (based on similar plans; allocated to 5 events)
5.2 Sediment Sampling	2	Day	$2,000	$4,000	Assuming 1 day for 2-person to sample 5 lagoon locations; including 1 travel day
5.3 Travel by air	1	Team	$1,600	$1,600	2-person team
5.4 Lodging Per Diem (per person)	2	Days	$186	$372	2-person team
5.5 Meal Per Diem per day	4	Days	$57	$228	2-person team (incldluing 1 day travel)
5.6 Car Rental and Fuel	1	Week	$500	$500	2-person team
5.7 Sediment Analysis	6	EA	$350	$2,100	Assuming total 5 sediment samples analyzed for PCBs, lead, and zinc and sediment geochemistry (AVS/SEM metals, TOC, and grain size); 25% QA/QC; estimate based on previous sampling costs
5.8 Reporting	1	LS	$2,000	$2,000	One report in year 10 allocated to 10 events
5.9 General&Administration (G&A)	1	LS	$994	$994	RSMeans 5% to 15%
Subtotal 5				$26,794	
Contingency	20%			$5,359	
Sediment LTM Cost				**$33,000**	
Sediment LTM Subtotal Cost (NPV)				**$268,000**	10 year at 4%
(6) Periodic Five-Year-Review Cost	1	LS	$139,000	**$139,000**	5-year reviews for 30 years (See Alternative
(7) TOTAL PROJECT COST (NPV in 2011 $)				**$818,000**	

Assumptions:
(1) The estiamted total contaminated sediment area requiring sand capping is approximately 130 ft x 120 ft;
(2) Total estimated 2-foot sand quantity is assumed 1155 CY (or 1733 tons, assuming 1.5 ton/CY).

Note:
This estimate has been developed and provided as an Order of Magnitude Estimate (ROM)/Budgetary Estimate and as such is suitable for the purpose of budget development and/or planning only. This estimate is offered as an opinion of cost to perform the work and is not an offer to contract for construction services, procure and/or provide such services.

Alternative 5 - In-situ Reactive Capping of Contaminated Sediment

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:

- Capping the contaminated sediment area with CETCO RCM (bleneded orgnao clay and apatite) and 6 inch overlaying sand layer to reduce potential risks from uptake of contaminants; vegetation enhancement
- LTM annual sediment sampling of PCBs, lead, and zinc and sediment geochemistry for 10 years
- LUCs (fencing installation around the lagoon and signage and deed notation) to restrict unauthorized access and intursive activities
- 5-year reviews for 30 years

Description	Quantity	Unit	$/Unit	Total Cost	Notes
(1) Establishing LUC					
1.1 Deed and Boundary Survey	1	LS	$20,000	$20,000	Estimate
1.2 Prepare Deed Recordation Document	1	LS	$10,000	$10,000	Estimate
1.3 Installation of Additional Fence	210	LF	$75	$15,750	6' chain link fence; previous bid (portion of fence already in place)
1.4 Signage for Restricting Access and Intrusive Activities	2	EA	$150	$300	Estimate per similar work (assuming additional 2 signs; two already in place)
Subtotal 1				$46,050	
(2) Vegetation Enhancement					
2.1 Moblization and demoblization	1	LS	$20,000	$20,000	Estimate
2.2 Wetland planting and revegetation with native plant species (including materials and labor)	18,750	SF	$1.64	$30,842	Assuming 50% of the 250 ft by 150 ft disturbance area; 2005 EE/CA unit cost escalated to 2012
Escalation Factor			130%		with 30% increase for Vieques
Subtotal 2				$66,095	
(3) Capping Contaminated Sediment Area with RCM and Sand					
3.1 Mobilization and Demobilization	1	LS	$30,000	$30,000	Estimate
3.2 Temporary Field Facilities	1	LS	$5,000	$5,000	utilities; sanitary units; office equipment and supplies
3.3 Erosion Control (Silt Fencing/Hay Bales)	800	LF	$5	$4,000	Assuming perimeter silt fencing during construction;Estimate
3.4 Installation of RCM (blended organo clay and apatite) including labor and material	15600	SF	$4	$62,400	vendor estimate
3.5 Excavation and Staging of 6-inch Sand	289	CY	$8	$2,311	CTO-196 East Vieques 2009 bid sheet; excavator with operator daily rate $2250 (9 hr/day), assuming excavation rate 30 CY/hr or 270 CY/day
3.6 Import and Place 6" Sand	289	CY	$20	$5,778	RS Mean 2003 escalated by interest rate of 4%; assuming beach sand available within 6 miles on the island
3.7 Stormwater Control (Inlet Riprap)	28	CY	$60	$1,673	Assuming lagoon inlet riprap (50 ft by 30 ft by 6") for tide erosion control; RS Mean 2003 escalated by interest rate of 4%
3.8 Surveys (Pre- and Post-construction)	1	LS	$10,000	$10,000	Estimate
Escalation Factor			130%		with 30% increase for Vieques
Subtotal 3				$157,510	
Subtotal (1+2+3)				**$270,000**	
CONTINGENCY	20%		$270,000	$54,000	EPA July 2000 guidance
SUBTOTAL - CONSTRUCTION COST				**$324,000**	
(4) DESIGN&CM&PM					
Project Management	8%		$324,000	$25,920	EPA July 2000 guidance page 5-13
Remedial Design	15%		$324,000	$48,600	EPA July 2000 guidance page 5-13
Construction Management	10%		$324,000	$32,400	EPA July 2000 guidance page 5-13
General&Administration (G&A)	9.2%		$324,000	$29,808	RSMeans 5% to 15%
Pollution Liability Insurance	2%		$324,000	$6,480	market price

Alternative 5 - In-situ Reactive Capping of Contaminated Sediment

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:

- Capping the contaminated sediment area with CETCO RCM (bleneded orgnao clay and apatite) and 6 inch overlaying sand layer to reduce potential risks from uptake of contaminants; vegetation enhancement
- LTM annual sediment sampling of PCBs, lead, and zinc and sediment geochemistry for 10 years
- LUCs (fencing installation around the lagoon and signage and deed notation) to restrict unauthorized access and intursive activities
- 5-year reviews for 30 years

Description	Quantity	Unit	$/Unit	Total Cost	Notes
Payment & Performance Bond	1.25%		$324,000	$4,050	market price
Fee	8%		$353,808	$28,305	
Tax	7%		$324,000	$22,680	Puerto Rico tax
TOTAL - Design &CM&PM				**$176,000**	
TOTAL Capital Cost				**$500,000**	
(5) LTM Annual Sediment Sampling and O&M					Assuming 5 locations
5.1 LUC/O&M/LTM Work Plan	1	LS	$15,000	$15,000	Estimate (based on similar plans; allocated to 5 events)
5.2 Sediment Sampling	2	Day	$2,000	$4,000	Assuming 1 day for 2-person ; including 1 travel day
5.3 Travel by air	1	Team	$1,600	$1,600	2-person team
5.4 Lodging Per Diem (per person)	2	Days	$186	$372	2-person team
5.5 Meal Per Diem per day	2	Days	$57	$114	2-person team (inclduing 1 day travel)
5.6 Car Rental and Fuel	1	Week	$500	$500	2-person team
5.7 Sediment Analysis	6	EA	$350	$2,100	Assuming total 5 sediment samples analyzed for PCBs, lead, and zinc and sediment geochemistry (AVS/SEM metals, TOC, and grain size); 25% QA/QC; estimate based on previous sampling costs
5.8 Reporting	1	LS	$2,000	$2,000	One report in year 10 allocated to 10 events
5.9 General&Administration (G&A)	1	LS	$983	$983	RSMeans 5% to 15%
Subtotal 5				$26,669	
Contingency	20%			$5,334	
Sediment LTM Cost				**$33,000**	
Sediment LTM Subtotal Cost (NPV)				**$268,000**	10 year at 4%
(6) Periodic Five-Year-Review Cost	1	LS	$139,000	**$139,000**	5-year reviews for 30 years (See Alternative
(7) TOTAL PROJECT COST (NPV in 2011 $)				**$907,000**	

Assumptions:
(1) The estiamted total contaminated sediment area requiring RCM capping is approximately 130 ft x 120 ft;
(2) Total estimated 6-inch sand quantity is assumed 290 CY (or 435 tons, assuming 1.5 ton/CY).

Note:
This estimate has been developed and provided as an Order of Magnitude Estimate (ROM)/Budgetary Estimate and as such is suitable for the purpose of budget development and/or planning only. This estimate is offered as an opinion of cost to perform the work and is not an offer to contract for construction services, procure and/or provide such services.

Alternative 6 - Intertidal Forested Wetland Restoration and LUCs

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Covering the entire SWMU 6 lagoon with 3 ft of soil up to historical grade to eliminate exposure pathways
- Vegetation enhancement to restore the site to original (intermittently inundated) black mangrove habitat conditions
- LUCs (survey and deed notation) to restrict unauthorized excavation to return the site back into a lagoon due to the presence of contaminated sediment beneath the cover (no fence because the site would be suitable for unrestricted use after covering)
- Five-year reviews for 30 years.

Description	Quantity	Unit	$/Unit	Total Cost	Notes
(1) Lagoon Dewatering					
1.1 Mobilization and Demobilization	1	LS	$30,000	$30,000	Estimate
1.2 Temporary Field Facilities	1	LS	$20,000	$20,000	change and decon; utilities; sanitary units; dewatering filtration and holding tank
1.3 Installation of Cutoff Berm	1	LS	$1,000	$1,000	assming 10 ft (L) x 2 ft (H) x 3 ft (W) earthern berm to isolate the lagoon and pond surface water
1.4 Water Treatment During Initial Lagoon Dewatering	816,816	GAL	$0.05	$40,841	130 ft by 120 ft, 3 ft depth; 6" direct precipitation plus rain/storm/tidal with a safety factor of 2; Settling Tanks and GAC for treatment prior to discharge
1.5 Sump Pumps and Control - 100 gpm	6	days	$1,364	$8,184	Assuming total flow 300 gpm; two 3-hp 150-gpm pumps; One pump on-line and operated 24/7 plus 80-ft suction and 300-ft discharge hose; RSMeans adjusted rate: $1,364/day 7 days per week
1.6 Underdrain	500	LF	$60	$30,000	RS Mean
1.7 Effluent Discharge Pipe	500	LF	$8	$4,000	RS Mean; 4" PVC SCH80
1.8 Water Treatment During Sediment Covering	504,000	GAL	$0.05	$25,200	Dewatering and water treatment system will need to be maintained during the sediment covering (7 days) following initial dewatering. Assuming 50 gpm.
1.9 Erosion Control (Silt Fencing/Hay Bales)	800	LF	$5	$4,000	Assuming perimeter silt fencing during construction;Estimate
1.10 Demolition of fence	360	LF	$5	$1,800	Estimate
Escalation Factor			130%		with 30% increase for Vieques
SUBTOTAL				$215,000	
CONTINGENCY	20%		$215,000	$43,000	EPA July 2000 guidance
Subtotal 1 - Lagoon Dewatering				**$258,000**	
(2) Filling-in and Covering lagoon With Soil					
2.1 Mobilization and Demobilization	1	LS	$30,000	$30,000	Estimate
2.2 Pre-construction Survey	1	LS	$5,000	$5,000	Estimate
2.3 Temporary Field Facilities	1	LS	$15,000	$15,000	Office, change and decon trailers; utilities; sanitary units; office equipment and supplies
2.4 Erosion Control (Silt Fencing/Hay Bales)	800	LF	$5	$4,000	Assuming perimeter silt fencing during construction;Estimate
2.5 Backfill/Compaction/Regrading with Fill	3200	LCY	$12	$38,714	Backfill Compaction factor of 1.2;RS Mean 2003 escalated by interest rate of 4% ; Unclassified Fill on the island, 6" lifts, Off-site, include delivery, spreading and compaction; assuming average 3 ft thick to bring to current grade
2.6 Import and Place 6" Top Soil	533	LCY	$16	$8,542	Top soil compaction factor of 1.2;RS Mean 2003 escalated by interest rate of 4%; Off-site top soil 6" Lifts within 6 miles on the island; $5/CY for backfilling
2.7 Borrow Area Restoration	1	Acres	$709	$709	RS Mean 2003 escalated by interest rate of 4%;hydroseeding
2.8 Revegetation with native plant species (including materials and labor)	24,000	SF	$1.64	$39,478	200 ft by 120 ft area; 2005 EE/CA unit cost escalated to 2012

Alternative 6 - Intertidal Forested Wetland Restoration and LUCs

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) — Base Year: 2012
Location: Vieques, Puerto Rico — Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Covering the entire SWMU 6 lagoon with 3 ft of soil up to historical grade to eliminate exposure pathways
- Vegetation enhancement to restore the site to original (intermittently inundated) black mangrove habitat conditions
- LUCs (survey and deed notation) to restrict unauthorized excavation to return the site back into a lagoon due to the presence of contaminated sediment beneath the cover (no fence because the site would be suitable for unrestricted use after covering)
- Five-year reviews for 30 years.

Description	Quantity	Unit	$/Unit	Total Cost	Notes
2.9 Stormwater Control (Perimeter Riprap and interio drainage)	65	LCY	$60	$3,903	Perimeter riprap (700 ft by 5 ft by 6") for run-on and run-off control; add SF of 2 for interio drainage;RS Mean 2003 escalated by interest rate of 4%
2.10 Post-construction Topographic Survey	1	LS	$5,000	$5,000	Estimate
Escalation Factor			130%		with 30% increase for Vieques
Subtotal 2				**$195,450**	
(3) Establishing LUC					
3.1 Deed and Boundary Survey	1	LS	$20,000	$20,000	Estimate
3.2 Prepare Deed Recordation Document	1	LS	$10,000	$10,000	Estimate
1.3 Installation of Additional Fence	0	LF	$13.9	$0	Not needed
1.4 Signage for Restricting Access and Intrusive Activities	2	EA	$150	$300	Estimate per similar work (assuming additional 2 signs; two in place)
Subtotal 3				$30,300	
Subtotal (1+2+3)				**$484,000**	
CONTINGENCY	20%		$484,000	$97,000	EPA July 2000 guidance
SUBTOTAL - CONSTRUCTION COST				**$581,000**	
(4) DESIGN&CM&PM					
Project Management	8%		$581,000	$46,480	EPA July 2000 guidance page 5-13
Remedial Design	15%		$581,000	$87,150	EPA July 2000 guidance page 5-13
Construction Management	10%		$581,000	$58,100	EPA July 2000 guidance page 5-13
General&Administration (G&A)	9.2%		$581,000	$53,452	RSMeans 5% to 15%
Pollution Liability Insurance	2%		$581,000	$11,620	market price
Payment & Performance Bond	1.25%		$581,000	$7,263	market price
Fee	8%		$634,452	$50,756	
Tax	7%		$581,000	$40,670	Puerto Rico tax
TOTAL - Design &CM&PM				**$315,000**	

Alternative 6 - Intertidal Forested Wetland Restoration and LUCs

(Accuracy Range: +50% / -30%)

Site: SWMU 6, Former Naval Ammunition Support Detachment (NASD) Base Year: 2012
Location: Vieques, Puerto Rico Date: December, 2012
Phase: Feasibility Study (FS)
Alternative Description:
- Covering the entire SWMU 6 lagoon with 3 ft of soil up to historical grade to eliminate exposure pathways
- Vegetation enhancement to restore the site to original (intermittently inundated) black mangrove habitat conditions
- LUCs (survey and deed notation) to restrict unauthorized excavation to return the site back into a lagoon due to the presence of contaminated sediment beneath the cover (no fence because the site would be suitable for unrestricted use after covering)
- Five-year reviews for 30 years.

Description	Quantity	Unit	$/Unit	Total Cost	Notes
TOTAL Capital Cost				**$896,000**	
(5) Periodic Five-Year-Review Cost	1	LS	$139,000	$139,000	5-year review (See Alternative 1)
(6) TOTAL PROJECT COST (NPV in 2012 $)				**$1,035,000**	

Assumptions:
(1) The estiamted total lagoon area requiring 3 ft of soil covering is approximately 200 ft x 120 ft;
(2) Total estimated soil quantity is assumed 3200 CY (or 4800 tons, assuming 1.5 ton/CY) considering backfill compaction factor of 1.2.

Note:
This estimate has been developed and provided as an Order of Magnitude Estimate (ROM)/Budgetary Estimate and as such is suitable for the purpose of budget development and/or planning only. This estimate is offered as an opinion of cost to perform the work and is not an offer to contract for construction services, procure and/or provide such services.

Appendix H
Sustainability Analysis Summary

APPENDIX H

Sustainability Analysis for SWMU 6

1.1 Introduction

This appendix presents the approach taken and results obtained from a sustainability analysis that CH2M HILL performed for SWMU 6, Former Naval Ammunition Support Detachment (NASD), Vieques, Puerto Rico. SWMU 6 is the Former Mangrove Disposal Site, located in a mangrove swamp between two tidally influenced lagoons of the Laguna Kiani complex, along Highway 200. The site was used for the disposal of general solid waste during the 1960s and 1970s from Navy operations within the former NASD. The site environmental setting was originally terrestrial (intermittently inundated black mangrove habitat), but an interim removal action in 2009 resulted in creating a shallow marine lagoon environment, approximately 5 inches to 3 feet in depth less than 0.6 acre. The post-removal human health risk assessment (HHRA) contained in the Feasibility Study Report identified one Chemical of Concern (COC): PCBs in fish/crab, which presents unacceptable risks under a hypothetical fish/crab consumption scenario. The COC in biota samples is likely attributed by PCBs in sediments via uptake and bioaccumulation. Risks to ecological receptors are considered acceptable under current site conditions for all areas, media, and exposure pathways except for SWMU 6 lagoon sediment. Cadmium, copper, lead, and zinc were identified as COCs in SWMU 6 lagoon sediment due to concern for direct exposures to lower trophic level receptors. The fish/crab sampling confirmed that the benthic community is not impaired by site-related contaminants which would adversely affect upper-trophic-level populations that rely on it as a food source.

Remedial alternatives were developed in the FS Report to address the potentially unacceptable risk for human consummation of fish and crabs.

1.2 Methodology

This sustainability analysis was performed by CH2M HILL using SiteWise™, a tool developed jointly by Battelle, U.S. Navy, and U.S. Army Corps of Engineers (USACE). This analysis evaluates the environmental footprint of each remedial alternative considered in terms of five metrics, including:

1. Greenhouse gases (GHGs) reported as carbon dioxide equivalents (CO_2e), consisting of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O)
2. Energy usage (expressed as British Thermal Unit [BTU])
3. Water consumption (gallons)
4. Air emissions of criteria pollutants consisting of oxides of nitrogen (NOx) and sulfur (SOx), and particulate matter (PM)
5. Accident risk (risk of injury and risk of fatality)

SiteWise™ uses footprint factors taken out of various emission factors from governmental or non-governmental research sources to determine the environmental footprint of each activity. The assessment is carried out using a spreadsheet-based building block approach, where every remedial alternative is first broken down into modules that mimic the remedial phases in most remedial actions, including remedial investigation (RI), remedial action constructions (RAC), remedial action operation (RAO), and long-term monitoring (LTM). Since all the alternatives evaluated for SWMU 6 do not contain RI and typical annual operation and maintenance activities involved for conventional remedial systems, the RI and RAO modules are not used. Instead, site inspection activities involved during the periodic five-year review site visits and periodic sediment sampling activities are evaluated in the LTM module. To estimate the sustainability footprint for each remedial alternative, only those elements of remedial construction and long-term monitoring considered to posses important sustainability elements were included in the assessment. Once broken down into various modules, the footprint of each module is individually calculated. The different footprints are then combined to estimate the overall footprint of the remedial alternative. A low environmental footprint indicates low deleterious impacts to environmental and social metrics, which collectively make up the SiteWise™ sustainability metrics. Conversely, a high environmental footprint indicates high

deleterious impacts associated with the SiteWise™ metrics. The major conclusions of this sustainability analysis are incorporated into the short-term effectiveness criteria evaluation of the FS Report. The following sections present the assumptions and major conclusions of sustainability analysis.

1.3 Alternatives Evaluated and Assumptions

The Alternatives identified in the FS Report consist of:

- Alternative 1—*No Action*
- Alternative 2— *Monitored Natural Recovery and Land Use Controls*
- Alternative 3— *Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment*
- Alternative 4— *In-situ Sand Capping of Contaminated Sediment, Long-Term Monitoring, and Land Use Controls*
- Alternative 5— *In-situ Reactive Capping of Contaminated Sediment, Long-Term Monitoring, and Land Use Controls*
- Alternative 6— *Intertidal Forested Wetland Restoration and Land Use Controls*

1.4 Assumptions

The following assumptions were used for the SiteWise™ tool evaluation:

- Remedial Construction: transportation of personnel (road and air) and equipment for construction efforts involving establishing IC/LUC (including fencing and boundary survey), lagoon dewatering, sediment excavation and off-site disposal, sediment capping, or soil covering.
  - Remedial construction is not applicable for Alternative 1, since no action is taken
  - Alternative 2 involves establishing IC/LUC (including fencing and boundary survey)
  - Alternative 3 involves establishing dewatering and sediment excavation and off-site disposal
  - Alternative 4 involves establishing IC/LUC (including fencing and boundary survey), and in-situ capping of sediment with 2 feet of sand
  - Alternative 5 involves establishing IC/LUC (including fencing and boundary survey), and in-situ capping of sediment with a Reactive Core Matt (RCM) and 0.5 feet of sand
  - Alternative 6 involves covering the lagoon with soil (assuming 3 feet) to restore the site to intertidal mangrove habitat condition and establishing IC/LUC (including fencing and boundary survey)
- Long-term Monitoring: transportation of personnel for five-year-review site visits and annual sediment sampling.
  - Alternatives 1 and 6 involve five-year reviews for 30 years
  - Alternative 2 involves annual sediment sampling for 5 years and five-year reviews for 30 years
  - Alternatives 4 and 5 involves annual sediment sampling for 10 years and five-year reviews for 30 years
  - LTM and five-year reviews are not needed for Alternative 3 because the contaminated sediment above PRGs would be removed

1.5 Results and Conclusions

A comparative analysis for the alternatives is summarized in **Figure H-1**. The environmental footprint in terms of GHG, NOx, SOx, PM10 emissions, and total energy used followed the overall order (low to highest): Alternative 1 < Alternative 2 < Alternative 4 < Alternative 5 < Alternative 6 < Alternative 3. Accident risks for fatality and injury followed the overall order (low to highest), with the exception of Alternative 4: Alternative 1 < Alternative 2 < Alternative 5 < Alternative 6 < Alternative 4 < Alternative 3.

It should be noted that while this analysis compares the environmental footprints of each of the six alternatives, the six alternatives provide different end-points of remedial performance. Therefore, a comparison of the results of the five alternatives needs to be made in the context of the benefits (e.g., ARAR compliance, contaminant reduction, cost effectiveness, and etc.) of each of the alternatives.

Table H-1 presents the quantitative environmental footprint metrics evaluated for each remedial alternative. **Table H-2** provides a relative impact of environmental footprint metrics evaluated for each remedial alternative. The environmental footprint for each alternative is discussed below.

Alternative 1 had the lowest footprint among all of the alternatives considered (**Tables H-1 and H-2).** Even though this alternative has the lowest environmental footprint and potential accident risk, this alternative is not protective of the human health and environment. As shown on **Figure H-2**, environmental footprint and potential accident risk are primarily associated with personnel transportation during the site inspections for the five-year reviews.

Alternative 2 produced the second lowest footprint after Alternative 1 (**Tables H-1 and H-2**). As shown on **Figure H-3,** the GHG, NOx, SOx, and PM10 emissions and energy consumption were primarily driven by the personnel transportation activities during the long-term monitoring period, including periodic sediment sampling, and the 5-year reviews; The personnel transportation during the RA construction (fence installation and boundary survey) accounts for approximately one third of the GHG, NOx, SOx, and PM10 emissions and energy consumption. The potential accident risk for this alternative is the second lowest.

Alternative 3 produced the highest footprint (**Tables H-1 and H-2**). As shown on **Figure H-4,** the GHG, NOx, SOx, and PM10 emissions and energy consumption were primarily driven by the by the equipment use activities associated with lagoon dewatering, sediment excavation, and off-site disposal of Remedial Action Construction phase. The alternative involves significant water disposal, primarily driven by the dewatering of the lagoon. Equipment usage was also the major factors for accident risk that results in the potential for fatality and injury. The potential accident risk for this alternative is the highest.

Alternative 4 produced the third lowest footprint in terms of GHG, NOx, SOx, and PM10 emissions (**Tables H-1 and H-2**). The energy consumption was the highest primarily driven by personnel transportation during 10-year LTM and 30-year five-year reviews. As shown on **Figure H-5,** the emissions except for PM10 were primarily driven by personnel transportation activities during the long-term monitoring period, including periodic sediment sampling, and the 5-year review. The PM10 is primarily driven by installation of sand covering during the Remedial Construction phase. The energy consumption was driven by personnel transportation during both the remedial action construction and long-term monitoring periods. Equipment usage during the RA construction and long-term monitoring was major factors for accident risk that results in the potential for fatality and injury. The potential accident risk for this alternative is the second highest.

Alternative 5 produced the third highest footprint in terms of GHG, NOx, SOx, and PM10 emissions (**Tables H-1 and H-2**). The energy consumption was the second highest primarily driven by personnel transportation during 10-year LTM and 30-year five-year reviews. As shown on **Figure H-6,** the emissions except for PM10 were primarily driven by personnel transportation activities during the long-term monitoring period, including periodic sediment sampling, and the 5-year review. The PM10 is primarily driven by installation of 6-inch sand covering during the Remedial Construction phase. The energy consumption was driven by personnel transportation during both the remedial action construction and long-term monitoring periods. Equipment usage during the RA construction and long-term monitoring was major factors for accident risk that results in the potential for fatality and injury. The potential accident risk for this alternative is the third highest.

Alternative 6 produced the second highest footprint after Alternative 3 ((**Tables H-1 and H-2**). As shown on **Figure H-7,** the emissions and energy consumptions were primarily driven by the equipment use activities associated with lagoon dewatering, and soil covering activities of Remedial Construction phase. The alternative involves significant water disposal, primarily driven by the dewatering of the lagoon. Equipment usage during the remedial construction period was the major factor for accident risk that results in the potential for fatality and injury. The potential accident risk for this alternative is the third highest.

Table H-1

Sustainability Analysis Metrics Quantified for Alternatives
SWMU 6 Feasibility Study Report
Former (NASD), Vieques, Puerto Rico

Remedial Alternatives	GHG Emissions (metric ton)	Total Energy Used (MMBTU)	Water Consumption (gallons)	NOx Emissions (metric ton)	SOx Emissions (metric ton)	PM10 Emissions (metric ton)	Accident Risk Fatality	Accident Risk Injury
Alt 1	7.73	1.03E+02	0.00E+00	2.13E-02	2.09E-03	1.37E-04	5.62E-06	1.40E-03
Alt 2	16.87	2.25E+02	0.00E+00	4.61E-02	4.53E-03	3.01E-04	2.13E-05	2.96E-03
Alt 3	196.18	1.66E+02	7.16E+02	3.94E-01	1.85E-01	4.71E-03	1.21E-04	2.56E-02
Alt 4	27.18	3.65E+02	0.00E+00	7.61E-02	7.97E-03	9.12E-04	7.81E-05	1.54E-02
Alt 5	26.78	3.59E+02	0.00E+00	7.40E-02	7.47E-03	6.36E-04	5.74E-05	1.05E-02
Alt 6	156.58	2.25E+02	7.16E+02	3.30E-01	1.45E-01	4.08E-03	6.42E-05	1.37E-02

TABLE H-2

Relative Impact for Sustainability Analysis Metrics Quantified for Alternatives

SWMU 6 Feasibility Study Report

Former (NASD), Vieques, Puerto Rico

Remedial Alternatives	GHG Emissions	Energy Usage	Water Usage	NOx emissions	SOx Emissions	PM10 Emissions	*Accident Risk Fatality	*Accident Risk Injury
Alt 1	Low	Low	Low	Low	Low	Low	Low	Low
Alt 2	Low	Medium	Low	Low	Low	Low	Low	Low
Alt 3	High	Medium	High	High	High	High	High	High
Alt 4	Low	High	Low	Low	Low	Low	Medium	Medium
Alt 5	Low	High	Low	Low	Low	Low	Medium	Medium
Alt 6	High	Medium	High	High	High	High	Medium	Medium

FIGURE H-1
Comparative Analysis of Sustainability Metrics – All Alternatives
SWMU 6 Feasibility Study Report
Former (NASD), Vieques, Puerto Rico

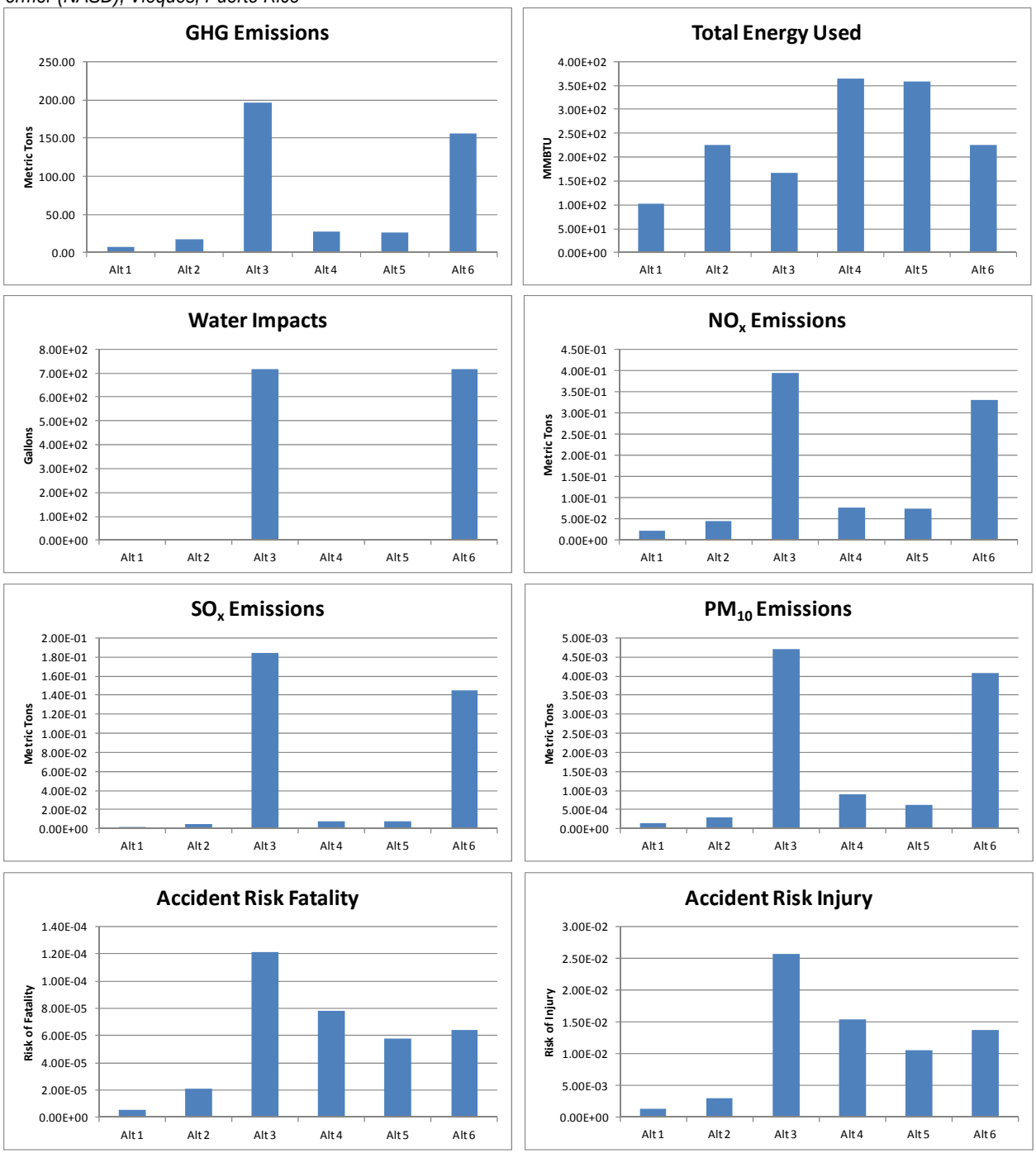


FIGURE H-2
Environmental Footprint Summary – Alternative 1
SWMU 6 Feasibility Study Report
Former (NASD), Vieques, Puerto Rico

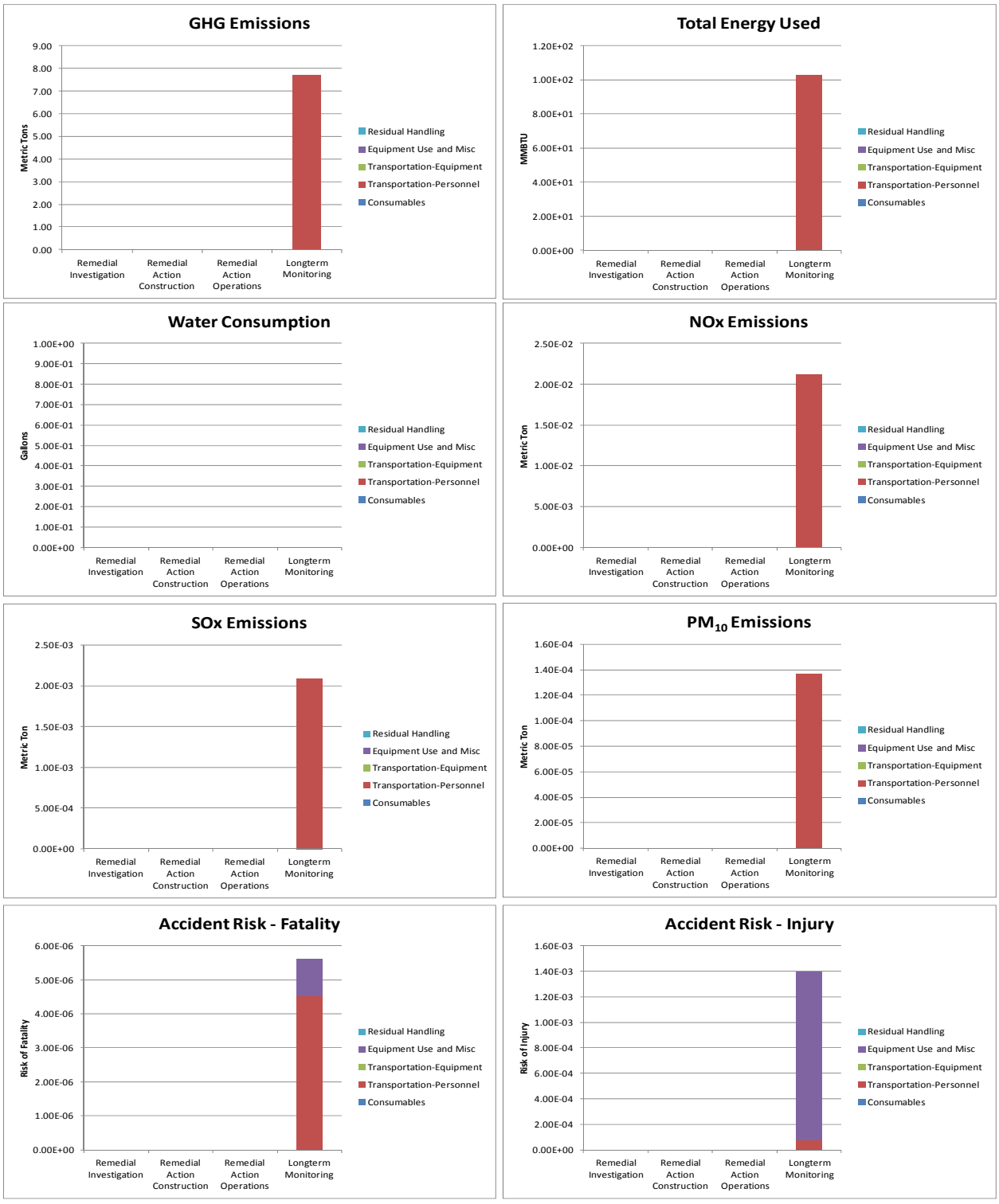


FIGURE H-3
Environmental Footprint Summary – Alternative 2
SWMU 6 Feasibility Study Report
Former (NASD), Vieques, Puerto Rico

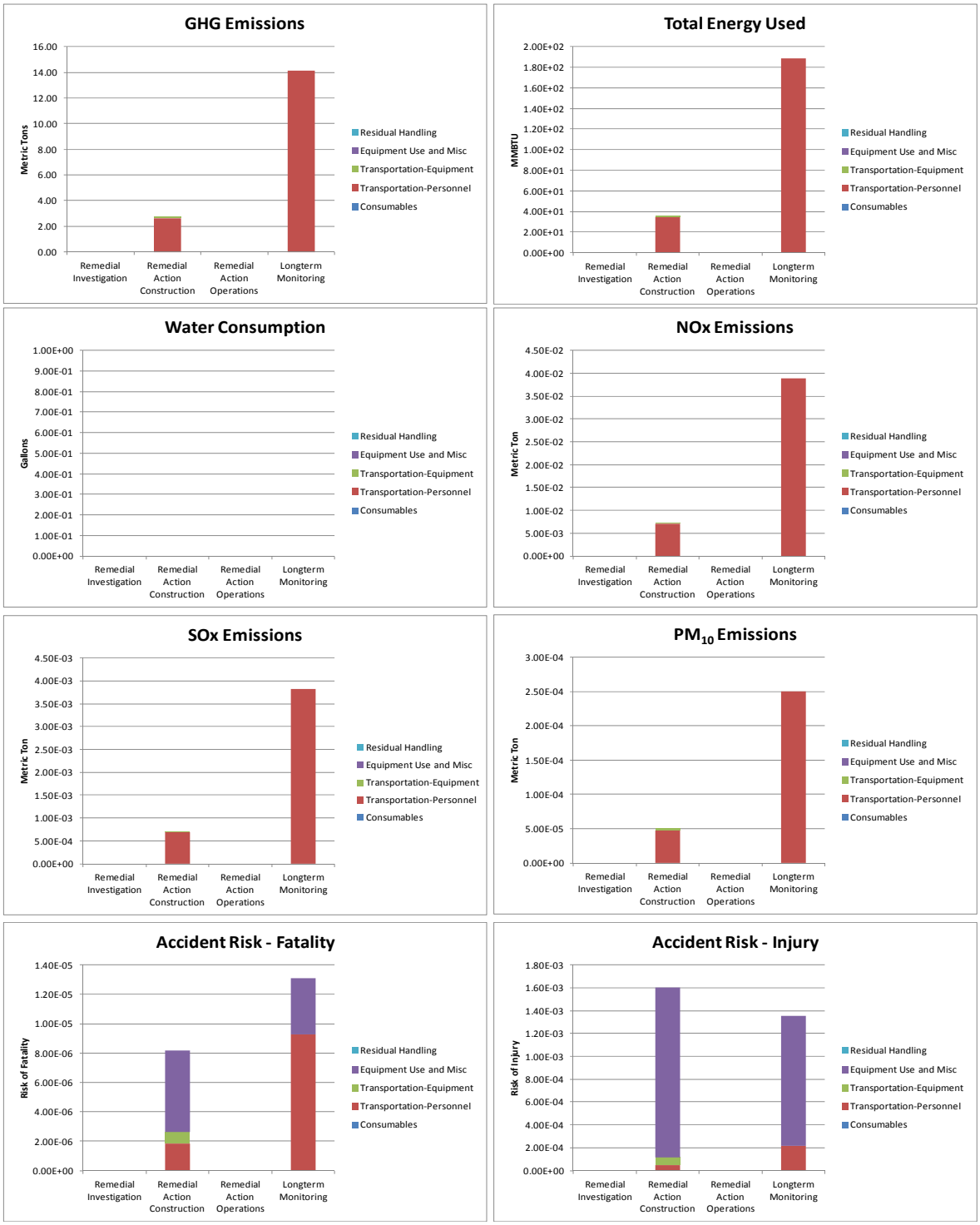


FIGURE H-4
Environmental Footprint Summary – Alternative 3
SWMU 6 Feasibility Study Report
Former (NASD), Vieques, Puerto Rico

FIGURE H-5
Environmental Footprint Summary – Alternative 4
SWMU 6 Feasibility Study Report
Former (NASD), Vieques, Puerto Rico

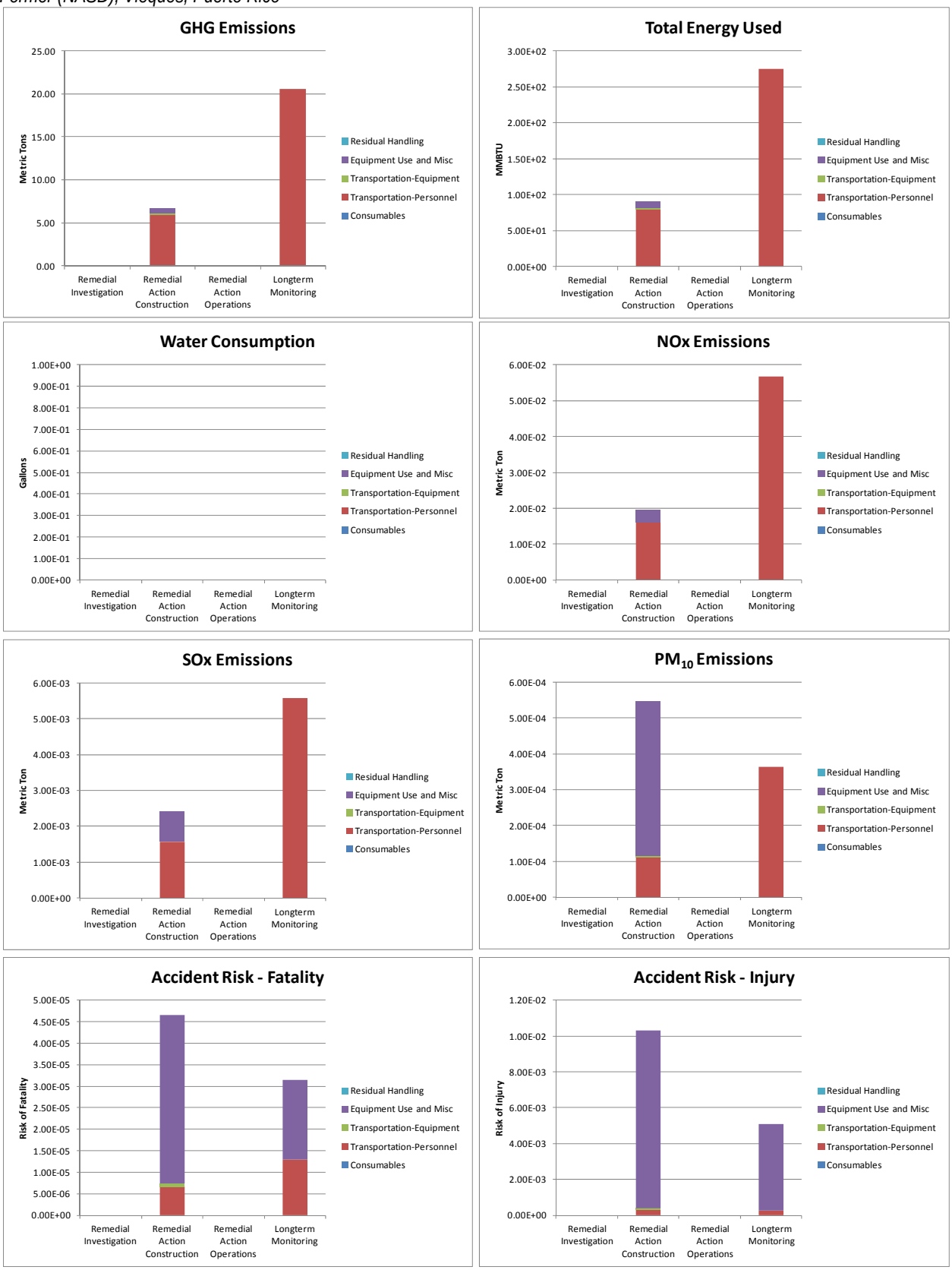


FIGURE H-6
Environmental Footprint Summary – Alternative 5
SWMU 6 Feasibility Study Report
Former (NASD), Vieques, Puerto Rico

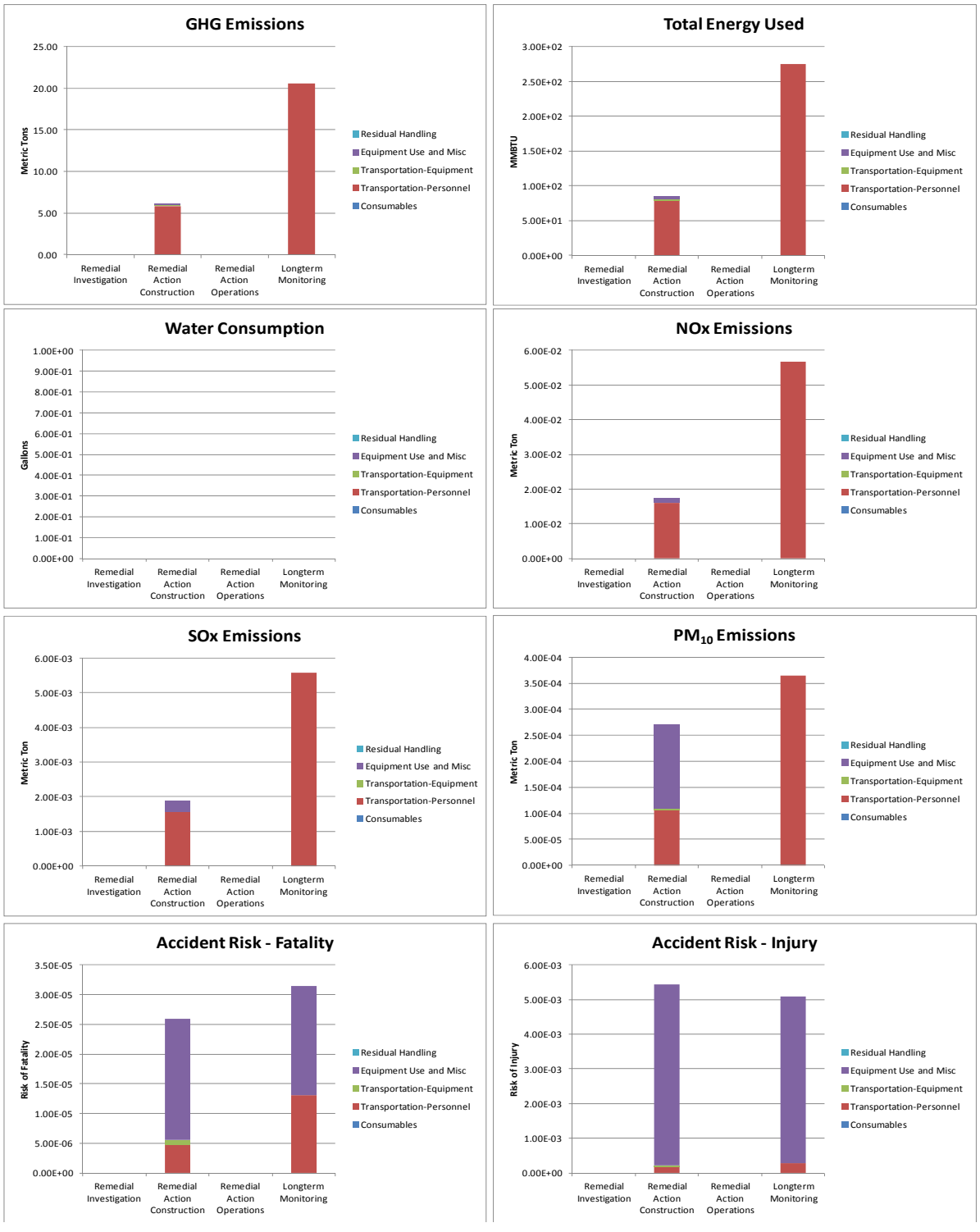


FIGURE H-7
Environmental Footprint Summary – Alternative 6
SWMU 6 Feasibility Study Report
Former (NASD), Vieques, Puerto Rico

SiteWise™ Tool Input Sheets (Attached)

SITE INFORMATION	
User Name and Date	K.T. 05/01/2012
Site Name	SWMU 6, Vieques
Remedial Alternative Name	No Action
Alternative File Name (will be used in graphics and as file name; avoid invalid characters, e.g. ? : " / \ < > | * _)	Alt 1
Choose electricity region	FRCC

Do you want to reload a previously saved remedial alternative in the SiteWise input sheet?

RA_Alt 1_NoFR_1 C:\Documents a ▼ Yes Refresh List

Reset all input values on all worksheets to default

Reset All Values on All Sheets

-= Status =-

Done Loading!

Battelle
The Business of Innovation

U.S.ARMY

SiteWise™ Tool for Green and Sustainable Remediation has been developed jointly by United States (US) Navy, United States Army Corps of Engineers (USACE), and Battelle. This tool is made available on an as-is basis without guarantee or warranty of any kind, express or implied. The US Navy, USACE, Battelle, the authors, and the reviewers accept no liability resulting from the use of this tool or its documentation; nor does the above warrant or otherwise represent in any way the accuracy, adequacy, efficacy, or applicability of the contents hereof. Implementation of SiteWise™ tool and interpretation or use of the results provided by the tool are the sole responsibility of the user. The tool is provided free of charge for everyone to use, but is not supported in any way by the US Navy, USACE, or Battelle.

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

LONGTERM MONITORING COST AND DURATION	Entire Site
Input total longterm monitoring cost ($)	
Input duration of longterm monitoring (unit time)	1.0

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

5-year review 30 years

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Light truck	Cars	Cars	Cars	Cars	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20					
Input number of trips taken	6					
Input number of travelers	1					
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						

*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000					
Input number of travelers	2					
Input number of flights taken	6					

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.						
Input weight of equipment transported per truck load (tons)						

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)						
Input weight of load (tons)						

EQUIPMENT USE

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)						

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	0	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area (ft2)						
Input time available (work days)						

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	240					

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)						

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

SITE INFORMATION	
User Name and Date	K.T. 05/01/2012
Site Name	SWMU 6, Vieques
Remedial Alternative Name	MNR
Alternative File Name (will be used in graphics and as file name; avoid invalid characters, e.g. ? : " / \ < > | * _)	Alt 2
Choose electricity region	FRCC

Do you want to reload a previously saved remedial alternative in the SiteWise input sheet?

RA_Alt 2_NoFR_2 C:\Documents a ▼ Yes Refresh List

Reset all input values on all worksheets to default

Reset All Values on All Sheets

-= Status =-

Done Loading!

Battelle
The Business of Innovation

U.S.ARMY

SiteWise™ Tool for Green and Sustainable Remediation has been developed jointly by United States (US) Navy, United States Army Corps of Engineers (USACE), and Battelle. This tool is made available on an as-is basis without guarantee or warranty of any kind, express or implied. The US Navy, USACE, Battelle, the authors, and the reviewers accept no liability resulting from the use of this tool or its documentation; nor does the above warrant or otherwise represent in any way the accuracy, adequacy, efficacy, or applicability of the contents hereof. Implementation of SiteWise™ tool and interpretation or use of the results provided by the tool are the sole responsibility of the user. The tool is provided free of charge for everyone to use, but is not supported in any way by the US Navy, USACE, or Battelle.

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

REMEDIAL ACTION CONSTRUCTION COST	Entire Site
Input total remedial action construction cost ($)	

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

LUC/Deed Survey (1 da; Fence Installation (2 day; Revegetation (1 day)
same mobilization as fence installation

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Light truck	Light truck	Light truck	Cars	Cars	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20	20	20			
Input number of trips taken	1	2	1			
Input number of travelers	1	1	1			
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						

*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000	3,000				
Input number of travelers	2	2				
Input number of flights taken	1	1				

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.		100				
Input weight of equipment transported per truck load (tons)		0.53				

fence and post (5 lb/ft); 210 LF

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)		50				
Input weight of load (tons)		0.53				

EQUIPMENT USE

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)						

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	0	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area (ft2)						
Input time available (work days)						

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	20.0	40.0	20.0			

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)						

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

LONGTERM MONITORING COST AND DURATION	Entire Site
Input total longterm monitoring cost ($)	
Input duration of longterm monitoring (unit time)	1.0

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

5-year review
6 events

Annual sediment LTM
5 events

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Cars	Cars	Cars	Cars	Cars	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20		20			
Input number of trips taken	6		5			
Input number of travelers	2		1			
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						
*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.						

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000		3,000			
Input number of travelers	2		2			
Input number of flights taken	6		5			

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.						
Input weight of equipment transported per truck load (tons)						

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)						
Input weight of load (tons)						

EQUIPMENT USE

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)						

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	0	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area (ft2)						
Input time available (work days)						

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	40		40.0			

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)						

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

SITE INFORMATION	
User Name and Date	K.T. 05/01/2012
Site Name	SWMU 6, Vieques
Remedial Alternative Name	Sediment Excavation & Disposal
Alternative File Name (will be used in graphics and as file name; avoid invalid characters, e.g. ? : " / \ < > | * _)	Alt 3
Choose electricity region	FRCC

Do you want to reload a previously saved remedial alternative in the SiteWise input sheet?

Yes | Refresh List

Reset all input values on all worksheets to default

Reset All Values on All Sheets

-= Status =-

Done Loading!

Battelle
The Business of Innovation

U.S.ARMY

SiteWise™ Tool for Green and Sustainable Remediation has been developed jointly by United States (US) Navy, United States Army Corps of Engineers (USACE), and Battelle. This tool is made available on an as-is basis without guarantee or warranty of any kind, express or implied. The US Navy, USACE, Battelle, the authors, and the reviewers accept no liability resulting from the use of this tool or its documentation; nor does the above warrant or otherwise represent in any way the accuracy, adequacy, efficacy, or applicability of the contents hereof. Implementation of SiteWise™ tool and interpretation or use of the results provided by the tool are the sole responsibility of the user. The tool is provided free of charge for everyone to use, but is not supported in any way by the US Navy, USACE, or Battelle.

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

REMEDIAL ACTION CONSTRUCTION COST	Entire Site
Input total remedial action construction cost ($)	

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

Surveys (pre/post const. total 2 days
Construction (assuming 20 days) (4 contracotrs;1 oversight;

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Light truck	Light truck	Cars	Cars	Cars	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20	20				
Input number of trips taken	2	20				
Input number of travelers	1	3				
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						

*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000	3,000				
Input number of travelers	2	5				
Input number of flights taken	1	1				

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.						
Input weight of equipment transported per truck load (tons)						

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)						
Input weight of load (tons)						

EQUIPMENT USE

Sediment

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)		1,156				

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	1404	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area (ft2)						
Input time available (work days)						

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	40.0	1000.0				

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

Sediment (1733 tons)

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)	20					
Choose fuel used from drop down menu	Diesel	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips	87					
Input number of miles per trip	25					

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)	1730000					

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

SITE INFORMATION	
User Name and Date	K.T. 05/01/2012
Site Name	SWMU 6, Vieques
Remedial Alternative Name	In-situ Sand Capping
Alternative File Name (will be used in graphics and as file name; avoid invalid characters, e.g. ? : " / \ < > | * _)	Alt 4
Choose electricity region	FRCC

Do you want to reload a previously saved remedial alternative in the SiteWise input sheet?

RA_Alt 4_NoFR_1 C:\Documents a ▼ Yes Refresh List

Reset all input values on all worksheets to default

Reset All Values on All Sheets

-= Status =-

Done Loading!

Battelle
The Business of Innovation

SiteWise™ Tool for Green and Sustainable Remediation has been developed jointly by United States (US) Navy, United States Army Corps of Engineers (USACE), and Battelle. This tool is made available on an as-is basis without guarantee or warranty of any kind, express or implied. The US Navy, USACE, Battelle, the authors, and the reviewers accept no liability resulting from the use of this tool or its documentation; nor does the above warrant or otherwise represent in any way the accuracy, adequacy, efficacy, or applicability of the contents hereof. Implementation of SiteWise™ tool and interpretation or use of the results provided by the tool are the sole responsibility of the user. The tool is provided free of charge for everyone to use, but is not supported in any way by the US Navy, USACE, or Battelle.

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

REMEDIAL ACTION CONSTRUCTION COST	Entire Site
Input total remedial action construction cost ($)	

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

LUC/Deed Survey (1 da; Fence Installation (2 day; Revegetation (1 day) Sand Covering Construction Oversight (7 days)
same mobilization as fer 4 pesons; 7 days 1 person

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Light truck	Light truck	Light truck	Light truck	Light truck	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20	20	20	20	20	
Input number of trips taken	1	2	1	7	7	
Input number of travelers	1	1	1	2	1	
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						
*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.						

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000	3,000		3,000	3,000	
Input number of travelers	2	2		4	1	
Input number of flights taken	1	1		1	1	

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.		100				
Input weight of equipment transported per truck load (tons)		0.53				
		fence and post (5 lb/ft); 210 LF				

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)		50				
Input weight of load (tons)		0.53				

EQUIPMENT USE

Sand

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)				1,200		

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	0	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Diesel	Gasoline	Gasoline
Input area (ft2)				15,600		
Input time available (work days)				3		

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	20.0	40.0	20.0	280.0	70.0	

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Diesel	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)						

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

LONGTERM MONITORING COST AND DURATION	Entire Site
Input total longterm monitoring cost ($)	
Input duration of longterm monitoring (unit time)	1.0

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

5-year review 6 event
Annual sediment LTM 10 events

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Cars	Cars	Cars	Cars	Cars	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20	20				
Input number of trips taken	6	10				
Input number of travelers	2	1				
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						

*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000	3,000				
Input number of travelers	2	2				
Input number of flights taken	6	10				

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.						
Input weight of equipment transported per truck load (tons)						

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)						
Input weight of load (tons)						

EQUIPMENT USE

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)						

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	0	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area (ft2)						
Input time available (work days)						

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	40	200.0				

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)						

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

SITE INFORMATION	
User Name and Date	K.T. 05/28/2012
Site Name	SWMU 6, Vieques
Remedial Alternative Name	In-situ Reactive Capping
Alternative File Name (will be used in graphics and as file name; avoid invalid characters, e.g. ? : " / \ < > | * _)	Alt 5
Choose electricity region	FRCC

Do you want to reload a previously saved remedial alternative in the SiteWise input sheet?

RA_Alt 5_NoFR_1 C:\Documents a ▼ Yes Refresh List

Reset all input values on all worksheets to default

Reset All Values on All Sheets

-= Status =-

Done Loading!

Battelle
The Business of Innovation

U.S.ARMY

SiteWise™ Tool for Green and Sustainable Remediation has been developed jointly by United States (US) Navy, United States Army Corps of Engineers (USACE), and Battelle. This tool is made available on an as-is basis without guarantee or warranty of any kind, express or implied. The US Navy, USACE, Battelle, the authors, and the reviewers accept no liability resulting from the use of this tool or its documentation; nor does the above warrant or otherwise represent in any way the accuracy, adequacy, efficacy, or applicability of the contents hereof. Implementation of SiteWise™ tool and interpretation or use of the results provided by the tool are the sole responsibility of the user. The tool is provided free of charge for everyone to use, but is not supported in any way by the US Navy, USACE, or Battelle.

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

REMEDIAL ACTION CONSTRUCTION COST	Entire Site
Input total remedial action construction cost ($)	

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

LUC/Deed Survey (1 da; Fence Installation (2 day; Revegetation (1 day) RCM/Sand Covering Construction Oversight (3 days)
same mobilization as fer 4 pesons; 3 days 1 person

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Light truck	Light truck	Light truck	Light truck	Light truck	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20	20	20	20	20	
Input number of trips taken	1	2	1	3	3	
Input number of travelers	1	1	1	2	1	
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						

*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000	3,000		3,000	3,000	
Input number of travelers	2	2		4	1	
Input number of flights taken	1	1		1	1	

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.		100				
Input weight of equipment transported per truck load (tons)		0.53				

fence and post (5 lb/ft); 210 LF

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)		50				
Input weight of load (tons)		0.53				

EQUIPMENT USE

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)				300		

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	0	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Diesel	Gasoline	Gasoline
Input area (ft2)				15,600		
Input time available (work days)				3		

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	20.0	40.0	20.0	120.0	30.0	

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Diesel	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)						

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

LONGTERM MONITORING COST AND DURATION	Entire Site
Input total longterm monitoring cost ($)	
Input duration of longterm monitoring (unit time)	1.0

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

5-year review: 6 events
Annual sediment LTM: 10 events

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Cars	Cars	Cars	Cars	Cars	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20	20				
Input number of trips taken	6	10				
Input number of travelers	2	1				
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						

*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000	3,000				
Input number of travelers	2	2				
Input number of flights taken	6	10				

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.						
Input weight of equipment transported per truck load (tons)						

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)						
Input weight of load (tons)						

EQUIPMENT USE

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)						

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	0	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area (ft2)						
Input time available (work days)						

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	40	200.0				

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)						

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

SITE INFORMATION	
User Name and Date	K.T. 05/28/2012
Site Name	SWMU 6, Vieques
Remedial Alternative Name	Soil Covering
Alternative File Name (will be used in graphics and as file name; avoid invalid characters, e.g. ? : " / \ < > | * _)	Alt 6
Choose electricity region	FRCC

Do you want to reload a previously saved remedial alternative in the SiteWise input sheet?

RA_Alt 6_NoFR_1 C:\Documents a ▼ Yes Refresh List

Reset all input values on all worksheets to default

Reset All Values on All Sheets

-= Status =-

Done Loading!

Battelle
The Business of Innovation

SiteWise™ Tool for Green and Sustainable Remediation has been developed jointly by United States (US) Navy, United States Army Corps of Engineers (USACE), and Battelle. This tool is made available on an as-is basis without guarantee or warranty of any kind, express or implied. The US Navy, USACE, Battelle, the authors, and the reviewers accept no liability resulting from the use of this tool or its documentation; nor does the above warrant or otherwise represent in any way the accuracy, adequacy, efficacy, or applicability of the contents hereof. Implementation of SiteWise™ tool and interpretation or use of the results provided by the tool are the sole responsibility of the user. The tool is provided free of charge for everyone to use, but is not supported in any way by the US Navy, USACE, or Battelle.

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

REMEDIAL ACTION CONSTRUCTION COST	Entire Site
Input total remedial action construction cost ($)	

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

Surveys (pre/post const. total 2 days — Soil Covering&Revegetation (assuming 10 days) (4 contracotrs;1 oversight;

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Light truck	Light truck	Cars	Cars	Cars	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20	20				
Input number of trips taken	2	10				
Input number of travelers	1	3				
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						

*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000	3,000				
Input number of travelers	2	5				
Input number of flights taken	1	1				

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.						
Input weight of equipment transported per truck load (tons)						

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)						
Input weight of load (tons)						

EQUIPMENT USE

Borrow soil

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)		3,800				

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	1404	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area (ft2)		24,000				
Input time available (work days)		10				

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	entific and technical serv	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)	40.0	500.0				

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Diesel	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)	1320000					

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

This worksheet allows the user to define material production, transportation, equipment use, and residual handling variables for the remedial alternative
Yellow cells require the user to choose an input from a drop down menu
White cells require the user to type in a value

BASELINE INFORMATION

LONGTERM MONITORING COST AND DURATION	Entire Site
Input total longterm monitoring cost ($)	
Input duration of longterm monitoring (unit time)	1.0

MATERIAL PRODUCTION

WELL MATERIALS	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Choose specific material schedule from drop down menu	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Choose well diameter (in) from drop down menu	1/8	1/8	1/8	1/8	1/8	1/8

TREATMENT CHEMICALS & MATERIALS	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input number of injection points						
Choose material type from drop down menu	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide	Hydrogen Peroxide
Input amount of material injected at each point (pounds dry mass)						
Input number of injections per injection point						

TREATMENT MEDIA	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
Input weight of media used (lbs)						
Choose media type from drop down menu	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC	Virgin GAC

CONSTRUCTION MATERIALS	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material type from drop down menu	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner	HDPE Liner
Input area of material (ft2)						
Input depth of material (ft)						

WELL DECOMMISSIONING	Well Type 1	Well Type 2	Well Type 3	Well Type 4	Well Type 5	Well Type 6
Input number of wells						
Input depth of wells (ft)						
Input well diameter (in)						
Choose material from drop down menu	Soil	Soil	Soil	Soil	Soil	Soil

BULK MATERIAL QUANTITIES	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
Choose material from drop down menu	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid	Acetic Acid
Choose units of material quantity from drop down menu	pounds	pounds	pounds	pounds	pounds	pounds
Input material quantity						

TRANSPORTATION

5-y-review
6 events

PERSONNEL TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose vehicle type from drop down menu*	Cars	Cars	Cars	Cars	Cars	Cars
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input distance traveled per trip (miles)	20					
Input number of trips taken	6					
Input number of travelers	2					
Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)						

*For vehicle type 'Other' please enter values in Table 2b in the Look Up Table tab.

PERSONNEL TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)	3,000					
Input number of travelers	2					
Input number of flights taken	6					

PERSONNEL TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Choose vehicle type from drop down menu	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail	Intercity rail
Input distance traveled (miles)						
Input number of trips taken						
Input number of travelers						

EQUIPMENT TRANSPORTATION - ROAD	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total distance traveled (miles) with a given load. Add return trip(s) with no load in a separate column if applicable.						
Input weight of equipment transported per truck load (tons)						

EQUIPMENT TRANSPORTATION - AIR	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of equipment transported (tons)						

EQUIPMENT TRANSPORTATION - RAIL	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (miles)						
Input weight of load (tons)						

EQUIPMENT TRANSPORTATION - WATER	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6
Input distance traveled (mile)						
Input weight of load (tons)						

EQUIPMENT USE

EARTHWORK	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose earthwork equipment type from drop down menu	Dozer	Dozer	Dozer	Dozer	Dozer	Dozer
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input volume of material to be removed (yd3)						

Will DIESEL-run equipment be retrofitted with a particulate reduction technology?	No	No	No	No	No	No

DRILLING	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Input number of drilling locations						
Choose drilling method from drop down menu	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Input time spent drilling at each location (hr)						
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

TRENCHING	Trencher 1	Trencher 2	Trencher 3	Trencher 4	Trencher 5	Trencher 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input operating hours (hr)						

For each pump, select only one of the three methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused pump columns or unused methods

PUMP OPERATION	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - ELECTRICAL USAGE IS KNOWN						
Input pump electrical usage (KWh)	0	0	0	0	0	0
Method 2 - PUMP HEAD IS KNOWN						
Input flow rate (gpm)	0	0	0	0	0	0
Input total head (ft)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Pump efficiency times motor efficiency (default already present, user override possible)	0.51	0.51	0.51	0.51	0.51	0.51
Input specific gravity (default already present, user override possible)	1	1	1	1	1	1
Method 3 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input pump horsepower (hp)	0	0	0	0	0	0
Input number of pumps operating	0	0	0	0	0	0
Input operating time for each pump (hrs)	0	0	0	0	0	0
Input pump load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input pump motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

DIESEL AND GASOLINE PUMPS	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1	2-Stroke: 0 to 1
Equipment operating hours (hrs)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the pump selected, otherwise a default will be used by the tool)						

For each type of equipment, select only one of the methods to calculate energy and GHG emissions
Enter "0" for all user input values for unused equipment columns or unused methods

BLOWER, COMPRESSOR, MIXER, AND OTHER EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose type of equipment from drop down	Blower	Blower	Blower	Blower	Blower	Blower
Choose method from drop down	Method 1	Method 1	Method 1	Method 1	Method 1	Method 1
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN						
Input equipment horsepower (hp)	0	0	0	0	0	0
Input number of equipments operating	0	0	0	0	0	0
Input operating time for each equipment (hrs)	0	0	0	0	0	0
Input equipment load (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Input motor efficiency (default already present, user override possible)	0.85	0.85	0.85	0.85	0.85	0.85
Method 2 - ELECTRICAL USAGE IS KNOWN						
Input equipment electrical usage, if known (kWh)	0	0	0	0	0	0
Region						
Electricity Region	FRCC	FRCC	FRCC	FRCC	FRCC	FRCC

GENERATORS	Generator 1	Generator 2	Generator 3	Generator 4	Generator 5	Generator 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
Input operating hours (hr)						

AGRICULTURAL EQUIPMENT	Tillage Tractor 1	Tillage Tractor 2	Tillage Tractor 3	Tillage Tractor 4	Tillage Tractor 5	Tillage Tractor 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area to till (acre)						
Choose soil condition from drop down menu	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil	Firm untilled soil
Choose soil type from drop down menu	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil	Clay Soil
Input time available (work days)						
Input depth of tillage (in)						

CAPPING EQUIPMENT	Equipment 1	Equipment 2	Equipment 3	Equipment 4	Equipment 5	Equipment 6
Choose stabilization equipment type from drop down menu	Roller	Roller	Roller	Roller	Roller	Roller
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input area (ft2)						
Input time available (work days)						

MIXING EQUIPMENT	Mixer 1	Mixer 2	Mixer 3	Mixer 4	Mixer 5	Mixer 6
Choose fuel type from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Choose horsepower range from drop down menu	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
Input volume (yd3)						
Input production rate (yd3/hr)						
Input estimated fuel consumption rate (gal/hr) (Input only if known for the mixer selected, otherwise a default will be used by the tool)						

INTERNAL COMBUSTION ENGINES	Engine 1	Engine 2	Engine 3	Engine 4	Engine 5	Engine 6
Choose fuel type from drop down menu	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Input fuel consumption rate (gal/hr or scf/hr)						
Input operating hours (hr)						

OTHER FUELED EQUIPMENT	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas

Input volume (scf for Natural gas, gallons for all others)						

OPERATOR LABOR	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Occupation 5	Occupation 6
Choose occupation from drop-down menu	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers	Construction laborers
Input total time worked onsite (hours)						

LABORATORY ANALYSIS	Analysis 1	Analysis 2	Analysis 3	Analysis 4	Analysis 5	Analysis 6
Input dollars spent on laboratory analysis ($)						

OTHER KNOWN ONSITE ACTIVITIES	Entire Site
Input energy usage (MMBTU)	
Water consumption (gallon)	
Input CO2 emission (metric ton)	
Input N2O emission (metric ton CO2 e)	
Input CH4 emission (metric ton CO2 e)	
Input NOx emission (metric ton)	
Input SOx emission (metric ton)	
Input PM10 emission (metric ton)	
Input fatality risk	
Input injury risk	

RESIDUAL HANDLING

RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water	Material Residue	Other Residuals	Other Residuals	Other Residuals
Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No	No	No	No	No
Input weight of the waste transported to landfill or recycling per trip (tons)						
Choose fuel used from drop down menu	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Input total number of trips						
Input number of miles per trip						

LANDFILL OPERATIONS	Operation 1	Operation 2	Operation 3	Operation 4	Operation 5	Operation 6
Choose landfill type for waste disposal	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous
Input amount of waste disposed in landfill (tons)						
Input landfill methane emissions (metric tons CH4)						

THERMAL/CATALYTIC OXIDIZERS*	Oxidizer 1	Oxidizer 2	Oxidizer 3	Oxidizer 4	Oxidizer 5	Oxidizer 6
Choose oxidizer type from drop down menu	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer	Simple Thermal Oxidizer
Choose fuel type from drop down menu	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Input waste gas flow rate (scfm)						
Input time running (hours)						
Input waste gas inlet temperature (F)						
Input contaminant concentration (ppmV)						

*(Electric blowers are included in the analysis)

RESOURCE CONSUMPTION

WATER CONSUMPTION	Treatment System 1	Treatment System 2	Treatment System 3	Treatment System 4	Treatment System 5	Treatment System 6
Input total water consumed from potable water treatment facility (gal)						
Input total water disposed to wastewater treatment facility (gal)						

ONSITE LAND AND WATER RESOURCE CONSUMPTION	Entire Site 1	Entire Site 2	Entire Site 3	Entire Site 4	Entire Site 5	Entire Site 6
Input volume of topsoil brought to site (cubic yards)						
Input volume of groundwater or surface water lost (gal)						

Appendix I
West Vieques Sediment Pesticide Detection Table

Vieques West
All Sites
Sediment Data Detected Analytical Results
November 2011

Station ID	W.Vieques non	W.Vieques non	2011	2011	VWW06-SD001	VWW06-SD002	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006	
Sample ID	SWMU 6 sites	SWMU 6 sites	SWMU 6	SWMU 6	VWW06-SD001-0211	VWW06-SD002-0211	VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211
Sample Date	Min	Max	Min	Max	02/08/11	02/08/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11
Chemical Name											
Pesticides (UG/KG)											
4,4'-DDD	0.23	5.8	1.4	59	2.6 UJ	1.5 J	59 J	14 J	4.6 J	2.7 UJ	2.8 J
4,4'-DDE	0.07	12	1.1	94	1.4 UJ	1.1 J	94 J	28 J	9.7 J	2.9 J	5.9 J
4,4'-DDT	0.45	41	3.2	7	2 UJ	1.5 UJ	3.2 J	2.3 U	2 UJ	2 UJ	2.1 UJ
Aldrin	0.58	0.58	ND	ND	0.77 UJ	0.58 UJ	0.92 UJ	0.9 U	0.77 UJ	0.8 UJ	0.84 UJ
alpha-BHC	2.7	2.7	ND	ND	3.8 UJ	2.9 UJ	4.6 U	4.5 U	3.9 UJ	4 UJ	4.2 UJ
Dieldrin	0.54	4.4	ND	ND	0.82 UJ	0.62 UJ	0.98 U	0.96 U	0.82 UJ	0.85 UJ	0.89 UJ
Endosulfan I	0.93	0.93	ND	ND	1.1 UJ	0.85 UJ	1.4 U	1.3 U	1.1 UJ	1.2 UJ	1.2 UJ
Endosulfan sulfate	1.7	4.4	ND	ND	1 UJ	0.77 UJ	1.2 U	1.2 U	1 UJ	1.1 UJ	1.1 UJ
Endrin aldehyde	1.1	17	ND	ND	1.8 UJ	1.4 UJ	2.2 U	2.1 U	1.8 UJ	1.9 UJ	2 UJ
Endrin ketone	0.98	4.2	ND	ND	1.1 UJ	0.81 UJ	1.3 U	1.2 U	1.1 UJ	1.1 UJ	1.2 UJ
Heptachlor epoxide	0.65	1.6	ND	ND	0.77 UJ	0.58 UJ	0.92 UJ	0.9 U	0.77 UJ	0.8 UJ	0.84 UJ

P:\USNAVFACENGCOM\433193CTO0013\SWMU_6_FS_Draft\Appendix_I_West Vieques Sediment Pesticide Detection Table\[vw_sd_pest.xls], Victoria Brynildsen, 11/08/2011

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UG/KG - Micrograms per kilogram

Yellow shading columns include the 2011 SWMU 6 sediment data.

Vieques West
All Sites
Sediment Data Detected Analytical Results
November 2011

Station ID	VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010	VWW06-SD011		VWW06-SD014	VWW06-SD015	VWW06-SD016	VWW06-SD017
Sample ID	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211	VWW06-SD011-0211	VWW06-SD011P-0211	VWW06-SD014-0211	VWW06-SD015-0211	VWW06-SD016-0211	VWW06-SD017-0211
Sample Date	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/07/11	02/07/11	02/07/11	02/07/11
Chemical Name										
Pesticides (UG/KG)										
4,4'-DDD	3.2 UJ	1 UJ	34 J	5.4 J	1.4 J	1.7 J	3.4 UJ	2.2 UJ	3.1 UJ	3.8 UJ
4,4'-DDE	1.7 UJ	0.54 UJ	66 J	7.5 J	14 J	16 J	1.3 J	1.1 UJ	1.6 UJ	2 UJ
4,4'-DDT	2.4 UJ	0.76 UJ	3.7 UJ	2 UJ	7 J	5.9 J	2.6 UJ	1.6 UJ	2.3 UJ	2.8 UJ
Aldrin	0.93 UJ	0.3 UJ	1.5 UJ	0.77 UJ	0.26 UJ	0.26 UJ	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ
alpha-BHC	4.7 UJ	1.5 UJ	7.4 UJ	3.9 UJ	1.3 UJ	1.3 UJ	5 UJ	3.2 UJ	4.6 UJ	5.5 UJ
Dieldrin	0.99 UJ	0.32 UJ	1.6 UJ	0.82 UJ	0.27 UJ	0.28 UJ	1.1 UJ	0.68 UJ	0.98 UJ	1.2 UJ
Endosulfan I	1.4 UJ	0.44 UJ	2.2 UJ	1.1 UJ	0.37 UJ	0.38 UJ	1.5 UJ	0.93 UJ	1.3 UJ	1.6 UJ
Endosulfan sulfate	1.2 UJ	0.4 UJ	2 UJ	1 UJ	0.34 UJ	0.35 UJ	1.3 UJ	0.85 UJ	1.2 UJ	1.5 UJ
Endrin aldehyde	2.2 UJ	0.72 UJ	3.5 UJ	1.8 UJ	0.61 UJ	0.62 UJ	2.4 UJ	1.5 UJ	2.2 UJ	2.7 UJ
Endrin ketone	1.3 UJ	0.42 UJ	2.1 UJ	1.1 UJ	0.36 UJ	0.36 UJ	1.4 UJ	0.89 UJ	1.3 UJ	1.6 UJ
Heptachlor epoxide	0.93 UJ	0.3 UJ	1.5 UJ	0.77 UJ	0.26 UJ	0.26 UJ	1 UJ	0.64 UJ	0.92 UJ	1.1 UJ

P:\USNAVFACENGCOM\433193CTO0013\SWMU_6_FS_Draft\Appendix_

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UG/KG - Micrograms per kilogram

Yellow shading columns include the 2011 SWMU 6 sediment data.

Vieques West
All Sites
Sediment Data Detected Analytical Results
November 2011

								AOC C		AOC J		
Station ID	VWW06-SD018	VWW06-SD019	VWW06-SD020	VWW06-SD021	VWW06-SD022	VWW06-SD023		AC-SD01	AC-SD02	AOCJSD001	AOCJSD002	AOCJSD003
Sample ID	VWW06-SD018-0211	VWW06-SD019-0211	VWW06-SD020-0211	VWW06-SD021-0211	VWW06-SD022-0211	VWW06-SD023-0211	VWW06-SD023P-0211	NDA054	NDA055	NDE114	NDE115	NDE116
Sample Date	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	02/08/11	04/07/00	04/07/00	12/12/00	12/13/00	12/13/00
Chemical Name												
Pesticides (UG/KG)												
4,4'-DDD	3.9 UJ	3.9 UJ	4.1 UJ	4.2 UJ	4.5 UJ	3.6 UJ	3.5 UJ	3.4 UJ	3.3 UJ	4.5 U	4.9 UJ	6.4 UJ
4,4'-DDE	2.1 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.4 UJ	1.9 UJ	1.8 UJ	0.8 J	3.3 UJ	4.5 U	4.9 UJ	6.4 UJ
4,4'-DDT	2.9 UJ	2.9 UJ	3 UJ	3.1 UJ	3.4 UJ	2.6 UJ	2.6 UJ	3.4 UJ	3.3 UJ	4.5 U	4.9 UJ	6.4 UJ
Aldrin	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1 UJ	1 UJ	1.7 UJ	1.7 UJ	2.3 U	2.5 UJ	3.3 UJ
alpha-BHC	5.8 UJ	5.8 UJ	6 UJ	6.2 UJ	6.6 UJ	5.2 UJ	5.1 UJ	1.7 UJ	1.7 UJ	2.3 UJ	2.5 UJ	3.3 UJ
Dieldrin	1.2 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.4 UJ	1.1 UJ	1.1 UJ	4.4 J	3.3 UJ	4.5 U	4.9 UJ	6.4 UJ
Endosulfan I	1.7 UJ	1.7 UJ	1.8 UJ	1.8 UJ	2 UJ	1.5 UJ	1.5 UJ	1.7 UJ	1.7 UJ	2.3 U	2.5 UJ	3.3 UJ
Endosulfan sulfate	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.4 UJ	1.4 UJ	3.4 UJ	3.3 UJ	4.5 U	4.9 UJ	6.4 UJ
Endrin aldehyde	2.8 UJ	2.8 UJ	2.9 UJ	3 UJ	3.2 UJ	2.5 UJ	2.4 UJ	3.4 UJ	3.3 UJ	4.5 U	4.9 UJ	6.4 UJ
Endrin ketone	1.6 UJ	1.6 UJ	1.7 UJ	1.7 UJ	1.9 UJ	1.5 UJ	1.4 UJ	3.4 UJ	3.3 UJ	4.5 U	4.9 UJ	6.4 UJ
Heptachlor epoxide	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.3 UJ	1 UJ	1 UJ	1.7 UJ	1.7 UJ	2.3 U	2.5 UJ	3.3 UJ

P:\USNAVFACENGCOM\433193CTO0013\SWMU_6_FS_Draft\Appendix_

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UG/KG - Micrograms per kilogram

Yellow shading columns include the 2011 SWMU 6 sediment data.

Vieques West
All Sites
Sediment Data Detected Analytical Results
November 2011

	AOC H									AOC J						
Station ID	AOCJSD004	AOCJSD005		NDAHSD01		NDAHSD02	NDAHSD03	NDAHSD04	NDAHSD05	NDAJSD01	NDAJSD03	NDAJSD05		NDAJSD06	NDAJSD07
Sample ID	NDE117	NDE118	NDE119FD1	NDAHFD03P-R01	NDAHSD01-R01	NDAHSD02-R01	NDAHSD03-R01	NDAHSD04-R01	NDAHSD05-R01	NDAJSD01-R01	NDAJSD03-R01	NDAJFD03P-R01	NDAJSD05-R01	NDAJSD06-R01	NDAJSD07-R01
Sample Date	12/13/00	12/13/00	12/13/00	09/29/03	09/29/03	09/29/03	09/29/03	09/29/03	09/30/03	09/29/03	09/29/03	09/29/03	09/29/03	09/29/03	09/29/03
Chemical Name															
Pesticides (UG/KG)															
4,4'-DDD	8.6 UJ	4.6 UJ	4.6 UJ	4.4 R	4.3 U	4.3 U	4.5 U	4.5 U	3.4 U	4.2 UJ	0.78 J	5.8 J	0.34 J	4.2 UJ	4.5 UJ
4,4'-DDE	8.6 UJ	4.6 UJ	4.6 UJ	4.4 R	4.3 U	4.3 U	4.5 U	0.12 J	0.07 J	4.2 UJ	4.9 UJ	0.21 J	1 J	4.2 UJ	4.5 UJ
4,4'-DDT	8.6 UJ	4.6 UJ	4.6 UJ	4.4 R	4.3 U	4.3 U	4.5 U	4.5 U	3.4 U	4.2 UJ	4.3 J	41 J	0.6 J	4.2 UJ	4.5 UJ
Aldrin	4.5 UJ	2.4 UJ	2.4 UJ	2.2 R	2.2 U	2.2 U	2.3 U	2.3 U	1.8 U	2.2 UJ	2.5 UJ	1.8 U	2.3 UJ	2.2 UJ	2.3 UJ
alpha-BHC	4.5 UJ	2.4 UJ	2.4 UJ	2.2 R	2.2 UJ	2.2 UJ	2.3 UJ	2.3 UJ	1.8 UJ	2.2 UJ	2.5 UJ	1.8 UJ	2.3 UJ	2.2 UJ	2.3 UJ
Dieldrin	8.6 UJ	4.6 UJ	4.6 UJ	4.4 R	4.3 U	4.3 U	4.5 U	4.5 U	3.4 U	4.2 UJ	4.9 UJ	3.5 U	4.5 UJ	4.2 UJ	4.5 UJ
Endosulfan I	4.5 UJ	2.4 UJ	2.4 UJ	2.2 R	2.2 U	2.2 U	2.3 U	2.3 U	1.8 U	2.2 UJ	2.5 UJ	1.8 U	2.3 UJ	2.2 UJ	2.3 UJ
Endosulfan sulfate	8.6 UJ	4.6 UJ	4.6 UJ	4.4 R	4.3 U	4.3 U	4.5 U	4.5 U	3.4 U	4.2 UJ	4.9 UJ	3.5 U	4.5 UJ	4.2 UJ	4.5 UJ
Endrin aldehyde	8.6 UJ	4.6 UJ	4.6 UJ	4.4 R	4.3 U	4.3 U	4.5 U	4.5 U	3.4 U	4.2 UJ	4.9 UJ	3.5 U	4.5 UJ	4.2 UJ	4.5 UJ
Endrin ketone	8.6 UJ	4.6 UJ	4.6 UJ	4.4 R	4.3 U	4.3 U	4.5 U	4.5 U	3.4 U	4.2 UJ	4.9 UJ	3.5 U	4.5 UJ	4.2 UJ	4.5 UJ
Heptachlor epoxide	4.5 UJ	2.4 UJ	2.4 UJ	2.2 R	2.2 U	2.2 U	2.3 U	2.3 U	1.8 U	2.2 UJ	2.5 UJ	1.8 U	2.3 UJ	2.2 UJ	2.3 UJ

P:\USNAVFACENGCOM\433193CTO0013\SWMU_6_FS_Draft\Appendix_

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UG/KG - Micrograms per kilogram

Yellow shading columns include the 2011 SWMU 6 sediment data.

Vieques West
All Sites
Sediment Data Detected Analytical Results
November 2011

	SWMU 14	SWMU 6											SWMU 7				AOC R		
Station ID	NDAJSD08	W14-SD01		W14-SD02	W14-SD03	W6-SD01	W6-SD02	W6-SD03		W6-SD04	W6-SD05	W6-SD06	W6-SD07	W7-SD01	W7-SD02	W7-SD03	WAR-SDSW01		WAR-SDSW02
Sample ID	NDAJSD08-R01	NDA050	NDA051FD1	NDA052	NDA053	NDA042	NDA043	NDA044	NDA307FD1	NDA045	NDA046	NDA302	NDA303	NDA047	NDA048	NDA049	WAR-SD01	WAR-SD01P	WAR-SD02
Sample Date	09/29/03	04/06/00	04/06/00	04/06/00	04/06/00	04/13/00	04/13/00	04/13/00	04/13/00	04/13/00	04/13/00	04/13/00	04/13/00	04/18/00	04/18/00	04/18/00	12/06/05	12/06/05	12/05/05
Chemical Name																			
Pesticides (UG/KG)																			
4,4'-DDD	0.23 J	38 UJ	41 UJ	41 UJ	25 UJ	5.5 U	4.9 U	16 UJ	16 UJ	12 UJ	13 UJ	8.3 UJ	15 UJ	3.6 UJ	3.8 UJ	3.6 UJ	4.1 U	4.2 U	4.1 U
4,4'-DDE	0.21 J	12 J	4.2 UJ	41 UJ	6.2 J	5.5 U	0.81 J	16 UJ	16 UJ	12 UJ	13 UJ	8.3 UJ	15 UJ	3.6 UJ	3.8 UJ	3.6 UJ	4.1 U	4.2 U	4.1 U
4,4'-DDT	0.45 J	13 J	41 UJ	41 UJ	25 UJ	5.5 U	4.9 U	16 UJ	16 UJ	12 UJ	13 UJ	8.3 UJ	15 UJ	3.6 UJ	3.8 UJ	3.6 UJ	4.1 U	4.2 U	4.1 U
Aldrin	2.2 UJ	20 UJ	21 UJ	21 UJ	13 UJ	2.8 U	2.5 U	8 UJ	8 UJ	6 UJ	6.8 UJ	4.3 UJ	7.5 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.1 U	2.2 U	2.1 U
alpha-BHC	2.2 UJ	20 UJ	21 UJ	21 UJ	13 UJ	2.8 U	2.5 U	8 UJ	8 UJ	6 UJ	6.8 UJ	4.3 UJ	7.5 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.1 U	2.2 U	2.1 U
Dieldrin	4.4 UJ	38 UJ	41 UJ	41 UJ	25 UJ	5.5 U	4.9 U	16 UJ	16 UJ	12 UJ	13 UJ	8.3 UJ	15 UJ	3.6 UJ	3.8 UJ	3.6 UJ	4.1 U	4.2 U	4.1 U
Endosulfan I	2.2 UJ	20 UJ	21 UJ	21 UJ	13 UJ	2.8 U	2.5 U	8 UJ	8 UJ	6 UJ	6.8 UJ	4.3 UJ	7.5 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.1 U	2.2 U	2.1 U
Endosulfan sulfate	4.4 UJ	38 UJ	41 UJ	41 UJ	25 UJ	5.5 U	4.9 U	16 UJ	16 UJ	12 UJ	13 UJ	8.3 UJ	15 UJ	3.6 UJ	3.8 UJ	3.6 UJ	4.1 U	4.2 U	4.1 U
Endrin aldehyde	4.4 UJ	38 UJ	41 UJ	41 UJ	25 UJ	5.5 U	4.9 U	16 UJ	16 UJ	12 UJ	13 UJ	8.3 UJ	15 UJ	3.6 UJ	3.8 UJ	3.6 UJ	4.1 U	4.2 U	4.1 U
Endrin ketone	4.4 UJ	38 UJ	41 UJ	41 UJ	25 UJ	5.5 U	4.9 U	16 UJ	16 UJ	12 UJ	13 UJ	8.3 UJ	15 UJ	3.6 UJ	3.8 UJ	3.6 UJ	4.1 U	4.2 U	4.1 U
Heptachlor epoxide	2.2 UJ	20 UJ	21 UJ	21 UJ	13 UJ	2.8 U	2.5 U	8 UJ	8 UJ	6 UJ	6.8 UJ	4.3 UJ	7.5 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.1 U	2.2 U	2.1 U

P:\USNAVFACENGCOM\433193CTO0013\SWMU_6_FS_Draft\Appendix_

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UG/KG - Micrograms per kilogram

Yellow shading columns include the 2011 SWMU 6 sediment data.

Vieques West
All Sites
Sediment Data Detected Analytical Results
November 2011

SWMU 4

Station ID	WAR-SDSW03	WW04-SDSW01			WW04-SDSW02		WW04-SDSW03	WW04-SDSW04		WW04-SDSW05	
Sample ID	WAR-SD03	WW04-SD01-A-07A	WW04-SD01-B-07A	WW04-SD01P-A-07A	WW04-SD02-A-07A	WW04-SD02-B-07A	WW04-SD03-A-07A	WW04-SD04-A-07A	WW04-SD04-B-07A	WW04-SD05-A-07A	WW04-SD05-B-07A
Sample Date	12/05/05	02/13/07	02/13/07	02/13/07	02/13/07	02/13/07	02/16/07	02/15/07	02/15/07	02/14/07	02/14/07
Chemical Name											
Pesticides (UG/KG)											
4,4'-DDD	4.1 U	14 UJ	7.8 U	14 UJ	12 U	11 U	28 UJ	21 UJ	16 UJ	7.4 U	6.4 U
4,4'-DDE	4.1 U	1.8 J	1.2 J	2 J	7.3 J	2.9 J	28 UJ	21 UJ	16 UJ	7.4 U	6.4 U
4,4'-DDT	2.3 J	14 UJ	7.8 U	14 UJ	12 UJ	0.67 J	28 UJ	21 U	16 UJ	7.4 U	6.4 U
Aldrin	2.1 U	7 UJ	4 U	7.2 UJ	6.1 UJ	0.58 J	15 UJ	11 UJ	8.3 UJ	3.8 U	3.3 U
alpha-BHC	2.1 U	7 UJ	4 U	7.2 UJ	6.1 UJ	5.8 UJ	15 UJ	11 UJ	8.3 UJ	3.8 U	3.3 U
Dieldrin	4.1 U	14 UJ	7.8 U	14 UJ	12 UJ	11 UJ	28 UJ	21 UJ	16 UJ	7.4 U	6.4 U
Endosulfan I	2.1 U	7 UJ	4 U	7.2 UJ	6.1 UJ	5.8 UJ	15 UJ	11 UJ	8.3 UJ	3.8 U	3.3 U
Endosulfan sulfate	4.1 U	14 R	7.8 R	14 R	12 R	11 U	28 UJ	21 UJ	16 UJ	7.4 U	6.4 U
Endrin aldehyde	4.1 U	14 U	7.8 U	1.1 J	12 U	11 U	28 UJ	21 U	1.8 J	7.4 U	6.4 U
Endrin ketone	4.1 U	14 UJ	7.8 U	14 UJ	12 UJ	11 UJ	28 UJ	21 U	16 UJ	7.4 U	6.4 U
Heptachlor epoxide	2.1 U	7 UJ	4 U	7.2 UJ	0.65 J	5.8 UJ	15 UJ	11 UJ	8.3 UJ	3.8 U	3.3 U

P:\USNAVFACENGCOM\433193CTO0013\SWMU_6_FS_Draft\Appendix_

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UG/KG - Micrograms per kilogram

Yellow shading columns include the 2011 SWMU 6 sediment data.

Vieques West
All Sites
Sediment Data Detected Analytical Results
November 2011

Station ID	WW04-SDSW06			WW04-SDSW07	WW04-SDSW08		WW04-SDSW09		WW04-SDSW10		WW04-SDSW43
Sample ID	WW04-SD06-A-07A	WW04-SD06-B-07A	WW04-SD06P-A-07A	WW04-SD07-A-07A	WW04-SD08-A-07A	WW04-SD08-B-07A	WW04-SD09-A-07A	WW04-SD09-B-07A	WW04-SD10-A-07A	WW04-SD10-B-07A	WW04-SD43-A-07A
Sample Date	02/15/07	02/15/07	02/15/07	02/16/07	02/15/07	02/15/07	02/14/07	02/14/07	02/14/07	02/14/07	01/30/07
Chemical Name											
Pesticides (UG/KG)											
4,4'-DDD	18 UJ	5.9 U	16 UJ	30 UJ	12 UJ	11 U	7.9 U	3.9 U	14 UJ	2.5 J	11 UJ
4,4'-DDE	18 UJ	1.3 J	16 UJ	30 UJ	12 U	11 U	7.9 U	3.9 U	14 U	13 UJ	11 UJ
4,4'-DDT	1.1 UJ	5.9 U	16 UJ	30 UJ	12 U	11 U	3.2 J	3.3 J	12 J	13 U	11 U
Aldrin	9.1 UJ	3 U	8.5 UJ	15 UJ	5.9 UJ	5.5 UJ	4.1 U	3.9 U	7 UJ	6.5 U	5.8 UJ
alpha-BHC	9.1 UJ	3 U	8.5 UJ	15 UJ	5.9 UJ	5.5 U	4.1 U	3.9 U	7 UJ	6.5 UJ	2.7 J
Dieldrin	18 UJ	5.9 U	16 UJ	30 UJ	1.5 J	0.65 J	0.54 J	0.64 J	14 UJ	13 UJ	1.3 J
Endosulfan I	9.1 UJ	3 U	8.5 UJ	15 UJ	5.9 UJ	0.93 J	4.1 U	3.9 U	7 UJ	6.5 UJ	5.8 U
Endosulfan sulfate	18 UJ	5.9 U	16 UJ	30 UJ	1.7 J	11 U	7.9 U	7.6 U	14 UJ	13 UJ	4.4 J
Endrin aldehyde	18 UJ	15	16 UJ	30 U	1.4 J	11 U	7.9 U	9.2 J	14 U	17 J	11 UJ
Endrin ketone	18 U	5.9 U	0.98 J	30 UJ	4.2 J	11 U	7.9 U	7.6 U	14 U	13 UJ	1.1 J
Heptachlor epoxide	9.1 UJ	3 U	8.5 UJ	15 UJ	5.9 U	5.5 U	4.1 U	3.9 U	1.6 J	6.5 U	0.81 J

P:\USNAVFACENGCOM\433193CTO0013\SWMU_6_FS_Draft\Appendix_

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UG/KG - Micrograms per kilogram

Yellow shading columns include the 2011 SWMU 6 sediment data.

Appendix J
Final Response to USEPA, PREQB and USFWS Comments

Final Response to EPA Comments on the Draft Feasibility Study for SWMU 6, Former Naval Support Detachment, Vieques, Puerto Rico, Dated June 2012

General Comments

1. The FS indicates that in the event that Alternatives 3, 4, and 5 (See Section 6, Development of Remedial Alternatives) include installation of a physical barrier to block the hydraulic connection between the SWMU 6 lagoon and the Laguna Kiani complex, remedial action objective (RAO) 2 and associated monitoring would be eliminated. It is unclear why elimination of RAO 2 and associated monitoring would be appropriate in the event that the referenced physical barrier is installed. RAO 2 consists of ensuring that the benthic community is not impaired such that it adversely affects upper trophic level populations that rely on it as a food source. It is assumed that installation of a hydraulic barrier would not prevent upper trophic level organisms from accessing SWMU 6. Revise the FS to explain why installation of a hydraulic barrier at SWMU 6 eliminates RAO 2 and associated monitoring.

Navy Response:

RAO 2 is not applicable to Alternatives 4 and 5 (see response to Specific Comment #2) because the existing benthic community is not maintained (i.e., a new community would develop on the cap). The text regarding RAO 2 (and potential installation of a hydraulic barrier) for these two alternatives in Sections 6.4 and 6.5 has been removed.

RAO 2 is applicable to Alternative 2 because the benthic community would have to be un-impaired in the presence of potentially contaminated sediment since no capping would take place. While installing the hydraulic barrier as part of this alternative would not prevent upper trophic level organisms from accessing SWMU 6, the hydraulic barrier would prevent tidal exchanges and may result in the relatively rapid drying of the shallowest portions of the lagoon or at least create stagnant conditions that would not likely support a diverse benthic (or fish) community upon which upper trophic level organisms would rely. In this case, ensuring a thriving benthic community would no longer be an objective because preventing recreationally consumable fish and crab (which may be contaminated) from passing freely between the site and the adjacent lagoon complex would be deemed more desirable than maintaining the ecology of the SWMU 6 lagoon.

The following has been added to the end of the third bullet under Section 6.2:

> "While installing the hydraulic barrier as part of this alternative would not prevent upper trophic level organisms from accessing SWMU 6, the hydraulic barrier would prevent tidal exchanges and may result in the relatively rapid drying of the shallowest portions of the lagoon or at least create stagnant conditions that would not likely support a diverse benthic (or fish) community upon which upper trophic level organisms would rely. In this case, ensuring a thriving benthic community would no longer be an objective because preventing recreationally consumable fish and crab (which may be contaminated) from passing freely between the site and the adjacent lagoon complex would be deemed more desirable than maintaining the ecology of the SWMU 6 lagoon."

EPA Evaluation of Response:

General Comments 1 and 2 have conflicting statements on whether RAO 2 is applied to Alternative 4 and 5.

Navy Evaluation Response:

Based on discussions held in the October 2012 Vieques Technical Subcommittee meeting, a generic RAO related to the benthic community has been developed that applies to all alternatives except the No Action Alternative (Alternative 1) and Soil Cover Alternative (Alternative 6). RAO 2 has been revised to read:

- "Encourage development of a benthic community that reflects the physical environment represented by the SWMU 6 habitat relative to surrounding marine habitats"

All text associated with RAO has been revised accordingly.

Please also note that, based on discussion at the aforementioned meeting, because Alternative 6 would restore SWMU 6 to the pre-removal estuarine, intertidal, forested wetland dominated by black mangrove conditions, the title of Alternative 6 has been revised to "Intertidal Forested Wetland Restoration and Land Use Controls."

2. Alternative 2 assumes that annual monitoring for contaminants in sediment will be necessary for five years, and Alternatives 4 and 5 assume that annual monitoring for contaminants in sediment will be necessary for 10 years (See Section 6, Development of Remedial Alternatives). It is unclear why these time-frames are assumed to be sufficient. Revise the FS to justify why the assumed monitoring time-frames will be sufficient in terms of each alternative's ability to meet the RAOs.

Navy Response:

As discussed in the August 2012 Technical Subcommittee meeting, the monitoring timeframes and protocol are just estimates (based on observations of the developing ecosystem at SWMU 6) used for relative cost estimating suitable for a feasibility study and that the actual monitoring duration and protocol will be based on data collected during long term monitoring.

The following has been inserted before the last sentence of the first paragraph of Section 6.2: "For SWMU 6, unacceptable, but relatively low human health and ecological risks were identified: for human health, the total detected PCB concentration in SWMU 6 sediment is 0.26 mg/kg, which is marginally higher than PRG of 0.2 mg/kg; for the benthic community, lead and zinc were marginally elevated above ecological screening values. Based on observations made of the post-removal, developing ecosystem at SWMU 6, it is anticipated that within an additional few years, RAOs would be met by the MNR processes described above. For FS cost estimating purposes, it is assumed that annual monitoring for contaminants in sediment will be necessary for 5 years to meet PRGs for Alternative 2. However, the actual monitoring duration and protocol will be based on observations made during long-term monitoring."

The following has been inserted at the end of the first paragraph of Section 6.3 (which has been corrected to be Section 6.4): "Alternative 4 involves sand capping. Although this alternative would likely achieve RAO 1 for protection of human exposure to PCBs in fish and crabs relatively quickly, due to the disturbance of the elecological community during the remedial construction, establishment of a benthic community would essentially be "restarted." Therefore, for FS cost estimating purposes, it is estimated that additional time (conservatively estimated to be 10 years) would be required to verify RAO 2 was met because it may not be possible to distinguish a developing benthic community from an impaired one (relative to background). However, the actual monitoring duration and protocol will be based on observations made during long-term monitoring."

The following has been inserted at the end of the first paragraph of Section 6.4 (which has been corrected to be Section 6.5): "Alternative 5 involves reactive capping. Although this alternative would likely achieve RAO 1 for protection of human exposure to PCBs in fish and crabs relatively quickly, due to the disturbance of the elecological community during the remedial construction, establishment of a benthic community would essentially be "restarted." Therefore, for FS cost estimating purposes, it is estimated that additional time (conservatively estimated to be 10 years) would be required to verify RAO 2 was met because it may not be possible to distinguish a developing benthic community from an impaired one

(relative to background). However, the actual monitoring duration and protocol will be based on observations made during long-term monitoring."

EPA Evaluation of Response:

General Comments 1 and 2 have conflicting statements on whether RAO 2 is applied to Alternative 4 and 5

Navy Evaluation Response:

Please see the response to EPA evaluation of the response to General Comment 1.

3. According to the FS, Alternative 3 involves the excavation of approximately two feet of sediment. It is unclear how it was determined that removal of two feet of sediment is appropriate, and if this estimate is based on sampling data. Further information should be provided to demonstrate that two feet of excavation is appropriate based on the sampling data, and that the remedial alternative was scoped and costed to reflect a - 30%/ +50% margin as allowed for during the FS process. Revise the FS to justify the proposed excavation depth.

Navy Response:

The second sentence of the first paragraph under Alternative 3 (now labeled as Section 6.3) has been revised to read: "The actual depth of sediment removal required to achieve the PRGs is unknown, which yields considerable cost uncertainty in this alternative because it could be considerably more than 2 feet. The uncertainty is associated with such factors as the depth of contaminant concentrations above PRGs and residual contaminant concentrations resulting from sediment suspension and re-deposition during excavation. However, the 2-foot estimate is based on the general depth of excavation during the interim removal action (Shaw, 2010) and is sufficient for FS cost estimating purposes. The exact depth of required excavation would be determined based on the post-excavation sediment sampling, which is included in the Alternative 3 Cost Estimate."

4. Alternative 4 includes a two foot sand cap; however, the rationale for the thickness of the sand cap is not provided in the FS. It is unclear how the thickness of the cap was determined and how it meets the RAOs. Further information should be provided as a rationale for the thickness of the cap. Revise the FS to provide this information.

Navy Response:

The following has been added to the end of the second bullet under Alternative 4 (now labeled as Section 6.4): "The rationale for a 2-foot-thick sand cap for Alternative 4 is based on the sediment sand cap thickness (2 to 3 feet) commonly used for sediment capping according to Contaminated Sediment Remediation Guidance document EPA-540-R-05-012 (USEPA, 2005). In addition, a 2-foot-thick sand cap is four times the thickness considered protective of the ecological receptor scenario (typically 6 inches). Further, installing more than 2 feet of sand would likely result in filling in the vast majority of the lagoon."

5. The FS indicates that Alternatives 3, 4, and 5 (See Section 6, Development of Remedial Alternatives) may include installation of physical barriers to block the hydraulic connection between the SWMU 6 lagoon and the Laguna Kiani complex. However, costs for this are not included in the estimates provided in Appendix G. As such, it is unclear whether the remedial alternatives were appropriately scoped and costed to reflect a -30%/ +50% margin as allowed for during the FS process. Revise the FS to clarify whether installation of a physical barrier is actually included in Alternatives 3, 4, and 5, and if so, revise the cost estimates in Appendix G accordingly.

Navy Response:

It appears that the commenter may have been questioning whether the costs for the hydraulic barrier are included in the costs for Alternatives 2, 4, and 5, rather than 3, 4, and 5, since the text under Alternatives 2, 4, and 5 indicates the physical barrier "could" be installed, not that it would be as is stated for Alternative 3 (see Alternative 3, now correctly labeled as Section 6.3, and Appendix G). For Alternatives 4 and 5, because no dewatering would be necessary and because capping would be used to isolate contamination in the sediment, no hydraulic barrier is needed and their cost estimates do not include installing one. As noted above, a physical barrier is not inherent to Alternative 2, only that a physical barrier could be included. For clarity, the following sentence has been added to the end of the third bullet under Section 6.2: "Because a hydraulic barrier is not an inherent part of Alternative 2, the associated cost is not included in the cost estimate. However, if a hydraulic barrier is deemed beneficial, the additional cost would be the same as that shown for the earthen berm in Alternatives 3 and 6 and the details of its construction included in the RA Work Plan."

6. The discussions of each alternative in Section 7, Detailed Analysis of Remedial Alternatives, indicate that, with the exception of Alternative 1 – No Action, all of the alternatives will result in a reduction of toxicity and mobility of contaminants; however, according to the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (October 1988, EPA/540/G-89/004), the reduction of toxicity, mobility, or volume through treatment evaluation criterion is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media. None of the proposed alternatives, with the possible exception of Alternative 5 (In-situ Reactive Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls), reduce the toxicity and volume of the contaminants through treatment. Treatment requires a chemical or biological transformation or an immobilization/stabilization process (e.g., by binding contaminant molecules into a cement matrix). All applicable subsections of Section 7 should be revised to indicate that the remedial alternatives for SWMU 6 do not include treatment. Also, Alternative 5 should include details on whether the reactive cap treats the chemicals of concern (COCs). In addition, revise the alternative rankings in Tables ES-1 and 7-3, Comparative Analysis of Remedial Alternatives, based on a complete analysis of the "reduction of toxicity, mobility, or volume through treatment" criterion.

Navy Response:

The Section 7 text has been modified to indicate Alternative 5 is the only alternative that technically involves reduction in toxicity through treatment. However, the text of the remaining alternatives (except Alternative 1) has been modified to indicate that although they are not technically "treatment" alternatives, they (as applicable by alternative) do reduce toxicity and/or mobility and/or volume of contaminants. For example, although Alternative 3 is not technically a "treatment" alternative, it does reduce the toxicity, mobility, and volume of contaminants at the site by removing contaminated sediment.

The text under Alternative 5 has been revised to indicate the blended organo clay and apatite in the RCM adsorbs metals and PCBs.

The symbols in alternative ranking Tables ES-1 and 7-3 remain unchanged in terms of TMV reduction, but a footnote has been added indicating that Alternatives 2, 3, 4, and 6 are not technically "treatment" alternatives, but employ technologies that affect toxicity and/or mobility and/or volume of contaminants.

7. The discussions of Alternatives 2, 4, and 5 under Section 6, Development of Remedial Alternatives, indicates that sediment samples collected as part of the monitoring program will be analyzed for PCBs, cadmium, copper, lead, and zinc. The cost estimates for these alternatives presented in Appendix G, Cost Estimate for

Alternatives, indicate that sediment samples will be analyzed for PCBs, lead, and zinc only. Revise the FS to resolve this discrepancy and ensure the costs accurately reflect the proposed analytical suite.

Navy Response:

Please refer to the response to Specific Comment #10 for rationale for PCB, lead, and zinc analyses only. Section 6 has been revised to exclude cadmium and copper from LTM sampling.

8. With the exception of Alternatives 1 and 2, each alternative has the potential to impact the wetland habitat. Therefore it is recommended that a wetlands assessment and restoration plan be prepared for any wetlands impacted or disturbed by the remedial activities (Clean Water Act Section 404, Protection of Wetlands E.O. 11990, 40 CFR 6 App A). Additionally, whenever possible, Management Practices (according to Federal Register Vol. 51, No. 219, Part 330.6) should be followed to minimize unavoidable impacts to wetlands to the maximum extent practicable while designing/implementing the remedy.

Navy Response:

As discussed in the August 2012 Technical Subcommittee meting, the site was a wetland (periodically indundated) and is a wetland (shallow marine) and all remedial actions would result in a site that is still a wetland (assuming the filling alternative includes a specific final land soil surface elevation that allows for restoration of the previous periodically-inundated wetland). Under these circumstances, no wetland mitigation would be necessary for any of the alternatives; instead wetland restoration is all that would be required. This information has been included in Alternatives' 3, 4, 5, and 6 discussion as follows:

The fifth bullet under Alternative 3 (now labeled as Section 6.3) has been modified to read: "Wetland restoration activities such as additional vegetative enhancement . . . . "

The third bullet under Alternative 4 (now labeled as Section 6.4) has been modified to read: "Wetland restoration activities such as additional vegetative enhancement . . . . "

The third bullet under Alternative 5 (now labeled as Section 6.5) has been modified to read: "Wetland restoration activities such as additional vegetative enhancement . . . . "

The following sentence has been added at the end of the fourth bullet under Alternative 6 (now labeled as Section 6.6): "The actual soil depth would depend on site-specific conditions, but would be installed to bring the final land soil surface to an elevation that allows for restoration of the pre-removal-action periodically-inundated wetland."

Specific Comments

1. **Section 2.3.1 Post-removal Conceptual Site Model, Page 2-3:** Please include a figure which identifies surface water sample locations and exceedances of ecological surface water screening values.

Navy Response:

The last sentence of the second paragraph of Section 2.3.1 has been revised to read: "**Figure 2-3** and **Figure 2-4** show the ecological COC concentrations exceeding Marine Sediment Ecological Screening Values (ESVs) and Marine Surface Water (ESVs), respectively."

2. **Section 5.4 Preliminary Remedial Goals, Page 5-2:** A performance goal for the "establishment of the benthic community" is mentioned, but additional details regarding how a viable benthic community will be determined is not provided. For example, will background benthic communities be assessed, or will specific sediment physical parameters be recommended (e.g. TOC concentrations, grain size, etc.) to ensure the establishment of a sizable and diverse benthic community necessary to support the expected wildlife

populations? Further, it is unclear why this performance goal is only applied to Alternative 2, rather than all alternatives (with the exception of Alternative 1 - No Action).

Navy Response:

As noted in the response to EPA evaluation of the response to General Comment 1, the Vieques Technical Subcommittee concurred during the October 2012 meeting that a generic RAO for the benthic community would be developed for Alternatives 2 through 5. That generic RAO has been prepared as is included in the aforementioned response. Depending on the actual remedy selected, details regarding how a viable benthic community will be determined (i.e., benthic community monitoring frequency and protocol) will be documented in the LTM Work Plan, which will be subject to regulatory agency review and approval.This level of detail is not necessary for an FS.

3. **Section 5.4 Preliminary Remedial Goals, Page 5-2:** ER-Ms for lead and zinc are proposed as PRGs, and the authors indicate that "the past use of ER-M values as remediation criteria at other CERCLA sites" as justification for their use. Please provide further details regarding other CERCLA sites where ER-Ms were selected as PRGs. Further, it is indicated that the ER-Ms for cadmium and copper are greater than the maximum detected concentrations in SWMU 6 lagoon sediment. Therefore, it is unclear why the discussion of long-term sediment monitoring includes these two inorganics.

Navy Response:

Examples of past use of ER-Ms as PRGs are attached, and include EPA issued RODs for Norfolk Naval Base (Sewells Point Naval Complex), and Jacks Creek/Sitkin Smelting and Refining site. In each example, the ER-M for lead (the value current at the time the ROD was issued) was selected as the sediment PRG.

Analysis of cadmium and copper has been removed from long-term sediment monitoring since maximum concentrations are below the ER-Ms. This applies to Alternatives 2, 4, and 5 (Sections 6.2, newly labeled 6.4, and newly labeled 6.5).

4. **Section 5.6.1 Description of Technologies, Monitored Natural Recovery, Page 5-5:** Additional studies are needed to better understand sediment depositional rates in the lagoon and to determine whether remedial goals will be met within an appropriate time frame.

Navy Response:

As concurred upon during the August 2012 Technical Subcommittee meeting, studying sedimentation rates is not necessary prior to selecting a remedy, but could be evaluated during LTM. It was noted by EPA during that discussion that including contingencies based on sedimentation observations can be included, which is often done for remedy decisions.

5. **Table 5-1(e) Federal-Action Specific ARARs, page 5 of 7:** As discussed under general comments, please include Clean Water Act Section 404, Protection of Wetlands E.O. 11990, 40 CFR 6 App A as an ARAR, and note that a wetland mitigation plan will be needed if the wetland is impacted or disturbed by remedial activities. A "net loss of wetlands" is not the only prerequisite for the development of a wetlands mitigation plan. Please delete this language.

Navy Response:

Please see the response to General Comment #8.

6. **Table 5-3 Technology Screening Summary, Monitored Natural Recovery, Descriptions**: In the last sentence in this section indicate that periodic sediment monitoring "should be" rather than "can be" incorporated.

Navy Response:

There are various ways in which to monitor natural recovery and periodic sediment monitoring may or may not be deemed necessary.

7. **Section 6.2, Alternative 2 – Monitored Natural Recovery and Land Use Controls, Page 6-1:** This section states, "MNR is especially amenable for sites with relatively low human health and ecological risks through two primary natural mechanisms: (1) burial of contaminated sediments by natural deposition; and (2) sequestration or transformation of contaminants through biological, chemical, or physical processes to less toxic or bioavailable forms." However, a demonstration that sequestration or transformation of COCs will occur at the site is not included. Revise the FS to include this information.

Navy Response:

The following sentences have been added after the sixth sentence of the first paragraph of Section 6.2: "MNR of PCBs in the sediment is primarily through natural covering of fresh sediment from deposition and adsorption to organic matter in the sediment, although anaerobic biodegradation may occur albeit relatively slowly. MNR of metals is primarily through precipitation as metal sulfides during anaerobic sulfate reduction process and natural covering of fresh sediment from deposition."

8. **Section 6.2, Alternative 2 – Monitored Natural Recovery and Land Use Controls, Page 6-2:** As discussed above, additional information regarding how a performance goal for the establishment of the benthic community will be assessed. As there are no PRGs for cadmium and copper (second bullet) it is unclear why samples will be analyzed for these COCs and how contaminant concentrations will be assessed.

Navy Response:

Please see the response to Specific Comment #3.

9. **Section 6.2, Alternative 3 - Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment, Page 6-2:** Please note that depending upon the depth of excavation needed to meet PRGs, the addition of organic fill may be needed to reduce the depth of the pool in order to minimize the potential for the area to become anoxic.

Navy Response:

As discussed in the August 2012 Technical Subcommittee meeting, adding organic fill would make it more likely the lagoon would become anoxic.

10. **Section 6.4, Alternative 4 - In-situ Sand Capping of Contaminated Sediment, Long-term Monitoring and Land Use Controls, Page 6-3:** In the first bullet please indicate at what point temporary erosion control measures would be removed. As per previous comments, please provide justification for sampling cadmium and copper in sediment (fourth bullet). Justification for the presumed 10 years allotted for monitoring should be included. Please note that the placement of two feel of sand will greatly reduce the size of the wetland area, returning a portion of the site to upland (terrestrial) habitat. Figures showing the reduction in open water and the loss of wetland acreage should be provided. Note that a wetland mitigation plan will need to be included as part of the remedial design if this alternative is selected.

Navy Response:

Please see the responses to Specific Comment #3, General Comment #2, and General Comment #8. With respect to the temporary erosion control portion of the comment, the following sentence has been added at the end of the first bullets under Alternative 4 (now labeled as Section 6.4) and Alternative 5 (now labeled as Section 6.5): "The temporary erosion control measures will be removed after the completion of remedial construction (i.e., wetland restoration)."

Figures ES-7, and ES-8, 6-4, and 6-5 have been revised to show the estimated reduction in open water area.

11. **Section 6.4, Alternative 5 - In-situ Reactive Capping of Contaminated Sediment, Long-term Monitoring, and Land Use Controls, Page 6-4:** In the first bullet please indicate at what point temporary erosion control measures would be removed. As per previous comments, please provide justification for sampling cadmium and copper in sediment (fourth bullet). Justification for the presumed 10 years allotted for monitoring should be included. Figures showing the reduction in open water and the loss of wetland acreage should be provided. Note that a wetland mitigation plan will need to be included as part of the remedial design if this alternative is selected.

Navy Response:

Please see the response to Specific Comment #10.

12. **Section 6.5, Alternative 6 - Soil Covering for Entire Lagoon and Land Use, Page 6-5:** As wetland habitat will be lost, a wetland mitigation plan will need to be included as part of the remedial design if this alternative is selected.

Navy Response:

Please see the response to General Comment #8.

13. **Section 6 Figures:** These figures differ than those provided in Section 2 which clearly show a land area in the eastern portion of the Site, where one soil sample was collected (Sample VWW06-SD008). Please amend these figures as appropriate.

Navy Response:

Section 6 figures have been revised as requested.

14. **Section 7.1 Evaluation of Criteria:** The cost of the potential need to backfill following excavation (Alternative 3) as well as the cost of wetland restoration and mitigation (Alternatives 3-6) needs to be considered for each of these alternatives.

Navy Response:

Alternative 3 does not require backfilling of the sediment excavation area. Please also see the response to General Comment #8.

15. **Section 7.2.2, Criteria Assessment for Alternative 2, Page 7-4:** The third paragraph of this section states that "one 5-year review is assumed to be required to assess whether unacceptable risk remains. Additional 5-year reviews would be required if the sediment [preliminary remediation goals] PRGs had not been met in 5 years." It is unclear how these statements account for the potential presence of PCBs in blue crab and fish at unacceptable concentrations after the first five years. It appears that maintenance of land use controls (LUCs) are necessary to prevent human exposure to PCBs in blue crab and fish until such time when no unacceptable risk remains. Revise Section 7.2.2 to acknowledge that five-year reviews are required to monitor LUCs while unacceptable risk to humans from consumption of blue crab and fish remains.

Navy Response:

Please see the response to General Comment #2.

16. **Table 2-1, Post-Removal Surface Soil Detection and Exceedance Summary:** The source of the Ecological Screening Values (ESVs) cited in Table 2-1 are not identified in the text or table. Revise the FS to identify the source(s) of the ESVs. This comment also applies to Table 2-2, Post-Removal Sediment Detection and Exceedance Summary, and Table 2-3, Post-Removal Surface Water Detection and Exceedance Summary.

Navy Response:

The following footnotes have been added:

Table 2-1

Vieques Soil ESVs – source of soil ecological screening values is the ERA protocol (CH2M HILL, 2010b; 2010c)

Table 2-2

Eco Marine - Sediment – source of sediment ecological screening values is the ERA protocol (CH2M HILL, 2010b; 2010c)

Table 2-3

Eco Marine - Surface Water – source of surface water ecological screening values is the ERA protocol (CH2M HILL, 2010b, 2010c)

17. **Table 7-3, Comparative Analysis of Remedial Alternatives:** It is unclear whether the analysis of the short-term effectiveness of each alternative took into account the amount of time necessary to achieve RAOs (in addition to the protection of workers and community and environmental impact factors). For example, Alternative 2 – Monitored Natural Recovery (MNR) and LUCs is ranked as "excellent/fully meets"; however, this alternative is estimated to take five years for contaminants to reach preliminary remediation goal concentrations. It is unclear how an estimation of five years was derived without studies detailing sediment depositional rates. Alternatives 4, 5, and 6 are ranked as "satisfactory"; yet, these alternatives achieve protection immediately upon implementation. Given that the types of alternatives proposed in the FS result in relatively low risk to workers and the community, and the fact that the SWMU 6 habitat appears to be rather resilient (given its development since the 2009 removal action) it appears that alternatives which achieve RAOs in a shorter time frame should be ranked higher than those which require a longer time frame. Revise the short-term effectiveness rankings accordingly, or provide additional justification for the assigned rankings.

Navy Response:

The short-term effectiveness evaluation of each alternative does take into consideration the time to achieve the RAOs, as shown in Table 7-1. However, the table also shows that short-term effectiveness includes consideration of short-term risk to the community, potential environmental impacts of the remedial alternative, and environmental footprint, which are not all equal or similar across the various alternatives. Therefore, ranking the alternatives by the timeframe to achieve the RAOs would not be appropriate; the evaluation must consider other factors, which are discussed in Table 7-1 and summarized, subjectively, in Table 7-3.

EPA Evaluation of Reponse:

Response does not appear to be correct and that the time to achieve RAO should be considered under short-term effectiveness as stated in on Page 6-7 of the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (October 1988, EPA/540/G-89/004).

Navy Evaluation Response:

The short-term effectiveness information in Table 7-3 (and associated text) has been updated to clarify the estimated time-frame for achieving RAO 1 is: 5 years, 6 months, 2 months, 2 months, and 6 months

for Alternatives 2, 3, 4, 5, and 6 respectively. Similarly, the estimated timeframe to achieve RAO 2 is 10 years for Alternatives 2, 3, 4, and 5. RAO 2 is not applicable to Alternative 6 as concurred upon during the October Technical Subcommittee Meeting.

18. **Appendix F, Section 1.5.2.1, Comparison With Surface Water ESVs, Page F-16:** It is unclear why cadmium and thallium were not retained as Chemicals of Potential Concern (COPCs) for surface water in the Baseline Ecological Risk Assessment (BERA). Unfiltered samples of both metals "had HQs [Hazard Quotients] exceeding one based upon mean detected concentrations and also exceeded background UTLs [Upper Tolerance Levels]." Although neither of these metals was detected in filtered samples, the mean detection limits for those samples exceeded their respective ESVs. This is especially true for thallium – its non-detected value [176 micrograms per liter (µg/l)] was over eight times greater than its ESV (21.3 µg/l). While filtered (i.e., dissolved) data are preferable to unfiltered (i.e., total) data, the high detection limits associated with the filtered data greatly reduces their reliability. Therefore, retain both cadmium and thallium as COPCs in order to be conservative, and revise the ERA accordingly.

Navy Response:

The first three sentences of Section 1.5.2.1, subsection BERA (Step 3A), have been replaced with the following:

> "Mean surface water concentrations are compared to ESVs and UTLs in Table F-23. Based upon this comparison for unfiltered samples, two metals (cadmium and thallium), each of which was detected in one of the five samples, had HQs exceeding one based upon mean detected (total metal) concentrations and also exceeded background UTLs. Neither of these metals was detected in filtered (dissolved metal) samples, although detection limits for all samples exceeded ESVs for both metals. Although the project quantitation limits for cadmium and thallium (1 and 10 µg/L, respectively) were well below the ESVs, media interferences (primarily sodium from the saltwater media) required samples to be diluted (20 X) before internal standards could be met, resulting in sample detection limits above ESVs. Uncertainty regarding marine surface water interference with metal detection limits is discussed further in Section 1.6 (Uncertainties). Considering the single detections of total cadmium and thallium in five unfiltered samples near the detection limits, the lack of detection of these metals in the dissolved phase, and with consideration of the uncertainties associated with detection limits above the ESVs as a result of media interference, cadmium and thallium were not retained as COPCs."

In Section 1.6 (Uncertainties), the sixth sentence of the first bullet has been replaced with the following:

> "In surface water, matrix interference affected the detection limits of metals, resulting in LODs above the project quantitation limits. Surface water at the SWMU 6 site is seawater with an average salinity of 31.2 parts per thousand, and, at the Laguna Kiani lagoon complex lobe, an average salinity of 38.0 parts per thousand. Instrument interference was primarily caused by calcium (range of 392 to 523mg/L), magnesium (range of 1,080 to 1,360mg/L), potassium (range of 408 to 544mg/L), and sodium (range of 10,300 to 15,900mg/L). Analysis of the lagoon samples caused the Inductively Coupled Plasma (ICP) instrument to shut down due to salt buildup on the tip of the nebulizer, affecting the aerosol flow rate and causing instrument drift. These interferences were addressed by sample dilution which reduced the actual measured concentration but increased reporting limits for both detected and nondetected metals. Dilutions for site samples were 20 X for SWMU 6, and 10 X for Laguna Kiani complex lobe. The final reported data are from the diluted runs with passing internal standards. In many cases, such as for aluminum, cadmium, lead, and thallium, the detection limits for diluted samples exceeded ESVs and therefore cause uncertainty regarding actual concentrations being present above the ESV. However, in surface water, the mean reporting limits were almost always less than 10 times ESVs and usually less than 3 times ESVs."

19. **Appendix F, Section 1.5.3.1 Comparison With Surface Water ESVs, Page F-19:** The ERA does not sufficiently explain why aluminum and lead were not retained as surface water COPCs for the Laguna Kiani complex lobe in the BERA. As shown in Table F-29, Screening Statistics - Surface Water - Offsite Laguna Kiani Complex Lobe, the mean concentrations of both constituents exceeded their respective ESVs. Aluminum also exceeded its background UCL. The detection limit for the non-detected lead sample (20 µg/l) was more than double the lead ESV (8.52 µg/l). Revise the ERA to better justify excluding aluminum and lead as COPCs in the BERA.

Navy Response:

The first three sentences of Section 1.5.3.1, subsection BERA (Step 3A), have been replaced with the following:

> "Mean surface water concentrations are compared to ESVs and UTLs in Table F-29. Based upon this comparison for unfiltered samples, two metals (aluminum and lead) had HQs exceeding one based upon mean detected (total metal) concentrations and also exceeded background UTLs (where available), although the maximum ratio to background for aluminum was just above one (1.04). Neither of these metals was detected in filtered (dissolved metal) samples; although mean detection limits exceeded ESVs for both metals, the mean detection limit for aluminum did not exceed the background UTL and only slightly exceeded the background UTL for lead. The project quantitation limits for aluminum and lead (100 and 1 µg/L, respectively) could not be met because media interferences (primarily sodium from the saltwater media) required samples to be diluted (10 X) before internal standards could be met. Uncertainty regarding marine surface water interference with metal detection limits is discussed further in Section 1.6 (Uncertainties). Considering the lack of detection of these metals in the dissolved phase, and with consideration of the uncertainties associated with detection limits above the ESVs as a result of media interference, aluminum and lead were not retained as COPCs."

Section 1.6 (Uncertainties) has been updated as described in the response to Specific Comment #18.

20. **Appendix F, Section 1.5.6.1, Aquatic Habitats, Page F-21:** 2-Butanone and carbon disulfide were not retained as COCs for sediment at SWMU 6. The discussion in this section cites Equilibrium Partitioning (EqP) values which were reportedly compared to these constituents. However, Table F-25, Comparison of Sediment Step 3A COPC Concentrations With Equilibrium Partitioning-Based Sediment Values - SWMU 6 Lagoon, lists "NSV" (No Screening Value) for both 2-butanone and carbon disulfide. While 2-butanone did not exceed its EqP value, justifying its exclusion as a COC, the maximum, 95 % Upper Confidence Limit (UCL), and arithmetic mean concentrations of carbon disulfide all exceeded its cited "comparable" EqP value (1.65 µg/kg). However, carbon disulfide was eliminated as a COC because it "was detected in only 3 of 8 site samples and has no known site source." Although it is noted that carbon disulfide can be naturally produced in wetlands, a relatively wide range of materials was disposed at SWMU 6, so it seems plausible that the source could be anthropogenic. Also, given the low number of samples analyzed for carbon disulfide, its detection in 37.5% of the samples seems relevant. Revise the ERA to better justify excluding carbon disulfide as a sediment COC. Also, revise Table F-25 to include the cited EqP values for 2-butanone and carbon disulfide. Finally, explain in the text or tables the term "comparable" when referring to the EqP for carbon disulfide.

Navy Response:

In Section 1.5.6.1, the third paragraph under the heading "Sediment" has been changed to the following to better justify excluding carbon disulfide:

> "2-Butanone and carbon disulfide were identified as Step 3A COPCs because they were detected but ESVs, background UTLs, and marine sediment EqP values were not available. However, freshwater EqP values for these VOCs are available in the literature (Jones et al., 1997) and have been included in Table F-25. The maximum detected concentration of 2-butanone (47.3 µg/kg) was less than the site-specific TOC-adjusted freshwater EqP value (386 µg/kg) and therefore does not warrant being considered a COC. The maximum detected concentration of carbon disulfide (13.0 µg/kg), as well as

the 95% UCL (6.2 µg/kg) and arithmetic mean (3.5 µg/kg), were greater than the EqP value (1.22 µg/kg); the arithmetic mean HQ equals 2.9. Carbon disulfide was detected in 3 of 8 site sediment samples. The SWMU 6 site was used during the 1960s and 1970s for the disposal of general solid waste, which included empty containers of lubricants, oil, solvents, and paints; broken glass; and rubble. Though it is possible that limited amounts of carbon disulfide could have been discarded with the debris, other factors such as its high volatility, age of the site (over 30 years), low affinity for sorption to organic substances (log Koc = 1.79) such that it is unlikely to partition to or remain in sediment, and an estimated half-life in sediment of 7.4 months (Abrams et. al., 1975), provide evidence that site-related carbon disulfide is unlikely present. Carbon disulfide is known to be produced naturally by sediment microorganisms in wetlands. Prior to the removal action, SWMU 6 was predominately an estuarine, intertidal, forested wetland dominated by black mangrove, and under current, post-removal conditions has remained a marine wetland habitat, with a shallow open water lagoon surrounded by mature mangroves and supporting rapidly growing mangrove seedlings. It is therefore reasonable to expect naturally produced, low levels of carbon disulfide in site sediment. For these reasons, carbon disulfide was not considered to be a COC."

The freshwater EqP values for 2-butanone and carbon disulfide were added to Table F-25, as well as to Table F-34, which evaluates surface water data for the Laguna Kiani complex lobe. The term "comparable" has been removed from this assessment.

Reference (has been added to Appendix F, Section 1.7)

Abrams EF, Derkics D, Fong CV, Guinan DK, Slimak KM (1975) Identification of organic compounds in effluents from industrial sources. Washington, DC, US Environmental Protection Agency (EPA-560/3-75-002; PB 241 641 OBA).

21. **Table F-16, Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates**: For several constituents listed in Table F-16, the comment "Geometric mean of target and SRC values" is listed. However, the acronym "SRC" is not defined in the table or a footnote. Revise the table to include a definition for "SRC."

Navy Response:

The acronym "SRC" has been changed to "serious risk concentration" where it occurs within Table F-16.

22. Appendix F, Table F-28 and Attachment C-6 (page 9 of 12): Please ensure that the NOAEL Arcolor-1254 HQ for the fishing bat is consistent between these two tables.

Navy Response:

Table F-28 summarizes HQs for aquatic wildlife (including the fishing bat) based on mean exposures, while Attachment C-6 calculates HQs based on 95% UCL exposures. Therefore, the HQ values between these tables should not be the same, and no change is needed. Consistency between all aquatic food web HQ summary tables (Tables F-26, F-27, and F-28) and supporting calculations in Attachments C-1 through C-9 have been double-checked and confirmed to be consistent.

23. **Appendix G, Cost Estimate for Alternatives, Alternative 2 – Monitored Natural Recovery:** The cost estimate for Alternative 2 includes an escalation factor of 130%; however, a rationale for the escalation is not provided. It is noted that the cost estimate for Alternative 4, In-situ Sand Capping of Contaminated Sediments, includes the same escalation factor with the note "with 30% increase for Vieques." The escalation factor for Alternative 2 should include a rationale and be consistent with the other cost estimates. Further, escalation factors were not included for Alternative 3, Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment or Alternative 6, Soil Cover for Entire Lagoon. For consistency, escalation factors should be the same across all alternatives and include a clear rationale. Revise the FS to include this information.

Navy Response:

The cost estimate has been revised to ensure the same escalation factor is used for all alternatives. The rationale of 130% is based on cost escalation for Vieques as compared to cost for US Mainland.

24. **Appendix G, Cost Estimate for Alternatives, Alternative 4 – In-situ Sand Capping of Contaminated Sediments and Alternative 5 – In-situ Reactive Capping of Contaminated Sediment:** The estimates for Alternatives 4 and 5 appear to include costs for wetland planting and re-vegetation twice. Based on review of the alternatives, it is unclear why this task would be completed twice. Revise the FS to justify why these costs are included twice in the estimates, or revise the estimates accordingly.

Navy Response:

The cost estimate has been revised to remove one of the revegetation costs.

25. **Appendix G, Cost Estimate for Alternatives, Alternative 2 – Monitored Natural Recovery, Alternative 4 – In-situ Sand Capping of Contaminated Sediments, and Alternative 5 – In-situ Reactive Capping of Contaminated Sediment:** The estimate for vegetation enhancement under Alternatives 2 and 5 is $66,095, whereas the estimate for vegetation enhancement under Alternative 4 is $50,842. It appears that the vegetation enhancement task is the same for each alternative; as such, it is unclear why there is a difference in costs. Revise the FS to justify the difference in costs or revise the estimates accordingly.

Navy Response:

The vegetation enhancement cost estimate has been revised for Alternative 4 has been revised to match that of Alternatives 2 and 5.

Minor Comment

1. **Under Section 6, Development of Remedial Alternatives, th**e formatting of the subsection for Alternative 3 – Excavation, Dewatering, and Off-site Disposal of Contaminated Sediment is in need of revision such that it has its own numbered subheading. See the fifth bullet on Page 6-2.

Navy Response:

The formatting in Section 6 has been edited.

Comments from e-mail from Julio Vazquez to Kevin Cloe on 8-6-12:

1. Figures ES-7 and ES-8: The key on this figure shows a sand cap and contaminated sediment, however neither a sand cap nor contaminated sediment is included in the figure. Please revise.

Navy Response:

The aforementioned keys on Figures ES-7 and ES-8 (as well as Figures 6-4 and 6-5) have been removed as they are not pertinent to the figures. The figures have been revised to show the estimated reduction in open water area, which correponds to the area with the contaminated sediment and cap.

2. Section 3: This section summarizes the results of the HHRA found in Appendix E. It is not typical that a risk assessment is an attachment to the FS; rather, the HHRA is usually Chapter 6 of the RI report. Although the

second paragraph of this section refers the reader to Appendix E for the complete risk assessment, the summary presented in Section 3 appears to be somewhat brief and not particularly easy to follow. For example, Section 3.1 does not fully explain the process that was followed to identify COPCs - the screening out of mercury in sediment based on background concentrations is not described in this discussion. It might be helpful to either expand Section 3 to present more detail, or refer the reader to specific sections of Appendix E. This additional referencing or information would add to the transparency of the risk estimates.

Navy Response:

The fifth paragraph of Section 3.1 was revised to state:

"The EPA's RSLs for Chemical Contaminants at Superfund Sites (EPA, 2012) were used to screen site data, with the exception of the fish and blue crab consumption pathways. The maximum detected concentrations in surface soil, sediment (direct contact pathways only), and surface water (direct contact pathways only) were compared to RSLs to identify COPCs for the HHRA. For the fish and blue crab consumption pathways, surface water and sediment samples were initially screened using the qualitative and quantitative approaches discussed in Section 2.2.1 of Appendix E. Based on the initial risk screening using modeled concentrations from sediment and surface water, four COPCs (lead, thallium, zinc, and PCBs) were identified as the primary risk drivers for the fish and blue crab consumption pathways. Therefore, measured fish and blue crab concentrations of these four analytes were used in a supplemental COPC screening process. Due to the lack of appropriate screening levels for biota samples, the measured constituents were identified as COPCs if they were detected in the biota samples.

The maximum detected concentrations in surface soil, sediment, surface water, blue crab, and fish were compared to representative background levels, as discussed in Section 2.2.2 of Appendix E. Although some inorganic chemicals were detected at concentrations less than the established background concentrations, inorganic chemicals were not eliminated as COPCs based on comparison to background for soil, surface water (direct contact pathways only), and sediment (direct contact pathways only). Inorganic chemicals detected in sediment and surface water at concentrations less than their respective background values were eliminated as COPCs for the fish and blue crab consumption pathways. This approach was approved by EPA Region 2 and the PREQB during the Vieques Technical Subcommittee Meeting held on October 26, 2011. Two inorganic chemicals (iron and mercury) in surface water and three inorganic chemicals (arsenic, hexavalent chromium, and mercury) in sediment were eliminated as COPCs for the fish and blue crab consumption pathways based on the background comparison."

A paragraph describing the hotspot analysis was added after the last paragraph of Section 3.2:

"A hot spot evaluation was conducted for soil, sediment, and surface water at SWMU 6 to determine if any areas at SWMU 6 may require a separate exposure evaluation. The detected concentrations were compared to 10 times the adjusted industrial soil and tapwater RSLs (i.e., resulting in an HQ = 1.0 and ELCR of 1x10-5) to determine the presence (if any) of a discrete area where concentrations are considerably higher than those present in the surrounding area. Detected concentrations of arsenic at three sediment sample locations, chromium (VI) at four sediment sample locations, and thallium at one sediment location exceeded 10 times their respective residential soil RSLs. All four of the COPCs identified in surface water (antimony, cadmium, chromium (VI), and thallium) exceeded 10 times their respective RSLs. As discussed in Section 2.3 of Appendix E, a graphical review of the soil, sediment, and surface water data indicates that the detected concentrations are distributed relatively evenly without any discrete area of elevated concentrations. Therefore, it was concluded that no discrete hot spots are present that warrant a separate risk evaluation."

Additionally, the third and fourth sentences in the first paragraph of Section 3.3 were revised to state:

"Risk estimates were calculated for potential receptors and exposure pathways using conservative assumptions for exposure factors and exposure point concentrations, as discussed in Section 3.2 of

Appendix E. The equations used to estimate potential non-carcinogenic, carcinogenic, and mutagenic effects are provided in Sections 5.1, 5.2, and 5.3 of Appendix E, respectively. The EPA's Adult Lead Methodology (ALM) and Integrated Exposure Uptake Biokinetic (IEUBK) Model were used to evaluate potential site-specific exposures to lead, as discussed in Section 4.4 of Appendix E (EPA, 2009b; 2010)."

3. Page 3-3, Section 3.3 Risk Estimates: For any noncancer hazard indices that exceed the benchmark of 1, please include the actual hazard index in the summary. As presented, the hazard index is written as ">1", but the actual value should be provided.

Navy Response:

In Section 3.3, the following text has been added to the indicated bullets for Recreational Users/Trespassers/Site Visitors:

"(hair [6] due to thallium)" has been added at the end of the bullet for adult, "(hair [8] due to thallium)" has been added at the end of the bullet for youth, and "(hair [15] due to thallium)" has been added at the end of the bullet for child.

The first three bullets for fish consumers have been revised as follows:

- "Adult - $1x10^{-3}$ cumulative ELCR and three target organ-specific HIs>1 (reproduction [26] due to dioxin-like PCBs in fish, and eyes [31] and finger nails [33] due to non-dioxin-like PCBs in fish)
- Youth - $1x10^{-3}$ cumulative ELCR and three target organ-specific HIs>1 (reproduction [47] due to dioxin-like PCBs in fish and eyes [55] and finger nails [55] due to non-dioxin-like PCBs in fish)
- Child - $8x10^{-4}$ cumulative ELCR and three target organ-specific HIs>1 (reproduction [61] due to dioxin-like PCBs in fish, and eyes [47] and finger nails [47] due to non-dioxin-like PCBs in fish)."

The first three bullets for crab consumers have been revised as follows:

- "Adult - 3x10-4 ELCR and three target organ-specific HIs>1 (reproduction [3] due to dioxin-like PCBs in blue crab, and eyes [3] and finger nails [3] due to non-dioxin-like PCBs in blue crab)
- Youth - 2x10-4 ELCR and three target organ-specific HIs>1 (reproduction [5] due to dioxin-like PCBs in blue crab, and eyes [5] and finger nails [5] due to non-dioxin-like PCBs in blue crab)
- Child - 2x10-4 ELCR and three target organ-specific HIs>1 (reproduction [6] due to dioxin-like PCBs in blue crab and eyes [7] and finger nails [7] due to non-dioxin-like PCBs in blue crab)".

4. Page 3-5, Section 3.4 Thallium in Surface Water: Thallium was detected at a frequency of 1/5 in surface water. The text on Page 3-5 states that thallium in surface water is "...wholly or primarily attributable to background and not identified as a COC for the following reasons...." The second bullet states that thallium was not detected in background surface water at a a detection limit of 88 ug/l; the detected onsite concentration was 121 ug/l. It is unusual to consider a chemical present as a result of background when it wasn't found in background, and it was found onsite at a concentration greater than the background detection limit. Please either clarify this or remove this as a basis for not selecting thallium as a COC.

Navy Response:

Background was removed as a basis for not selecting thallium as a COC; however, if thallium in surface water was site-related, it would likely be detected in multiple soil, sediment, and surface water samples. Thallium was not detected in soil and was only detected in one sediment sample and one surface water sample. Additionally, thallium was not identified as a COC in other media at SWMU 6, and was not detected in biota. Because thallium is unlikely to be related to former site releases, it is not identified as a

COC in surface water. The subsection "Thallium in Surface Water" in Section 3.4 and Section 5.5.2 in Appendix E have been revised to state:

"Thallium in surface water is not likely site-related and is not identified as a COC for the following reasons:

- It was detected in only one of five surface water samples (location VWW06-SW003, at the northern end of the lagoon) and one of seven sediment samples (location VWW06-SD005, at the southeastern end of the lagoon). Thallium was not detected in soil or biota at the site. If thallium was site-related, it would likely be detected in multiple soil, sediment, and surface water samples and potentially in site-related biota.
- Over the exposure duration, human receptors would be exposed to more concentrations than the maximum detected concentration and would pass through other, lower concentrations in the lagoon to access location VWW06-SW003.
- Thallium was not identified as a COC in other media at SWMU 6.

5. Page 5-2, Section 5.2 RAOs: Page 3-3, Section 3.3 presents the site risks estimated at SWMU 4 and includes excess lifetime cancer risks ranging from 2 x 10-4 to 5 x 10-4 for adult, youth, and child recreational users/trespassers/and site visitors exposed to surface water and sediment, with surface water being the primary risk driving medium. If these risks cannot be explained or qualified in some way, an RAO, and potentially PRGs, should be developed to address this risk which exceeds acceptable levels.

Navy Response:

The ELCR and HI exceedances in surface water are attributable to hexavalent chromium and thallium, respectively. These two COPCs were not identified as COCs in surface water because they were attributable to background concentrations (hexavalent chromium) or not site-related (thallium), as discussed in Section 3.4.

EPA/ROD/R03-97/087
1997

EPA Superfund
Record of Decision:

JACKS CREEK/SITKIN SMELTING & REFINING, INC.
EPA ID: PAD980829493
OU 01
MAITLAND, PA
09/30/1997

<IMG SRC 970870>
§
§

RECORD OF DECISION
JACK CREEK/SITKIN SMELTING & REFINING INC. SITE

SITE NAME AND LOCATION

Jacks Creek/Sitkin Smelting & Refining Inc. Site
Village of Maitland
Mifflin County, Pennysylvania

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Jacks Creek/Sitkin Smelting & Refining Inc. Site (Site) in the village of Maitland, Mifflin County, Pennsylvania, developed and chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. °° 9601 et seq., and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision is based on the Administrative Record file for this Site.

The Commonwealth of Pennyslvania, Department of Environmental Protection has concurred with the selected remedy.

ASSESSMENT OF THE SITE

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. ° 9606, that actual or threatened releases of hazardous substances from this Site, as specified in Section II Summary of Site Risks, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to the public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

The selected remedy is a permanent remedy for cleanup of the entire Site. The selected remedy includes the following components:

Soils with lead concentrations above 40,000 parts per million (ppm), which are the principal threat wastes, shall be excavated and treated at an offsite hazardous waste treatment facility using a chemical stabilization process.

Waste pile materials and soils with lead concentrations between 1,000 and 40,000 ppm lead shall be excavated and then consolidated onsite. Sediments from depositional areas of Jacks Creek exceeding 110 ppm lead in the immediate vicinity of the Site shall be removed from the creek by vacuum dredging, and then consolidated with the waste piles and contaminated soils.

The consolidated soils, waste materials and sediments shall be covered with a layer of crushed limestone, and then covered with a multi-layer cap.

All excavated areas shall be covered with clean fill to the original grade and then all of these areas, except for the scrap yard shall be revegetated.

The existing onsite wetlands, which in total are approximately one-fifth of an acre in size, will be recreated in an onsite location. Fish consumption advisories will be posted along portions of Jacks Creek.

Buildings that are structurally unsound shall be demolished.

Long-term monitoring of the ground and surface water, as well as the fish and benthos in Jacks Creek, shall be done as part of the operation and maintainence of the Site.

Deed restrictions shall also be placed on a portion of the Site to restrict use of the capped area, and to limit other areas of the Site to industrial activities.

STATUTORY DETERMINATIONS

Pursuant to duly delegated authority, I hereby determine that the selected remedy is protective of human health and environment, complies with Federal and State requirements that legally are applicable or relevant

and appropriate requirements (ARAR) to the remedial action, and is cost effective. The remedy satisfies the statutory preference for remedial actions in which treatment that reduces toxicity, mobility, or volume is a principal element. Finally, it is determined that this remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. See Section 121(b) and (d) of CERCLA, 42 U.S.C. º 9621(b) and (d).

Because this remedy will result in hazardous substances remaining onsite above health-based levels, a review will be conducted every five years after commencement of remedial action in accordance with Section 121(C) of CERCLA, 42 U.S.C. º 9621(c), to ensure that human health and the environment continue to be adequately protected by the remedy.

<IMG SRC 97087A>

RECORD OF DECISION
TABLE OF CONTENTS

	PAGE
I. SITE NAME, DESCRIPTION, AND LOCATION	1
A. Site Name and Location	1
B. Site History	1
C. Highlights of Community Participation	5
D. Site Characteristics	6
E. Nature and Extent of Contamination	6
II. SUMMARY OF SITE RISKS	8
III. DESCRIPTION OF ALTERNATIVES	13
IV. DESCRIPTION OF ALTERNATIVES	18
V. DESCRIPTION OF THE SELECTED REMEDY	23
VI. STATUTORY DETERMINATIONS	28
VII. RESPONSIVENESS SUMMARY	34

RECORD OF DECISION
JACKS CREEK/SITKIN SMELTING & REFINING INC. SITE
DECISION SUMMARY

I. SITE NAME, DESCRIPTION AND LOCATION

A. Site Name and Location

The approximately 105-acre Jacks Creek/Sitkin Smelting & Refining Inc. Site is located in the village of Maitland in a rural farming area of Mifflin County, Pennsylvania as shown on the Site Location map (Figure 1). The Site lies about five miles east of the Borough of Lewistown near the geographical center of the Commonwealth of Pennsylvania and is located at the border of Decatur and Derry Townships.

Land use at the Site is commercial/industrial and adjacent properties include residential land use. A total of 13 buildings are present on the Site, many of which are in a dilapidated condition. The Site contains two separate waste piles, the Ball Mill Tailings Pile and the Aluminum Dross Pile as well as seven lagoons. Several of the onsite buildings also contain waste or scrap materials. A railroad track runs northeast-southwest through the central portion of the Site. The Site is centered at 40!38'35" latitude and 77!28'34" longitude.

B. Site History

The prior owner of the property, Sitkin Smelting Company (Sitkin), operated at the Site from 1958 until 1977, smelting non-ferrous (non-iron) metals. Sitkin's main products from the smelting operation were several types of brass and bronze ingots. These ingots were produced by heating and refining scrap metal at high temperatures in onsite furnaces. Brass is an alloy of primarily copper and zinc, whereas bronze is an alloy of primarily copper and tin. Sitkin also operated a metal recycling operation that included aluminum, copper, and lead. Transformers and lead batteries were broken onsite and recycled for their lead content. Sitkin also contained a Preciosu Metals Building where precious metals (gold, platinum, etc.) were reclaimed from used products. See Figure 2 for the precious Metals Building's location.

Sitkin closed in 1977 when it declared bankruptcy. There has been no smelting or refining activity onsite since 1977. Joseph Krentzman and Sons, Inc. (Krentzman) currently operated onsite. Krentzman utilizes about half of the 105-acre Site for a scrap metal and aluminum recycling business employing approximately 85 people.

A preliminary Assessment was done at the Site4 in March 1984, and a Site Investigation was performed in October 1985. The Site was proposed for inclusion on the National Priorities List (NCP) in June 1988, with final listing in Cotober 1989. A preliminary Potentially Responsible Party (PRP) search was completed in December 1989, however a more extensive PRP search was completed in March 1994. Numerous removal actions have taken place on the Jacks Creek Site beginning in 1990.

<IMG SRC 97078B>
<IMG SRC 97078C>

Several of the removal actions were designed as interim measures to both limit erosion of contaminated soils into Jacks Creek and to restrict site access. Erosion control measures included construction of diking, installation of riprap in runoff channels, and an attempt to revegetate floodplain areas with soil-stabilizing grasses in May 1991. To limit the contaminants reaching Jacks Creek, a temporary cap was installed on the Ball Mill Tailings Pile, and several onsite lagoons were partially drained. An eight-foot high chain-link fence was installed around the eastern portion of the Site.

Materials were removed from the Site on several occasions as part of additional removal actions. Drums and other containers of bulk chemicals were over-packed, removed from the Precious Metals Building, and then disposed of at an offsite treatment facility. An investigation and cleanup of onsite radioactive telegraph/teletype machine static eliminators was also conducted. This equipment was removed from piles of telegraph machinery, and shipped offsite to a disposal facility. These removal actions were completed in January 1992. EPA mobilized again in December 1994 to make extensive repairs to the temporary cap on the Ball Mill Tailings Pile because it ripped during a thunderstorm containing high winds. In addition, several of the onsite berms, which were installed to control erosion into Jacks Creek, needed to be enlarged and reinforced.

Between 1990 and 1993, Gannett Fleming (Gannett) conducted a Remedial Investigation/Feasibility Study (RI/FS) under the direction of EPA to identify the types, quantities, and locations of contaminants and also to develp ways of addressing the contamination problems. As part of the RI, a number of samples, including air, water, soil, waste and even fish samples, were collected from the different areas of the Site. An inventory of the Site and its building was done, and a number of drums and a single vat containing soil-like materials were found in various locations across the Site. These drums and the vat were also sampled as part of the RI in order to determine if any contained high concentrations of hazardous substances.

In order to evaluate the extent of ground water contamination, Gannett installed and sampled nine onsite monitoring wells in the overburden or shallow aquifer. The depth to ground water in these shallow wells varied from 5 to 31 feet. Gannett also installed and sampled six onsite monitoring wells in the deeper bedrock aquifer. In addition, Gannett installed four offsite wells, three shallow wells and one bedrock well. Two of these offsite shallow wells were installed in the American Viscose property. The remaining offsite shallow well and the only offsite deep well were installed in the FMC Landfill property. All nineteen of these monitoring wells were sampled on three separate occasions. A total of six residential wells in the vicinity of the Site were also sampled during the RI.

A limited amount of additional offsite sampling, such as sampling the contaminated sediments, benthic invertibrates and fish of Jacks Creek, was also done during the RI. Fish sampling was performed using an electroshocker. In general, the stunned fish were identified, enumerated, measured and released. However, a total of 36 fish were retained for tissue analysis.

A wetlands identification and delineation was also conducted as part of the RI field work. Two small wetlands areas, of 7,500 square feet and 600 square feet were identified on the Site. The two wetlands areas combined as emrgent, temporarily flooded wetlands.

The Final RI report was produced by EPA in August 1993 and the Final FS report was produced in November 1993. in 1994, a number of the PRPs at this Site formed a group called the Jacks Creek PRP Group. They hired Parsons Engineering Science, Inc. (Parsons) to examine other cleanup alternatives for the Site. After this analysis, Parsons porduced an Addendum Feasibility Study in March 1995, which describes a variety of cleanup options at the Site. the Jacks Creek PRP Group also contracted Parsons to do modeling and leaching studies at the Jacks Creek Site. The field work for this study occurred in July 1995, and the Modeling and Leachability Report was submitted to the EPA in October 1995. In April 1996, EPA sampled four residential wells near the Site to assure that the ground water was still safe to drink in the nearby private wells.

The Jacks Creek PRP Group subsequently hired Alliance Environmental Services, Inc. (Alliance) to do additional ground water sampling of the existing monitoring wells at this Site. Alliance did the ground water sampling in June 1998, and submitted the results in August 1996. The PRP Group then hired Environ International Corporation (Environ) to do additional ground water modeling based on the most recent round of ground water sampling. Environ did this additional ground water modeling, and submitted its results in October 1996. All of these reports are part of the Administrative Record for the Site.

C. Highlights of Community Participation

In complying with Sections 113(k) and 117(a) of CERCLA, 42 U.S.C. °° 9613(k) and 9617(e), EPA performed the activities set forth in this Section. The RI/FS and Proposed Plan for the Jacks Creek Site were released to the public in February 1997. The documents were made available to the public in the local information and Administrative Record repository at the Mifflin County Library, 123 North Wayne Street, Lewistown, Pennsylvania and at EPA Region III offices. the notice of availability for these documents was published in the Lewistown Sentinel on February 27, 1997. A public comment period was held from February 27, 1997 through March 28, 1997. this comment period was extended until April 28, 1997 based on a written request received by EPA.

A public meeting was held on March 20, 1997 at the east Derry Elementary School. At this meeting, representatives from EPA and the Pennsylvania Department of Environmental Protection (PADEP) answered questions about the Site, and the remedial alternatives under consideration. Response to the comments received during this period are included in the Responsiveness Summary, which is Part VII of the ROD. This decision document presents the selected remedial action for the site chosen in accordance with CERCLA and the NCP. This decision is based on the Administrative Record file for this Site.

D. Site Characteristics

The Site lies within a deep valley in the Appalachian Mountain Section of the Valley and Ridge Physiographic Province. the mountains form a prominent northeast-southwest alignment of succesive narrow, steep-sided ridges and valleys. Jacks Creek flows in a southwesterly direction down the valley meandering closer to the northern ridge. Surface water from the Site drains northward to Jacks Creek, a tributary of the Juniata River. The creek is approximately 20 feet wide and 2 to 3 feet deep on average as it passes the Site. A portion of the Site, approximately 24 acres, lies in the 100-year floodplain of Jacks Creek. Jacks Creek is classified by the PADEP as having protected water uses for maintenance and/or propagation of cold water fish and additional flora and fauna which are indigenous to a cold water habitat. Sport fisherman utilize the stream for fishing throughout the year, especially downstream from the Site.

Geologic units in the area include both unconsolidated material and bedrock. The unconsolidated material consists of both soils and underlying saprolite. Saprolite is unconsolidated to semiconsolidated material resulting from chemical weathering of the parent rock. The subsurface at the Site can be divided into three hydrogeologic units: a perched water table of limited areal extent, an overburden aquifer unit, and a bedrock aquifer unit. The perched aquifer lies under and within the Ball Mill Tailings Pile. Water from this perched unit exhibits very distinct characteristics.

General climatic conditions at the Site are characterized by a humid continental climate. The average annual precipitation at Lewistown, Pennsylvania is 37.86 inches. A number of areas of stressed or dead vegetation are present onsite, and there are also several areas completely devoid of vegetation.

E. Nature and extent of Contamination

Based on the findings of the RI, the following areas and/or media have been found to be contaminated on the Site:

- Soils and lagoon sludges
- Waste piles
- Drums/vat
- Battery casings
- Scrap metal
- Buildings
- Ground water
- Jacks Creek

Soils and Sludges: Site surface soils were found to be contaminated with heavy metals including antimony, cadmium, copper, lead, selenium, silver and zinc, and organic contaminants including polychlorinated biphenyls (PCBs) and dioxins. Subsurface soil samples, collected from depths of six to 25 feet, showed that concentrations of copper, lead, and zinc are dramatically reduced with depth. Lead levels as high as 159,000 ppm were detected in onsite surface soils and large areas of the Site are consistently above 10,000 ppm. Sludge samples were collected from lagoons and ponded collection areas onsite. Copper, lead, and zinc were found in several lagoon sludges at high concentrations. Onsite ponded areas found to contain high concentrations of heavy metals. The regulatory limit for lead in the Toxic Characteristic Leaching Procedure (TCLP) samples was exceeded in four out of five lagoons and for cadmium in two out of five lagoons. The TCLP is a laboratory method that is used to determine the mobility of both organic and inorganic constituents present in liquid, solid and multi-phase wastes. In addition, TCLP limits were exceeded for cadmium in two other sludge samples.

Waste Piles: The Ball Mill Tailings Pile is the largest waste pile at the Site containing approximately 140,000 tons of brass dross fines. It contains high levels of heavy metals including barium, beryllium, antimony, cadmium, cobalt, copper, lead, nickel, silver, sodium, and zinc. TCLP extracts from the pile show that cadmium and zinc are leaching above regulatory levels. The Aluminum Dross Pile contauins high levels of aluminum, antimony, cadmium, chromium, copper, lead, nickel, silver, and zinc. TCLP analysis indicated lead exceeded the regultory limit of 5 micrograms per milliliter (g/ml).

Drums/Vat: Drum/vat contents are mostly soils, but several drums were found to contain elevated levels of antimony, beryllium, lead, silver, zinc, and cyanide. Some drum samples exceeded TCLP regulatory limits for cadmium and lead. Several drums and the vat were found to contain sludges which had elevated levels of cyanide.

Battery Casings: The former Sitkin battery breaking operation was the source of the battery casing piles observed on the surface over much of the Site. Used lead-acid batteries were brought to the Site and cracked open at the battery breaking shed where the sulfuric acid was recovered and the lead plates inside were removed for recovery at the lead smelter. The remaining plastic casings were then crushed, mixed with soil and are still stockpiled in several onsite areas.

Scrap Metal: Krentzman's active scrap metal operation includes both ferrous and aluminum reclamation, as well other metals and alloys. Various types of scrap metal are brought to Krentzman by truck or rail. The scrap is then sorted and stockpiled mainly west of the old smelter building. Some of the largest scrap, including railroad tankers and boxcars, is dismantled with a cutting torch before being stockpiled. Some of the scrap steel, including I-beams, pipes, and steel plates are stockpiled just east of the old smelter building.

Buildings: Building materials sampled included fugitive dust, porous materials, wipe samples, and indoor air samples. Results of analysis of TCLP extracts from porous building materials exceeded regulatory limits for lead and cadmium for some samples. Asbestos was also found in insulating materials in one building. Heavy metals, PCBs and cyanide were detected in wire samples from several buildings.

Ground water: Ground waster analyses performed for the Jacks Creek Site included analysis of water from residential sources, shallow wells, deep wells, and of the perched leachate from beneath the Ball Mill Tailings Pile. Low concentrations of some metals were detected in residential water samples. Shallow wells had elevated levels of total metals including aluminum, antimony, arsenic, beryllium, chromium, cobalt, copper, iron, lead, manganese, nickel, vanadium, and zonc. Some shallow wells also had slightly elevated levels of dissolved metals including cadmium, cobalt, copper, iron, lead, manganese, nickel, and selenium. In addition, elevated levels of copper, lead, manganese, and zinc were found in the dissolved samples from some deep wells onsite. Very high concentrations of heavy metals were found in the perched leachate from beneath the Ball Mill Tailings Pile. Lead was detected as high as 91,500 g/L in the total samples, while the dissolved fraction contained 630 g/L of lead. In the most recent round of ground water sampling, which occurred in the Spring of 1996, no containment was detected above the Maximum Containment Level (MCL) in any of the wells sampled. The MCL is the maximum permissible level for a contaminant in water which is delivered to any user of a public water system.

Jacks Creek: Media analyzed from Jacks Creek included surface water, sediments, and fish tissue. All surface water samples from Jacks Creek were relatively free of organic and inorganic contamination. Sediments collected from Jacks Creek, its tributaries, and flood plains were found to contain heavy metals, such as copper, lead and zinc, PCBs, and some poly-aromatic hydrocarbons (PAHs). PCBs and pesticides, such as dieldrin were detected in sediments from Jacks Creek adjacent to the Site and at much lower concentrations downstream. Fish tissue analysis for fish from Jacks Creek showed elevated levels of metals both in fish fillets and in whole-body samples. PCB concentrations increased in samples from fish collected adjacent to the Site as compared to samples from fish collected upstream and downstream.

II. SUMMARY OF SITE RISKS

Following the Remedial Investigation, analyses were conducted to estimate the human health and environmental hazards that could result if contamination at the Site was not remediated. These analyses are commonly referred to as a Risk Assessment and identify existing and future risks that could occur if conditions at the Site do not change. The objectives of the Risk Assessment are to define the actual or potential risks to human health and the environment resulting from the presence of contamination in various media and to provide the basis for determining appropriate remedial measures for these media in the Feasibilty Study.

The Risk Assessment for the Site is complex because of the variety of contaminants, the number of contaminated media, the potential for contaminant migration, and the number and location of potentially exposed populations. The Baseline Human Health Risk Assessment (BLRA) evaluated human health risks and the Ecological Risk Assessment (ERA) evaluated environmental impacts from the Site.

Baseline Human Health Risk Assessment: The BLRA assesses the toxicity, or degree of hazard, posed by contaminants related to the Site and involves describing the routes by which humans could come into contact with these substances. The BLRA is composed of the following four steps:

1. Identification of Chemicals of Potential Concern
2. Exposure Assessment

3. Toxicity Evaluation
4. Risk Characterization

The purpose of the first step, identification of chemicals of potential concern, is to identify the contaminants at the Site to which exposure may occur. The exposure assessment step identifies exposure routes and population characteristics for receptors exposed to contaminants at the Site, or contaminants migrating from the Site. The purpose of the toxicity evaluation step is to identify which contaminants present at the Site pose a risk to human health and at what level such exposure may be harmful. The final step, risk characterization, combines the information of the previous three steps to quantitatively and qualitatively evaluate site-specific risks. Separate calculations are made for those substances that can cause cancer (carcinogenic), and for those that can cause non-carcinogenic, but adverse, health effects. For example, a compound could have an adverse impact on liver or kidney function with causing cancer.

In general, a number of heavy metals, PCBs, and dioxin are the contaminants of concern at the Site. Volatile organics and pesticides were also detected in various media, however, the concentrations of these constituents were only slightly elevated above background concentrations. Based on the results of the Remedial Investigation, the primary contaminants associated with potential human health risk at the Site include:

- inorganic elements (aluminum, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc);
- pesticides (alpha and gamma Chlordane); and
- dioxins and PCBs.

Some of the contaminants present onsite are greater threat to human health than others. Four of the most significant contaminants at this Site, in terms of human health impacts, are copper, lead, mercury and PCBs. A brief toxicity profile on each of these substances is included below.

Copper is a reddish-brown metal which occurs free or in ores. It is insoluble in water but soluble in acid. Metallic copper is used as a conductor of electricity and in all gauges of wire for circuitry, soil, high conductivity tubes, etc. Copper is used in many important alloys such as brass and bronze. Copper is ised in insecticides, fungicides, catalysts, analytical reagents and paints. Acute exposure to copper salts may cause eye and skin irritation. Acute industrial exposure to copper may occur as a result of fumes generated during welding copper-containing metals. This type of exposure may cause upper respiratory tract and stomach irritation. Chronic exposure to copper rarely occurs except in individuals with Wilson's disease. This is a genetic condition where abnormal amounts of copper are absorbed and stored by the body. Chronic exposure to copper may result in anemia. Copper is not classifiable as to human carcinogenicity.

Lead is heavy metal that exists in one of three oxidation states, 0, +2, and +4. Occupational exposure to lead dust and fumes can occur during mining, refining, smelting, and welding. Children exhibiting pica (placing of non-food items in the mouth) as well as children exhibiting normal hand-mouth activities exposed to lead based chips, lead bearing dusts on environmental surfaces, or to soils contaminated with lead may be exposed to lead hazards that may result in elevated blood lead levels. Some of these effects, particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development, may occur at blood lead levels so low as to be essentially without a threshold. Developmental toxicity having effects upon growth, IQ, and hearing may occur at blood lead levels at or below 10 ug/dL. Lead has been classified as a Group B2 probable human carcinogen. Oral exposure to lead salts primarily phosphates and acetates, has caused kidney tumors in laboratory animals.

Mercury is a silver-white, heavy liquid metal that is slightly volatile at ambient temperatures. Mercury can occur in the environment in either the organic (usually methyl) or inorganic (metallic) form. Mercury compounds are used as preservatives, disinfects, fungicides, and germicides. Additionally, mercury is used in the plating, dyeing, textile and pharmaceutical industries. In humans, prenatal exposure to methyl mercury has been associated with brain damage. Other major target organs for organic mercury compounds in humans are the central and peripheral nervous systems and the kidney. In animals, toxicity effects also occur in the liver, heart, gonads, pancreas, and gastrointestinal tract. Experimental studies involving laboratory animals indicate that both organic and inorganic forms of mercury are toxic to embryos.

Polychlorinated biphenyls (PCBs) are complex mixtures of the products of the chlorination of biphenyl. The mixtures contain isomers of chlorobiphenyls with different chlorine content. PCBs may contain other chlorinated mixtures, e.g., chlorinated naphthalenes and chlorinated dibenzofurans. PCBs are stable and nonflammable. They are used chiefly in

insulation for electric cables and wires. PCBs are persistent in the environment and bioaccumulate in food chains, with possible adverse effects on animals and man. Prolonged skin contact may cause the formation of chloracne which is characterized by blackheads, fat-containing cysts and pustules. Irritation of eyes, nose and throat may also occur. Systemic toxic effects are dependent upon the degree of chlorination of the biphenyls. Short and long-term exposure may cause liver damage. PCBs may cause embryo toxicity leading to stillbirth. Some PCBs are carcinogenic in animals. The EPA has classified PCBs as Group B2 probable human carcinogens. Oral exposure to PCBs has been shown to cause liver tumors in laboratory animals.

The purpose of the exposure assessment is to evaluate the potential for human exposure to hazardous chemicals present at the Site or mitigating from the Site. In the exposure assessment, potentially exposed individuals were identified and the magnitude or degree of exposure was estimated. The following groups of individuals could be exposed to Site contaminants either currently and/or in the future and were evaluated in the BLRA:

- Current or future scrap yard employees or nearby residents accidentally eating or breathing contaminated dusts from onsite soils, buildings or waste piles;
- Adults or children eating contaminated fish from Jacks Creek;
- Trespassers coming in direct contact with contaminated soils or wastes.

Individuals could potentially be exposed to Site contaminants in various ways. The exposure routes evaluated in the risk assessment include:

- accidently breathing or eating contaminated dust from the onsite soils;
- placing objects such as hands contaminated with Site soil and sediment in the mouth; and
- eating fish from the river.

Different combinations of the above routes of exposure were considered for various group of individuals that could be exposed to Site contaminants. Table 1 shows the most significant risk scenarios and summarizes the total risk levels from all appropriate exposure routes calculated for each group of individuals. The total risk levels are all marked with an asterisk (*) because they also include a number of less significant risk scenarios that are not listed in Table 1. As Table 1 indicates, a number of these groups of individuals could be exposed to unacceptable health risks if Site contamination is not addressed and no restrictions are placed on future use of the Site. Actual or threatened releases of hazardous substances from this Site, if not addressed by EPA's selected remedy may present a current or potential threat to human health or welfare.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes acceptable levels of carcingenic risk for Superfund sites ranging from one excess cancer case per 10,000 epople exposed to one excess cancer case per one million people exposed. This translates to a risk range of between one in 10,000 and one in one million additional cancer cases in an exposed population. Expressed as scientific notation, this risk range is between 1.0E-04 and 1.0E-06. Remedial action is warranted at a site when the calculated cancer risk level exceeds 1.0E-04. However, since EPA's cleanup goal is generally to reduce the risk to 1.0E-06 or less, EPA also may take action where risk is between 1.0E-04 and 1.0E-06.

The NCP also states that sites should not pose a health threat due to a non-carcinogenic, but otherwise hazardous, chemicals. EPA defines a non-carcinogenic threat by the ratio of the contaminant concentration that a person may encounter at the Site to the established safe concentration. If the ratio, which is called the Hazard Index (HI), exceeds one (1.0), there may be concern for the potential non-carcinogenic health effects associated with exposure to that chemical. The HI identifies the potential for the most sensitive individuals to be adversely affected by the non-carcinogenic effects of chemicals. As a rule, the greater the value of the HI above 1.0, the greater the level of concern. This Site certainly presents a non-carcinogenic risk to human health with numerous HI's well above the 1.0 threshold from a number of different exposure routes.

Table 1
Human Health Risks at the Site

Group of Individuals	Cancer Risk	Hazard Index
Scrap yard employee ingesting onsite soils	2E-03	6.2
Scrap yard employee ingesting dust from the smelter building	5E-05	12.7
Scrap yard employee ingesting Ball Mill Tailings Pile	8E-05	1.4
Scrap yard employee having sking contact with contaminated soils	7E-04	0.03
*Total Risk to Scrap Yard Employee	3E-03	26
Ingesting onsite soils (Child resident)	5E-05	0.7
Ingesting onsite soils (Adult resident)	3E-05	0.3
Eating fish (Child resident)	4E-04	34
Eating fish (Adult resident)	9E-04	14
Skin contact with soils (Adult resident)	2E-05	0.01
Skin contact with soils (Child resident)	7E-05	0.01
*Total Risk to resident (Adult)	9.5E-04	19
*Total Risk to resident (Child)	5.2E-04	58

Ecological Risk Assessment: EPA also evaluated the ecological risks associated with the Site. A number of media found on the Site pose an environmental risk based on ecological assessments performed during the RI. Concentrations of some chemicals including beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, alpha-chlordane, gamma-chlordane, and PCBs exceeded relevant toxicity criteria in the surface water and sediments of onsite tributaries or in Jacks Creek. These contaminants are also found in the onsite soils and/or the waste piles, which may be serving as sources for the contamination found in the sediments of Jacks Creek. Contaminants at the Site have the potential to migrate offsite in fugitive dust, ground water, or via surface runoff.

Environmental receptors of the potential hazards posed by the Site include: onsite terrestrial vegetation, herbivores feeding on onsite vegatation, the aquatic biota (including the fish) of Jacks Creek, especially in the vicinity of the Site and its onsite tributaries, and transient wildfire, such as birds, that occasionally use these habitats. Environmental receptors would also include resident wildlife, including birds, that would bathe in and drink from contaminated ponded water on the Site, ingest contaminated grit, and feed on contaminated earthworms and vegetation. High levels of the organic contaminants are having an impact on the benthic invetebrates living in the sediments near the Site. Elevated levels of these same compounds in surface soils are impacting the terrestrial vegetation throughout the Site. Large areas of the Site are completely devoid of vegetation. in other locations, vegetational growth appears stunted, yellowed and diseased.

III. DESCRIPTION OF ALTERNATIVES

The Feasibility Study (FS) discusses a total of seven alternatives evaluated for the Site. The Addendum Feasibility Study (AFS), which was written by Parsons for the PRP Group, discusses a total of eleven other cleanup alternatives for the Site. This Record of Decision includes a "No Action" alternative required by the NCP and five alternatives that are protective of human health and the environment, achieve state and federal regulatory requirements, and best achieve the cleanup goals for the Site. Three of these alternatives are from the FS, and two othere are from the AFS. The FS and the AFS may be found in the Administrative Record for the Site.

Capital costs consist of direct (Construction) and indirect (non-construction and overhead) costs. Direct costs include expenditures for the equipment, labor, and materials necessary to install remedial actions. Operations and Maintenance costs are costs resulting from activities conducted at a site after a remedial action to ensure that the cleanup is functioning properly. Present worth costs are sued to evaluate expenditures that occur over different time periods by discounting all future costs to a common base year, ususally the current year. Time to implement is the estimated implementation time to construct a remedial action.

Alternative 1:	No Action
Capital Cost:	$0
Operation and Maintenance (O&M) Cost	$0
Present Worth Cost:	$0
Time to Implement:	0

The NCP requires that EPA consider a "No Action" alternative for every Superfund site to establish a baseline or reference point against which each of the remedial action alternatives are compared. In the event that the other identified alternatives do no offer substantial benefits, the No Action alternative may be considered a feasible approach. This alternative leaves the Site undisturbed and all current and potential future risks would remain.

Alternative 2:	Consolidated of Contaminated Material and Capping
Capital Cost:	$8,800,000
O&M Cost:	$ 82,000
Total Present Worth Cost:	$9,800,000
Time Implement:	9 to 12 months

This alternative is based on Alternative 2-A2 in the AFS and includes the following components:

Consolidation: Material in the two wastes piles would be flattened and consolidated with the following: soils in the flood plainn exceeding 500 ppm lead; sediments from Jack Creek exceeding 500 ppm lead; site soils outside the floodplain exceeding 3,000 ppm lead; and the battery casings remaining onsite. The consolidation area would be located in a portion of the

Site which is already contaminated with site-related contaminants. Buildings in area requiring excavation or to be capped would be demolished and the building debris would also be consolidated with the waste pile materials.

Multi-layer Cap: The flattened waste piles and consolidated materials would be first covered with a two-inch layer of cruched limestone and then covered with a multi-layer cap consisting of a barrier layer, a drainage layer and a seeded topsoil layer. The barrier layer would be composed of a high-density polyethylene (HDPE) geomembrane. A six-inch sand drainage layer would be placed on top of the geomembrane. A one-foot layer of protective soils, and six-inches of topsoil would be placed on top of the drainage layer. The topsoil layer would then be seeded in order to vegetate the entire consolidation area.

Backfilling: Excavated areas would be restored with clean fill to the original grade and then seeded in order to revegetate all excavated areas except for the scrap yard. Stormwater controls: Stormwater controls would be installed to divert stormwater away from the entire capped area.

Maintenance: Long-term maintenance of the multi-layer cap and the stormwater controls would be conducted to ensure proper functioning of these components.

Alternative 3:	Excavation and Offsite Treatment and Disposal of Soils Exceeding 40,000 ppm lead; Consolidation and Capping of Remaining Material above 1,000 ppm lead
Capital Cost:	$10,335,000
O&M Cost	$164,000
Total Present Worth Cost	$12,500,000
Time to Implement	9 - 12 months

This alternative was developed by EPA after completion of the FS and the AFS. It includes the following components:

Offsite Treatment: Soils with lead concentrations above 40,000 ppm, which are the principal threat wastes, would be excavated and treated at an offsite hazardous waste treatment facility using a chemical stabilization process. An estimate of the volume of principal threat wastes is 14,500 tons.

Consolidation: Site waste pile materials and soils between 1,000 and 40,000 ppm lead would be consolidated in the unused portion of the Site in an area already contaminated with site-related contaminants. This consolidation includes soils located within the onsite lagoons which are often described as lagoon sludges. Sediment from depositional areas of Jacks Creek exceeding 110 ppm lead in the immediate vicinity of the Site would be removed by vacuum dredging and also consolidated with the contaminated soils and waste pile material. The consolidation pile would be located outside the floodplain area of the Site, and would be on the portion of the Site that is not currently used.

Multi-layer Cap: The consolidated waste pile materials, soils, and sediments would be covered with a multi-layer cap as described in Alternative 2 above.

Backfilling & Wetlands Replacement: Excavated areas would be restored with clean fill to the original grade on the entire Site and the unused portion of the Site would be revegetated. Existing onsite wetlands which are destroyed during the excavation activities will be replaced in an onsite location.

Soil Cover: Onsite areas in the floodplain that are no wooded and have lead levels below 1,000 ppm lead would also be covered with 18 inches of clean soil and seeded. The total area of this soil cover is estimated to be approximately four acres in size.

Buildings: Buildings onsite that are structurally unsound would be demolished. Debris from demolition would be disposed offsite. The abandoned buildings remaining onsite would be secured by installation of doors and locks.

Drums/Vat Disposal: The drums and the vat would be collected and then transported offsite for proper disposal.

Institutional Controls: Deed restrictions would be placed on the Site to restrict use of the capped area, limit use of the other areas of the Site to industrial activities, and prevent use of ground water from the Site.

Fencing: An eight-foot high fence would be constructed on the northern side of the active scrap yard in order to completely fence the Site on all sides.

Storm water controls: Strom water controls would be installed to divert stormwater away from the capped area.

Monitoring: Long-term monitoring of ground and surface water, as well as the fish and benthos in Jacks Creek, would also be conducted.

Fish Consumption Advisories: Fish consumption advisories would be posted along Jacks Creek near the Site.

Maintenance: Long-term maintenance of the multi-layer cap, soil cover, stormwater controls, and fence would be conducted to ensure proper functioning of these components.
Five-year Reviews: Because contamination will remain onsite at concentrations that could pose a threat to human health and the environment, a review of Site conditions would be require every five years to ensure that the remedy is adequately protecting human health and the environment.

Alternative 4:	Onsite Chemical Fixation of Material with over 10,000 ppm lead; Consolidation and Capping of Treated and Untreated Material; and Institutional Controls
Capital Cost:	$26,000,000
O&M Cost:	$ 177,000
Total Present Worth Cost:	$28,000,000
Time to Implement:	24 to 28 months

This alternative is based upon Alternative 3A in the AFS with slight modifications by EPA. It includes the following components:

Onsite Treatment: Soils and waste material with lead concentrations above 10,000 ppm would be excavated and treated onsite using a chemical fixation process. The estimated volume of soil and waste requiring treatment is approximately 240,000 tons.

Consolidation: Treated material would be consolidated with soils from the Site with lead concentrations between 1,000 and 10,000 ppm. Sediments from depositional areas of Jacks Creek exceeding 110 ppm of lead would also be consolidated with the treated material.

The remaining features includingthe multi-layer cap over the consolidated material backfilling buildings, institutional controls, fencing, stromwater controls, monitoring, fishing advisories, maintenance, and five-year reviews would be the same as those described for Alternative 3.

Alternative 5:	Onsite Chemical Fixation of Material with over 1,000 ppm lead; Consolidation and Capping of Treated Material and Sediment; and Institutional Controls
Capital Cost:	$36,000,000
Annual O&M Cost:	$ 165,000
Total Present Worth Cost:	$38,000,000
Time to Implement:	24 to 30 months

This alternative is based on Alternative 4 in the FS and includes the following components:

Onsite Treatment: Soils and waste material having lead concentrations above 1,000 ppm would be excavated and treated onsite using a chemical fixation process. The estimated volume of soils and waste requiring treatment is 670,000 tons.

Consolidation: The treated material would be consolidated in the unused portion of the Site and covered with a soil cover.

The remaining features of this alternative including the deed restrictions, fence construction, building demolition advisories, maintenance, five-year reviews and long-term monitoring shall be the same as those described for Alternative 3.

Alternative 6:	Onsite Chemical Fixation of Material with over 1,000 ppm lead; Offsite Disposal of Treated Material and Sediment

Capital Cost:	$111,000,000
Annual O&M Cost:	$165,000
Total Present Worth Cost:	$113,000,000
Time To Implement:	24 to 28 months

This alternative is based on Alternative 5 in the FS and includes the following components:

Onsite Treatment: Soils and waste material having lead concentrations above 1,000 ppm would be excavated and treated onsite using a chemical fixation process. The estimated volume of soils and waste requiring treatment is 670,000 tons.

Offsite Disposal: The treated material would be disposed offsite at a sold waste/municipal landfill.

The remaining features of this alternative including the deed restrictions, fence construction, building demolition, fishing advisories, and long-term monitoring would be the same as those described for Alternative 3.

IV. COMPARATIVE EVALUATION OF ALTERNATIVES

Each of the six (6) remedial alternatives summarized in this ROD has been evaluated with respect to the nine(9) evaluation criteria set forth in the NCP, 40 C.F.R. Section 300.430(e)(9). These nine criteria can be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. A description of the evaluation criteria is presented below:

Threshold Criteria:

1. Overall Protection of Human Health and the Environmental addresses whether a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether a remedy will meet all of the applicable, or relevant and appropriate requirements of environmental statutes.

Primary Balancing Criteria:

3. Long-term Effectiveness refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals are achieved.
4. Reduction of Toxicity, Mobility, or Volume through Treatment addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume of containments.
5. Short-term Effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posted during the construction and implementation period until cleanup goals are achieved.
6. Implementability addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
7. Cost includes estimated capital, operation and maintenance costs, and present worth costs.

Modifying Criteria:

8. State Acceptance indicates whether, based on its review of backup documents and the ROD, the State concurs with, opposes, or has no comment on the Selected Alternative.
9. Community Acceptance will be assessed in the Record of Decision following a review of public comments received on the Proposed Plan and supporting documents included in the Administrative Record.

1. Overall Protection of Human Health and the Environment

A primary requirement of CERCLA is that the selected remedial alternative be protective of human health and the environment. A remedy is protective if it reduces current and potential risks to human health and the environment to acceptable levels. Alternative 1 (No Action) would not effectively reduce the risk to human health and the environment at the Site. This alternative would no adequately reduce exposure to containment present at the Site and would not control migration of containments from the Site. Both current and potential future users of the Site would be expected to unacceptable human health risks as indicated previously in Table 1 of this ROD. In addition, adverse ecological impacts would continue unabated at the Site. Because this alternative does not meet the threshold criteria of protection of human health and the

environment, it will not be considered further in this analysis.

The remaining alternatives are all protective of human health and the environment. alternative 2 reduces the potential for exposure to Site contaminants by consolidating and capping the contaminated material. alternatives 3-5 also reduce the potential for exposure by consolidating and capping the contamination. These alternatives also require that varying amounts of contamination be treated prior to capping which further reduces the potential for exposure. Alternative 3 uses treatment in an efficient manner by limiting treatment to the principal threat soils. Alternative 6 reduces the potential for exposure by treating and removing all the contaminated material from the Site.

2. Compliance with Acceptance or Relevant and Appropriate Requirements (ARARS) 1

Any cleanup alternative considered by EPA must comply with all applicable or relevant

1 Under Section 121(d) of CERCLA, 42 U.S.C. º 9621 (d), and EPA guidance, remedial actions at CERCLA sites must attain legally applicable or relevant and appropriate federal and promulgated state environmental standards, requirements, criteria and limitations which are collectively referred to as "ARARs", unless such ARARs are waived under Section 121(d)(4) of CERCLA, 42 U.S.C. º 9621(d)(4). and appropriate federal and state environmental requirements. Applicable requirements are those substantive environmental standards, requirements, criteria, or limitations promulgated under federal or state law that are legally applicable to the remedial action to be implemented at the Site. Relevant and appropriate requirements while not being directly applicable, address problems or situations sufficiently similar to those encountered at the Site that their use is well-suited to the particular site. Alternative 2, 3, 4, 5 and 6 would comply with the following ARARs as appropriate:

Chemical-Specific ARARs

Ground Water: Under the implementing regulations of the Federal Safe Drinking Water Act, 40 C.F.R. ºº 141.61 and 141.62, standards for acceptable concentrations of contaminants in drinking water, called Maximum Contaminant Levels (MCLs), are established for public water supplies. The long-term monitoring program for alternatives 2, 3, 4, 5 and 6 includes monitoring private drinking water wells that could be potentially impacted by migration of contaminated ground water from the Site.

Soil/Sediment: The Commonwealth of Pennsylvania has identified Act 2 as an ARAR, and regulations issued pursuant to this Act establish a cleanup level of 1,000 ppm lead for this Site.

Surface Water: Water quality standards, promulgated pursuant to the Pennsylvania Clean Streams Law, have been established for acceptable concentrations of contaminants in State waters and are set forth in 25 pa. Code Chapter 93.1, 93.2, 93.3, 93.4, 93.7, 93.8a. the surface water regulations in 25 Pa. Code Chapter 250.406(c) established the standards for environmental remediations in Pennsylvania. the long-term monitoring program for Alternatives 2, 3, 4, 5 and 6 include monitoring of surface water at the Site, including monitoring Jacks Creek, to ensure that surface water is not adversely impacted by migration of contaminants from the Site.

Action-Specific ARARs

Multilayer Cap and Sting Requirements: 25 Pa. Code Chapter 264 regarding the closure of landfills are relevant and appropriate to the covering or capping of the landfilled industrial waste materials in Alternatives 2, 3, 4 and 5. Relevant provisions include 25 Pa. Code ºº 264.11(a), 264.117(e), 264.302(a)(6) and 264.310(1), (4), (5) and (6)(I), (v), and (vi). The requirements of 25 Pa. Code 269.22, 23, 25, and 42 are relevant and appropriate with respect to the siting of the consolidation area.

Liner: 25 Pa. Code º 264.302(a)(1)-(5), to the extent that it concerns requirements for liners, has been identified as a relevant and appropriate regulation. However, these requirements are being waived pursuant to the equivelent standard of performance waiver set forth in Section 121(d)(4)(D) of CERCLA, 42 U.S.C. º 121(d)(4)(D). The installation of the limestone blanket beneath the cap and the existence of Site-specific conditions, such as the existence of a sub-surface clay layer and the depth of the ground water, provide an equivalent standard of performance with respect to the liner requirements.

Excavation: Erosion control set forth in 25 Pa. Code Sections 102.1-5, 102.11-13, 102.21-24, are applicable to earth-moving activities associated with the multi-layer cap to be

installed in Alternatives 2, 3, 4 and 5. Storm water management measures in 32 p.S. Sections 680.11 and 680.13 are applicable to eath-moving activities during the remdiation. In addtion, dust suppression is required under 25 Pa. Code Sections 123.1 and 123.2 for these earth-moving activities.

Hazardous Waste Generation: Alternatives 3,4,5 and 6 may result in the generation of wastes that would be regulated under current hazardous wste regulations. Any hazardous waste generated must be handled consistent with the requirements of 25 Pa. Code Part 262.10-13 262.20, 262.22, 262.23, 262.30, 262.33, 262.34, 262.40-43, 262.46. With respect to transporting of hazardous wastes, it must be done consistent with 25 Pa. Code Part 263.10, 263.11, 263.13, and 263.20-22. Also with respect to storage of generated hazardous wastes under Alternatives 4 and 5, 25 Pa. Code ºº 264.171-178, 264.179(3), and 264.190-199 are relevant and appropriate.

3. Reduction of Toxicity, Mobility, or Volume through Treatment

Section 121(b) of CERCLA, 42 U.S.C. º 9621(b), establishes a preference for remedial actions which include treatment that permanently and significantly reduces the toxicity, mobility, or volume of contaminants. Alternatives 2 does not reduce the toxicity, mobility or volume through treatment. Alternative 3 entails "hot spot" treatment of highly contaminated waste through offsite stabilization, so a reduction in toxicity, mobility and volume of the onsite contaminants would occur. Alternatives 4, 5 and 6 treat larger volumes of waste and contaminated soils and, therefore, achieve increasing reductions in the toxicity and mobility of Site contaminants. The chemical fixation process slightly increases the volume of a waste during the treatment process. Therefore, both Alternative 4 and 5 would increas the volume of waste onsite.

4. Implementability

This criterion is associated with implementing the cleanup technologies associated with each alternative, including the ability and time necessary to obtain required permits and approvals, the availability of services and materials, and the reliability and effectiveness of monitoring. The installation of a multi-layer cap in Alternatives 2, 3, 4, 5 and 6 utilizes well-known construction methods. Necessary services and materials are readily available.

The chemical fixation technology used in Alternatives 4, 5 and 6 is more complicated to implement than the multi-layer cap alone. Additional sampling and bench scale laboratory treatability studies would be performed during the remedial design to determine the type and amount of reagent required to adequately stablize the waste material. Because the wastes were deposited at various times over many years, and because of their different characteristics. chemical fixation may require the use of a variety of binding materials specific to each type of waste.

Excavation of the highly contaminated waste described in Alternative 3 is a straightforward process. As with the other alternatives, additional sampling and waste characterization will be necessary to determine the location of concentrated wastes to be excavated and the appropriate landfill(s) for disposal. Because of the volume of waste involved, transportation costs could increase if appropriate landfill facilities with capacity for the waste can only be located at a significantly distance from the Site.

5. Short-Term Effectiveness

Alternatives 2, 3, 4, 5 and 6 could pose an increased short-term health risk to onsite construction workers and/or trespassers during earth-moving activities to construct the multi-layer cap. These activities have the potential to release inorganic contaminants that may be present in the soil or waste material. Alternative 4, 5 and 6 have potential for somewhat higher short-term health risks because the onsite chemical fixation process requires mixing contaminated waste with the binding agents and a greater release of contaminants could occur. In all cases, however, these short-term risks would be minimized using standard safety measures.

6. Long-term Effectiveness and Permanence

Alternatives 2, 3, 4 and 5 provide a permanent and effective long-term remedy by requiring regular and continuing maintenance of the multi-layer cap. The construction of the impermeable cap would eliminate the risk associated with the direct contact with contaminants at the Site and would reduce mobility of ground water contaminants. The stormwater controls should reduce the amount of erosion of site-related contaminants into Jacks Creek. The degree of long-term effectiveness and permanence increases with Alternatives 3, 4, 5 and 6. Under Alternative 3, the most highly contaminated soils would be removed from the Site and would not be capped onsite. By immobilizing the conatminants through treatment, Alternatives 4 and 5

rely less on continued maintenance of the multi-layer cap to achieve long-term effectiveness and permanence. Similarly, Alternative 6 completely removes the soils and wastes from the Site, thereby eliminating the possibly of any future risks at the Site from these wastes and further increasing the long-term effectiveness and permanence. The long-term monitoring program would evaluate the ongoing effectiveness and permanence of all of the alternatives.

7. Cost

Evaluation of costs of each alternative generally includes the calculation of direct and indirect capital costs qand the O&M costs, both calculated on a present worth basis. The total present worth cost of Alternatives 2, 3, 4, 5 and 6 has been calculated for comparative purposes and is presented in Table 2 below. Direct capital costs include costs of construction, equipment, building and services, and waste disposal. Indirect capital costs include engineering expenses, start-up and shutdown, and contingency allowances. O&M costs include labor and material; chemicals, energy, and fuel; administrative costs and purchased services; monitoring costs; costs for periodic site review (every five years); and insurance, taxes, and license costs. For cost estimation purposes, a period of 30 years has been used for O&M. In reality, maintenance of a multi-layer cap would be expected to continue indefinately. The actual cost for each alternative is expected to be in a range from 50 percent (50%) highere than the costs estimated to 30 percent (30%) lowere than the costs estimated. Using these ranges, a $10 million cost estimate for an entire cleanup in a ROD could vary from $ 7-15 million by the time the cleanup is actually completed.

Table 2
Estimated Cost of Alternatives

Alternative	Total Present Worth Cost
2	$9,800,000
3	$12,500,000
4	$28,000,000
5	$38,000,000
6	$113,000,000

8. State Acceptance

The Commonwealth of Pennsylvania has concurred with this ROD. PADEP has reviewed all the supporting documents and provided support to EPA throughout the entire Superfund process at this Site.

9. Community Acceptance

Community acceptance of the preferred alternative is discussed in Section VII, the Responsiveness Summary Section of this ROD. In general, the community is supportive of EPA's selected remedy, and would like to see it implemented as soon as practicable.

V. DESCRIPTION OF THE SELCTED REMEDY

Based on the comparison of the nine evaluation criteria for each of the alternatives in this Proposed Plan, EPA's preferred alternative is Alternative 3: Excavation and Offsite Disposal of Material with over 40,000 ppm lead; Consolidation and Capping of Remaining Material above 1,000 ppm lead. Soils with lead concentrations above 40,000 ppm, which are the principal threat wastes, will be excavated and treated at an offsite hazardous waste treatment facility using a chemical stabilization process. Site waste pile materials and soils having lead concentrations between 1,000 and 40,000 will be consolidated in the unused portion of the Site. Sediment from depositional areas of Jacks Creek in the immediate vicinity of the Site exceeding 110 ppm lead will be removed by vacuum dredging and also consolidated with the contaminated soils and waste pile materials. The consolidation area will be covered with multi-layer cap.

Excavated areas will be restored with clean fill to the original grade and revegetated. Existing wetlands that are destroyed during the excavation will be replaced with onsite wetlands areas of equivalent size. Onsite areas in the floodplain that are not wooded and have lead levels below 1,000 ppm lead will also be covered with 18 inches of clean soil and seeded Buildings onsite that are structurally unsound will be demolished. Demolition debris will be disposed offsite. The abandoned buildings remaining onsite will be properly secured with locks and doors. Onsite drums will be transported offsite for disposal. An eight-foot fence will be constructed on the northern side of the active scrap yard. Storm water controls will be installed to divert storm water from the capped area. Deed restrictions will be placed on a portion of the Site to restrict use of the capped area. Fish consumption advisories will be posted along Jacks Creek near the Site. Long-term monitoring of ground and surface water, as well as the fish and benthos in Jacks Creek, will also be conducted. Long-term maintenance of the multi-layer cap, soil cover, strom water controls, and fence will also be conducted to ensure proper functioning of the constructed remedy.

Alternative 3 meets the threshold criteria of overall protection to human health and the environment and compliance with ARARs. In considering the balancing criteria, EPA believes Alternative 3 can be readily implemented, achieves long-term effectiveness and permanence at a reasonable cost, minimizes the short-term impacts, and effectively reduces the toxicity, mobility and volume of Site contaminants through both engineering controls and treatment. Alternative 3 is the most effective of all the alternatives considered in the ROD.

Performance Standards for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives using the nine criteria, and public comments, EPA has determined that Alternative 3

is the most appropriate remedy for this Site. Each of the components of the selected remedy and the required performance standard(s) for that component are listed below:

A. Multi-layer Cap Performance Standards

The multi-layer cap shall achieve the following:

1. The multi-layer cap shall cover the entire consolidation area that is created from the relocation of the waste piles, contaminated soils and sediments. The exact size and location of the consolidation area shall be determined during the Remedial Design.

2. The multi-layer cap shall be designed to adequately protect Site users, including scrap yard employees, from being exposed to site contaminants that pose an unacceptable risk to human health.

3. The multi-layer cap shall be designed to have a permeability of 10-7 cm/sec or less in order to minimize infiltration of water through the waste and soils and into the ground water.

4. The multi-layer cap shall be designed, constructed and maintained in accordance with the relevant provision of 25 Pa. Code °° 264.117(a), 264.117(e), 264.302(a)(6) and 264.310(1), (4), (5) and (6)(I), (v), and (vi).

5. the multi-layer shall be designed and constructed to function with minimum maintenance, to minimize water and air erosion of the cover into surface water, and to accommodated settling so that the integrity of the cover is maintained.

6. A two-inch layer of crushed limestone shall be placed over the entire consolidation area, prior- to the placement of the multi-layer cap.

7. The multi-layer cap shall consist of the following components: a barrier layer consisting of a HDPE geomembrane, a six-inch sand drainage layer, a one-foot layer of protective soils, and a six-inch layer of topsoil.

8. The multi-layer cap and the backfilled areas of the Site shall be revegetated and the vegetation maintained in such a way as to provide habitat for indigenous and migratory terrestrial resources to the maximum extent practicable. Portions of the existing scrap yard which are excavated shall be backfilled but not revegetated. The exact type of seed used in revegetating the excavated areas shall be determined during Remedial Design.

B. Soil Excavation Performance Standards

1. All soils that exceed the terrestrial cleanup level of 1,000 ppm lead shall be performed during the Remedial Design to determine the full extent of contamination. Sampling and Analysis shall also be perfomed after excavation has been completed to confirm that cleanup levels set forth in the performance standards have been achieved.

2. The excavation in the active scrap yard shall be performed in a manner which disrupts the ongoing scrap yard activities as little as possible.

C. Transportation and Offsite Disposal of Highly-Contaminated Soils

1. Transportation of hazardous wastes from the Site shall be performed in accordance with 25 Pa. Code Part 263.10, 263.11, 263.13, and 263.20-22.

2. Wastes shall be disposed of in accordance with all the applicable statutes and regulations including, but not limited to, regulations governing offsite disposal found at 40 C.F.R. º 300.440.

D. Storm Water Control System

1. The storm water control system shall be designed and constructed in order to prevent storm water from infiltrating the multi-layer cap the the greatest practicable.

E. Fish Consumption Advisories

1. Warning signs shall be posted along Jacks Creek to warn potential fisherman against eating fish. These signs shall be properly maintained as long as the fish in Jacks Creek are found to have levels of contaminants that can cause adverse human health effects. The exact wording of these signs shall be agreed upon during the Remedial Design by PADEP and EPA.

F. Building Demolition, Decontamination and Disposal

1. Onsite buildings which are structurally unsound as to be a physical hazard to remediation workers shall be demolished as part of this component of the cleanup. The decision to demolish or secure the onsite buildings shall be made during the Remedial Design.

2. The demolition debris shall be steam cleaned and properly disposed offsite in a municipal landfill.

3. Buildings remaining onsite shall be secured with doors and locks in an appropriate manner to prevent entry by trespassers.

G. Collection and Disposal of Drums/Vat

1. The drums and the vat shall be collected and transported to an appropriate facility for disposal.

H. Vacuum Dredging of the Jacks Creek Sediments

1. Sediments from depositional areas of Jacks Creek in the immediate vicinity of the Site and containing lead of 110 ppm or greater shall be vacuum dredged and then placed in the onsite consolidation area. The exact location and extent of the vacuum dredging shall be determined during Remedial Design.

I. Soil Cover in Non-Forested Areas within the 100-year Floodplain

1. In the non-forested floodplain areas which are below 1000 ppm, a total of 18 inches of soil shall be placed on to the existing surface. This soil cover includes 12 inches of protective soils, and then 6 inches of topsoil. These areas, which are estimated to be a total of 4 acres in size, shall then be graded and seeded. The exact size and location of these areas will be determined during Remedial Design.

J. Monitoring of Surface Water, Ground Water, Sediments and Biota

1. Long-term monitoring of the ground water, and surface water of Jacks Creek shall occur once every six months after the remedy has been completed. These samples shall be evaluated by comparison to the Maximum Contaminant Levels (MCLs) for site-related contaminants.

2. Long-term monitoring of the fish, benthos, and sediments of Jacks Creek shall also occur once every six months after the remedy has been completed.

K. Backfilling Excavated Areas

1. All excavated areas outside of the scrap yard will be backfilled with clean soil to the original grade. The top four inches of the fill shall be topsoil in order to support the revegetation of all excavated areas.

L. Wetlands Replacement

1. All wetlands areas that are destroyed during the excavation of contaminated soils shall be replaced by the creation of onsite wetlands in accordance with 25 Pa. Code Part 105.20a. The exact size and location of these wetlands areas shall be determined during the Remedial Design.

M. Operation and Maintenance

1. The multi-layer cap, the fence, and the fishing advisory signs shall be properly maintained during the operation and maintenance phase of the cleanup process.

N. Institutional Controls

1. The fence shall be a chain-link fence, eight feet in height, and shall be installed on the north side of the scrap yard in order to limited site access to the greatest extent practicable. The fence shall be installed in a manner that allows access to the railroad track that is located in this portion of the site.

2. Deed restrictions shall be developed and submitted to EPA for approval. Once approved these deed restrictions shall be placed in the deed to the Site by filing said restrictions with the Recorder of Deeds of Mifflin County, PA.

3. The deed restrictions shall prohibit excavation or disturbance of any portion of the multi-layer cap.

4. The deed restictions shall prohibit the installation of new onsite wells for use for domestic purposes, including drinking water.

5. The deed restrictions shall be designed to allow for beneficial use of the property, providing that the beneficial use would not pose a risk to human health or the environment. The deed restrictions would prohibit the building of residential construction on the Site.

6. The deed restrictions shall be valid and binding in the Townships, County and the Commonwealth in which the Site is located. The continued need for these restrictions shall be re-evaluated during the five-year reviews which are conducted under CERCLA Section 121(c), 42 U.S.C. º 9621(c).

VI. STATUTORY DETERMINATIONS

The EPA's primary responsibility at Superfund sites is to implement remedial actions that are protected of human health and the environment. Section 121 of CERCLA, 42 U.S.C. º 9621, also establishes several other statutory requirements and preferences. The selected remedy must be cost effective and utilize a permanent solution to the maximum extent practicable. The selected remedial action must comply with all applicable or relevant and appropriate requirements set forth by State and Federal environmental statutes and regulations, unless a waiver is justified. Finally, CERCLA sets forth a statutory preference for remedial actions that permanently reduce the toxicity, mobility, and volume of the site-related wastes. The following sections discuss how the selected remedy meets the statutory requirements and preferences set forth in Section 121 of CERCLA.

Protection of Human Health and the Environment

The risk assessment identified future exposure to contaminated ground water as the most significant exposure pathway in terms of its potential impact on human health. The risk assessment also showed that the site has a relatively high volume (85,000 tons) of low toxicity waste. The remedial measures included in the preferred remedy shall impede further migration of waste or contaminated soils from the landfill. The selected remedy would also protect human health by eliminating direct contact with the site soils through access restrictions and placement of a multilayer cap system. The selected remedy also protects the environment by reducing contaminant migration into the unnamed stream. Additionally, implementation of this alternative is not expected to result in any adverse short-term risks or cross-media impacts

Cleanup Levels

A number of different cleanup levels have been developed for this Site. Lead is a ubiquitous contaminant at the Site, and therefore it was sued as the indicator compound for the other Site contaminants. The cleanup level for lead in the sediments of Jacks Creek, an environmentally-sensitive area, is 110 ppm. This cleanup level in the sediments is derived from a 1990 study by E.R. Long and L.G. Morgan entitled "The Potential for Biological Effects of Sediments-sorbed Contaminants Tested in the National Status and Trends Program". In the terrestrial portion of the Site, the level at which soils will be consolidated is 1,000 ppm lead. This is an industrial site so the upper portion of the 500-1000 ppm range for lead in soils was used at this Site. A cleanup goal of 1000 ppm lead is also approximately the midpoint of the protective range of 750 to 1750 ppm lead from EPA's adult lead model. This adult lead model was published in December 1996, and is entitled "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil". In addition, the commonwealth of Pennsylvania has identified the Pennsylvania Land Recycling Act as an ARAR, and regulations issued pursuant to this Act establish a cleanup of 1000 ppm lead for this Site.

The level requiring treatment in the Preferred Alternative is 40,000 ppm lead, which is two orders of magnitude above 400 ppm lead, the residential screening level. The residential screening level is a level which allows for unrestricted use and unlimited exposure. At this Site, soils containing 40,000 ppm lead or greater are considered principal threat wastes requiring treatment.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedial action will comply with all ARARs. The ARARs specific to the selected remedy are presented below. Except where specifically noted, the site-specific limitations to the following ARARs will be identified in the remedial design phase.

Chemical-Specific ARARS

Ground Water: Under the implementing regulations of the federal Safe Drinking Water Act, 40 C.F.R. °° 141.61, and 141.62, standards for acceptable concentrations of contaminants in drinking water, called Maximum Contaminant Levals (MCLs), are established for public water supplies. The long-term monitoring program for Alternative 3, includes monitoring private drinking water wells that could be potentially impacted by migration of contaminated ground water from the Site.

Soil/Sediments: The Commonwealth of Pennsylvania has identified Act 2 as an ARAR, and regulations issued pursuant to this Act establish a cleanup level of 1000 ppm lead.

Surface Water: Water quality standards, promulgated pursuant to the Pennsylvania Clean Streams Law, have been established for acceptable concentrations of contaminants in State waters and are set forth in 25 Pa. Code Chapter 93.1, 93.2, 93.3, 94.4, 93.6, 93.7, and 93.8a. The surface water regulations in 25 Pa. Code Chapter 250.406(C) established the standards for environmental remediations in Pennsylvania. The long-term monitoring program for Alternative 3 includes monitoring of surface water at the Site, including monitoring Jacks Creek, to ensure that surface water is not adversely impacted by migration of contaminants from the Site.

Action-Specific ARARs

Multi-Layer Cap and Siting Requirments: 25 Pa. Code Chapter 264 regarding the closure of landfills are relevant and appropriate to the covering or capping of the landfilled industrial waste materials in Alternatives 3. Relevant provisions include 25 Pa. Code °° 264.117(a), 264.117(e), 264.302(a)(6) and 264.310(1), (4), (5) and (6)(I), (v), and (vi). The requirements of 25 Pa. Code 269.22, 23, 25, and 42 are relevant and appropriate with respect to the siting of the consolidation area.

Liner: 25 Pa. Code ° 264.302(a)(1)-(5), to the extent that it concerns requirements for liners, has been identified as a relevant and appropriate regulation. However, these requirements are being waived pursuant to the equivalent standard of performance waiver set forth in Section 121(d)(4)(D) of CERCLA, 42 U.S.C. ° 121(d)(4)(D). The installation of the limestone blanket beneath the cap and the existence of Site-Specific conditions such as the existence of a sub-surface clay layer and the depth of the ground water, provide an equivalant standard of performance with respect to the liner requirements.

Waste Piles/Landfill: Alternative 3 requires the movement and consolidation of onsite waste piles and contaminated soils. 25 Pa. Code ° 264.251(a)(f)(g) and (n) are relevant and appropriate to this aspect of the remediation. Also 25 Pa. Code ° 264.301 (4-9), (14) and (15) are relevant and appropriate with respect to the design of the landfill.

Excavation: Erosion control measures set forth in 25 Pa. Code Sections 102.1-5, 102.11-13, 102.21-24, are applicable to earth moving activities associated with the multi-layer cap to be installed in Alternative 3. Storm water management measures in 32 P.S. Sections 680.11 and 680.13 are applicable to earth-moving activities during the remdiation. In addition, dust suppression is required under 25 Pa. Code Sections 123.1 and 123.2 for these earthmoving activities.

Hazardous Waste Generation: Alternative 3 may result in the generation of wastes that would be regulated under current hazardous waste regulations. Any hazardous waste generated must be handled consistent with the requirements of 25 Pa. Code ° 261.10-13, 262.20, 262.22, 262.23, 262.30, 262.33, 262.34, 262.40-43, 262.46. With respect to transporting of hazardous wastes, it must be done consistent with 25 Pa. Code ° 263.10, 263.11, 263.13, and 263.20-22. Also with respect to storage of generated hazardous wastes under Alternative 3, 25 Pa. Code °° 264.171-178, 264.179(3), and 264.190-199 are relevant and appropriate.

Location-Specific ARARs

Wetlands Replacement (25 Pa. Code 105.17, 105.20a, 105.46 and 105.46(a). This regulation is applicable to the replacement of wetlands areas destroyed during the excavation of contaminated soils.

Floodplain Management (25 Pa Code 106.1, 106.2, 106.23, and 106.32). This regulation is applicable to the floodplain management during onsite construction activities.

Siting (25 Pa Code 269.1, 269.22, 269.23, 269.42) These regulations are applicable with

respect to the siting of the landfill on an appropriate portion of the Site property.

To Be Considered

1. Pennsylvania's Lands Recycling Technical Manual - This document can be helpful in understanding the standards established for environmental remediations conducted in Pennsylvania.

2. Soil Erosion and Sedimentation Control Manual - This document can be used to interpret the regulations regarding erosion and sedimentation control during construction activities.

3. Design Criteria for Wetlands Replacement, Division of River and Wetlands Conservation, P.O. Box 8761, Harrisburg, PA 17105-8671. These criteria can be useful in designing a wetlands replacement project.

Cost Effectiveness

The selected remedy is cost effective because it has been determined to be the best balance between cost and protection of human health, welfare and the environment. The selected remedy has excellent short-term effectiveness proportional to its cost. The estimated capital cost for this alternative is $10,335,000 with a net present worth cost including 30 years of operation and maintenance of $12,500,000. Table 3, on the next page, list the capital costs for each component of the selected remedy. The selected remedy provides a level of protection of human health comparable to that provided by the other remedies, but at a significantly reduced cost. Although other remedies may be more effective in the long-term, the site-related risks do not justify the additional capital expenditure.

Utilization of Permanent Solutions to the Maximum Extent Practicable

The EPA has determined that the selected remedy represents the maximum extent to which permanent treatment technologies can be utilized in a cost effectivew manner for the site. Of those alternatives that are protective of human health and the environment and comply with

Components of the Selected Remedy Alternative 3	Capital Cost ($)
1. Deed Restrictions	1,000
2. Fence Construction	67,000
3. Disposal of Drums/vats	35,000
4. Demolition/Securing Buildings	422,000
5. Monitoring ground & surface water	10,000
6. Posting fish consumption advisories	10,000
7. Excavation/offsite disposal of soils>40,000 ppm lead	2,500,000
8. Consolidation of soils, wastes & sediments	1,300,000
9. Multi-layer capping of consolidation pile	2,500,000
10. Capping floodplain soils<1,000 ppm lead	220,000
11. Backfilling excavated areas & wetlands replacement	3,270,000
TOTAL CAPITAL COST	10,335,000

ARARs, the EPA has determined that the selected remedy provides the best balance in terms of short-term effectiveness; implementability; cost; reduction in toxicity, mobility, and volume; and long-term effectiveness.

The selected remedy does no offer as high a degree of long-term effectiveness as the offsite disposal of all wastes, however; it will significantly reduce the risks to human health posed by the site soils. EPA has determined that the use of more costly treatment technologies at the site are not justifiable. Because all the remedial alternatives, with the exception of Alternatives 1, offer a comparable level of protection of human health and the environment, the EPA has selected Alternative 3, which can be implemented quickly; will have little or no adverse effects on the surrounding community; and will cost considerably less than the other alternatives.

Preference for Treatment as a Principal Element

The statutory preference for remdial alternatives that employ treatment as the principal element has been met by the treatment of principal threat waste at an offsite treatment facility. Although several of the other remedies, such as Alternative 5, employ even more treatment of waste, the EPA has determined that Alternative 3, can be implemented more quickly and cost effectively than the other alternatives while still providing an adequate level of protection to human health and the environment.

Documentation of Significant Changes

The preferred alternative originally identified in the Proposed Plan is also the alternative selected in ROD. There have been no significant changes made to the selected remedy in the time period between the issuance of the Proposed Plan on February 27, 1997 and the signing of the ROD approximately six months later. However, a minor change to the selected remedy was made. The onsite wetlands areas, which are approximately one-fifth of an acre in size, will be recreated onsite as part of the selected remedy. This component of the selected remedy was not part of the preferred alternative in the Proposed Plan.

RESPONSIVENESS SUMMARY
FOR THE
RECORD OF DECISION
JACKS CREEK/SITKIN SMELTING & REFINING INC. SUPERFUND SITE
MAITLAND, MIFFLIN COUNTY, PENNSYLVANIA

TABLE OF CONTENTS

OVERVIEW 1

BACKGROUND 2

COMMENTS AND RESPONSES: A SUMMARY OF COMMENTORS' MAJOR ISSUES AND CONCERNS AND EPA RESPONSES.....3

A. Comments recieved from the public.....3
1. Extension of the Public Comment Period.....4
2. Health Monitoring.....4
3. Soil Contamination.....4
4. Treatment and Disposal of Soils.....5
5. Ground Water Contamination.....6
6. Fishing Advisories.....6
7. Potentially Responsible Parties.....7

B. Comments of Kirkpatrick & Lockhart on behalf of the Jacks Creek PRP Group.....8
1. Site Description.....8
2. Nature and Extent of Contamination Description Issues.....9
3. Description of Risks.....10
4. Identification of "Principal Threat" Material.....11
5. Appropriate Remedy for Higher-Concentration Lead Soils.....12
6. Consolidation and Capping of Pile Material and Contaminated Soils.....15
7. Consolidation Action Level for Lead.....15
8. Remediation of Floodplain Soils.....17
9. Sediment Removal from Jacks Creek.....18
10. Managment of Building Demolition Materials.....18
11. Cost Estimates.....19
12. ARAR Issues.....23

C. Comments of Eckert, Seamans, Cherin & Mellott on behalf of the Jacks Creek De Minimis Parties.....23

D. Comments of McNees, Wallace & Nurick on behalf of Joe Krentzman and Son, Inc.....24

E. Comments of the Pennsylvania Department of Environmental Protection .25
1. Comments Specific to Alternative 3.....26
2. Action-Specific ARARs.....27

RESPONSIVENESS SUMMARY
JACKS CREEK/SITKIN SMELTING & REFINING INC.
SUPERFUND SITE
MAITLAND, MIFFLIN COUNTY, PENNSYLVANIA

This community relations responsiveness summary is divided into the folowing sections:

Overview: A summary of the EPA's selected proposed remedy for the Site.

Background: A brief history of community interest and concerns raised during remedial planning at the Site.

Comments and Responses: A summary of the commentors' major issues and concerns and EPA's responses to those issues and concerns. Commentors may include local homeowners, businesses, the municipality, and potentially responsible parties (PRPs).

OVERVIEW

EPA completed two studies in August 1993 and November 1993. The first study, called a Remedial Investigation (RI), identified the types and amounts of contamination at the Site. The second study, called a Feasibility Study (FS), further evaluated the information in the RI and outlined possible cleanup methods. As a result of the RI activities, EPA discovered heavy metals, including antimony, cadmium, lead, and mercury, in the soils, waste piles, ground water, surface water, and sediment at the Site.

To address the contamination at the Site, EPA issued the Proposed Remedial Action Plan (Proposed Plan) on February 27, 1997. The Proposed Plan outlined the cleanup alternatives described in the FS Report and discussed in detail EPA's preferred cleanup alternative. Before issuing the Proposed Plan, EPA compared the proposed cleanup methods to a series of evaluation criteria. These criteria serve as cleanup standards for all Superfund sites. EPA's preferred method is the best combination of the evaluation criteria listed below.

Threshold criteria
- Overall protection of human health and the environment
- Compliance with applicable or relevant and appropriate requirements (ARARs)

Balancing criteria
- Long-term effectiveness and performance
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness
- Ability to implement
- Cost

Modifying criteria
- State acceptance
- Community acceptance

After considering state and community acceptance of the preferred alternative, EPA officially documented its selected alternative in the Record of Decision. EPA's selected alternative staisfies the criteria for remedy slection and meets all the cleanup objectives for the Site. As outlined in this Record of Decision, EPA's selected alternative - Excavation and Offsite Treatment and Disposal of Soils Exceeding 40,000 Parts Per Million (ppm) Lead; Consolidation and Capping of Remaining Materials Above 1,000 ppm Lead - includes the following measures to address the contamination at the Site:

1. Excavation, transportation, and offist treatment of soils with lead concentrations above 40,000 ppm.
2. Consolidation of soils and waste piles with lead concentrations between 1,000 and 40,000 ppm.
3. Vacuum dredging to remove sediment with lead concentrations exceeding 110 ppm from Jacks Creek, and onsite consolidation.
4. Placement of a multi-layer cap on the consolidated area.
5. Restore excavated areas with clean soil and revegetate.
6. Restore onsite wetlands areas.
7. Demolish the dilapidated onsite buildings.
8. Offsite disposal of drums/vat.

9. Place deed restrictions on a portion of the Site.
10 Construct an eight-foot high fence on the unfenced portion of the scrap yard.
11. Install strom water controls.
12. Conduct long-term monitoring of ground and surface water.
13. Post fish consumption advisories.
14. Conduct long-term operation and maintenance after cleanup is completed.

BACKGROUND

To announce the availability of and obtain public on the Proposed Plan, EPA held a public comment period from February 27, 1997, to March 29, 1997. On March 20, 1997, EPA held a public meeting to provide citizens with information about the Site and the proposed cleanup methods. The public meetings also provided an opportunity for citizens to ask questions about or comment on the Site and the proposed cleanup methods. EPA announced the public comment period and public meeting in a newspaper display advertisement placed in the February 27, 1997, edition of the Lewistown Sentinel. EPA also announced the public comment period and meeting in a four-page fact sheet, sent to those parties on EPA's site mailing list. The fact sheet also summarized the Proposed Remedial Action Plan.

Community interest in the Site has been relatively low throughout its entire history. Employees to Krentzman are concerned about their jobs, and want Krentzman to remain in business in its present location. There are however fishermen in the community who are concerned about the contamination of the fish in Jacks Creek.

COMMENTS AND RESPONSES: SUMMARY OF COMMENTORS' MAJOR ISSUES AND CONCERNS AND EPA RESPONSES

This section provides a summary of the commentors' major issues and concerns and EPA responses to the issues and concerns. The comments on the proposed remedy were received at the public meeting on March 20,1997, or by mail during the public comment period.

Concerns and questions presented in this section are placed into the following five categories:

A. Comments received from the public.

B. Comments of Kirkpatrick & Lockhart on behalf of the Jacks Creek PRP Group.

C. Comments of Eckert, Seamans, Cherin & Mellott on behalf of the Jacks Creek De Minimis Parties.

D. Comments of McNees, Wallace & Nurick on behalf of Joe Krentzman & Son, Inc.

E. Comments of the Pennsylvania Department of Environmental Protection.

The questions, comments, and responses are summarized below.

A. Comments received from the public

Comments received at the March 20,1997, public meeting, or by mail, are grouped into the following seven categories:

1. Extension of the Public Comment Period,
2. Health Monitoring,
3. Soil Contamination,
4. Treatment and Disposal of Soils,
5. Ground Water Contamination,
6. Fishing Advisories, and
7. PRPs.

1. Extenstion of the Public Comment Period

(a.) The PRP group requested, in writing, an extension of the public comment period for an additional thirty days.

EPA Response: EPA granted this request and extended the public comment period from March 29, 1997 to April 28, 1997.

2. Health Monitoring

(a.) A citizen asked whether there is any health monitoring and health and safety training of current and former employees who worked at the Site.

EPA Response: There has been no health monitoring of former employees. Present employees do attend a monthly safety meeting which focuses on preventing injuries during scrap yard operations. Employees do not wear face masks or respirators, and could be exposed to hazardous substances in airborne dusts while working in the scrap yard.

3. Soil Contamination

(a.) A citizen asked about the safe level of lead concentrations at the Site.

EPA Response: What EPA considers to be safe levels of lead contamination vary depending on where the lead concentrations are located on the Site and the closeness of the nearby residences. EPA cleans up residential areas to a more stringent level than industrial areas. The cleanup level for the Site is 1,000 ppm lead, except for the sediments of Jacks Creek. Any soils with a lead level above 1,000 ppm will be consolidated and placed beneath a multi-layer cap. The Commonwealth of Pennsylvania has identified the Pennsylvania Land and Recycling Act as an ARAR and regulations issued pursuant to this Act also establish a cleanup level of 1,000 ppm lead for this Site. The soils with lead levels above 40,000 ppm lead, which are the principal threat wastes at this Site, will be excavated and then treated at an offsite location. The cleanup level in the Jacks Creek sediments in 110 ppm, which is based on the potential impact of lead on the creek environment.

(b.) A citizen asked whether Site soils contaminated with PCBs will be cleaned.

EPA Response: Soils or sediments contaminated with PCBs will be consolidated along with the rest of the contaminated soils and sediments at the Site. Lead is used as an indicator compound in determining the levels of cleanup for all the contaminants in the soil because lead is the most widespread contaminant on the Site. PCBs were detected at elevated levels in only a few discrete onsite areas.

4. Treatment and Disposal of Contaminate Soils

(a.) A citizen asked whether EPA is considering chemical fixation as an alternative for treating the contaminated soils.

EPA Response: This process is included in a number of the cleanup alternatives in the Proposed Plan and the ROD. The process of chemical fixation mixes contaminated materials with other substances to ensure that the contamination stays in the soils and will not leach to the surrounding environment. Chemical fixation is a feasible way to treat the waste onsite and this option is included in the onsite treatment alternatives, Alternatives 4, 5, and 6. Chemical fixation will be used at an offsite location to treat the highly-contaminated soils in EPA's selected alternative (Alternative 3).

(b.) A citizen asked how EPA will treat soils contaminated with chemicals other than lead.

EPA Response: The onsite soils are contaminated with a number of different contaminants. Lead is the compound which is being used as the indicator compound of site contamination. Soils or waste piles which contain lead levels of 1000 ppm or greater will be consolidated and capped but not treated offsite. The highly-contaminated soils, containing lead levels of 40,000 ppm or greater, will be excavated and treated offsite. The chemical fixation process is not specific to lead and is effective on a number of metals present in onsite soils. This process will be performed at an offsite treatment facility as part of the EPA's selected remedy.

(c.) A citizen inquired as to the location of the treatment and disposal site for the soils with lead concentrations above 40,000 ppm.

EPA Response: Gannett Fleming, EPA's contractor who performed the RI/FS, asked Clean Harbors, Inc., an environmental company specializing in remdiation, to develop a realistic cost estimate for offsite transportation and disposal of the soils

with lead concentrations above 40,000 ppm. Clean Harbors calculated the unit cost of $140 per ton for transportation, treatment and disposal of the soils without selecting a specific disposal location for the waste. There are several potential treatment and disposal facilities relatively close to the Site, and the actual disposal of the onsite wastes is still a number of years in the future.

(d.) A citizen asked why an offsite facility would be a better place to deposit the contaminated soils.

EPA Response: Offsite facilities are permanently existing disposal facilities where contaminated soils may be treated, stabilized, and placed into a lined storage area. Transporting and disposing wastes offsite is generally faster, less expensive and more effective than constructing, testing and then utilizing a newly-built onsite treatment facility.

(e.) A citizen asked whether EPA could treat the contaminated waste onsite.

EPA Response: EPA considered onsite treatment of contaminated soils as one of the alternatives in the Proposed plan. It is possible to treat the waste onsite but it would be more difficult than treating it offsite. EPA determined that only the heavily-contaminated waste should be treated offsite. Offsite treatment is more cost effective than onsite treatment.

(f.) The same citizen asked whether EPA has considered reclaiming the material from the contaminated soils.

EPA Response: EPA considered reclaiming or recycling the metals from the contaminated soils and waste piles as part of the FS. The metal levels in the contaminated materials at the Site are not high enough to make this process feasible or economically viable. The levels of zinc, cadmium and other metals in the waste piles would have to be much higher in order for recycling to be a feasible treatment alternative.

5. Ground Water Contamination

(a.) a resident inquired about the effects of the Site on ground water the area.

EPA Response: As part of the remedial investigation activities, EPA placed numerous monitoring wells onsite to study the ground water in both the shallow and the deep aquifer. Samples from the monitoring wells show the levels of contaminants in the ground water beneath the Site to be below the maximum contaminant levels (MCLs). The MCLs, which are described in 40 C.F.R. °° 141.61 and 141.62, are the maximum permissible level of a contaminant in water which is delivered to any user of a public water system. The ground water beneath the Site does contain some contaminants, but the levels are not high enough to presently be a threat to human health.

6. Fishing Advisories

(a.) a citizen inquired about the possibility of fish contaminated with PCBs downstream from the Site and asked why EPA is not posting fishing advisories along the entire length of Jacks Creek. The citizen commented that because the contaminated fish near the Site could migrate, advisories should be posted all the way to the Juniata River.

EPA Response: The Pennsylvania Department of Environmental Protection (PADEP) is in agreement with EPA that fish consumption advisories should be posted on Jacks Creek in the vicinity of the Site. This will be done as one component of the selected remedy. PADEP also agrees that the signs should be taken down after the fish are no longer a threat to human health if eaten. The fish downstream from the Site were not found to be contaminated in sampling done during the RI. Therefored the fish consumption advisories will only be posted in the immediate vicinity of the Site, and only until the fish are no longer found to contaminated during periodic sampling.

7. PRPs

(a.) A citizen asked whether someone is a PRP if they owned property on or around the Site, but never contributed to the contamination of the Site. The citizen

used the railroad track running through the Site as an example.

EPA Response: Under the Comprehensive Environmental Response, Compensation and Liability Act, as amended, (CERCLA), all present owners of site property at the time of disposal are PRPs. Owners of nearby or adjacent properties are not PRPs.

(b.) A citizen inquired about the number of PRPs for the Site, and asked how many are still in business.

EPA Response: EPA believes that approximately 300 PRPs for the Site are still in business. The PRPs are distinguished into different groups depending on their level of involvement and how much waste they sent to the Site. These groups are the owner of the Site, de maximus parties, and de minimis parties. The Site also has a large number of PRPs who contributed waste to the Site but are no longer in business.

(c.) A citizen asked if EPA has attributed a percentage of responsibility to each of the PRPs and whether this information is available to the public.

EPA Response: EPA examined all of the Site's former records and performed volumetric analysis to estimate the amount and types of waste for which each of the PRPs is responsible. This information is available to the public in the Administrative Record File at the Mifflin County Library. The Administrative Record File is an official collection of reports, correspondence, and other documents that reflect EPA's process of selecting the cleanup plan for the Site. Residents also may write the Freedom of Information Officer for this information, or Garth Connor, the EPA's Remedial Project Manager for the Site.

(d.) A citizen asked how Krentzman's operations at the Site will be affected during the cleanup process, and whether Krentzman will be restricted from using the cleaned portions of the Site in the future.

EPA Response: The cleanup at the Site will be planned so that Krentzman's operation will affected as little as possible. Krentzman's business will not be closed during any part of the cleanup. However, Krentzman's employees may be restricted from accessing certain portions of the property during critical parts of the cleanup process. After the cleanup is completed, deed restrictions will be placed on the property which will restrict certain actions, such as the drilling of drinking water wells, from occurring onsite.

B. Comments of Kirkpatrick & Lockhart LLP on behalf of the Jacks Creek PRP Group

In a 21-page document dated April 24, 1997, Kirkpatrick & Lockhart LLP (Kirkpatrick) commented on the Proposed Plan on behalf of the Jacks Creek PRP Group. The document included the following twelve categories of specific legal and technical comments regarding the Proposed Plan:

1. Site Description,
2. Nature and Extent of Contamination Description Issues,
3. Description of Risks,
4. Identification of "Principal Threat" Material,
5. Appropriate Remedy for Higher-Concentration Lead Soils,
6. Consolidation and Capping of Piles and Contaminated Soils,
7. Consolidation Action Level for Lead,
8. Remediation of Floodplain Soils,
9. Sediment Removal from Jacks Creek,
10. Management of Building Demolition Materials,
11. Cost Estimates, and
12. ARAR Issues.

The specific legal and technical comments are summarized on the following pages.

1. Site Description

(a.) Kirkpatrick requested that it noted that the Site is currently zoned for industrial use and hosts an active and ongoing recycling operation. Immediately to the west of the Site

are the American Viscose and FMC Landfill properties. Both the American Viscose and FMC properties are significant potential sources of concern to Jacks Creek and the surrounding environment. As the challenges of the Site are addressed, joint efforts must be made throughout the area to provide the full level of hoped-for benefit to Jacks Creek.

EPA Response: The adjoining properties contain hazardous substances which potentially could impact human health and the environment. EPA and PADEP staff will monitor the condition of the adjoining properties to ensure that hazardous substances are not being release to the Site or the surrounding environment from these offsite sources.

(b.) Kirkpatrick understands that the present Krentzman operations go beyond the "metal scrap yard and aluminum recycling" activities named on page 2 of the Proposed Plan. In the design of ongoing monitoring and review programs, any issues arising from active operations should not be confused with the performance of the remedy being applied to the problems created by Sitkin's former operations.

EPA Response: EPA understands that there is an active scrap yard onsite which potentially could have an impact on human health and the environment in the future. EPA is also hopeful that the scrap yard will still be in business on a portion of the Site even after the cleanup has been completed. After the cleanup is completed, there will be a number of restrictions placed on the property deed which will prevent the onsite business from engaging in activities which would be potentially harmful to the constructed remedy, or its operation and maintenance.

2. Nature and Extent of Contamination Description Issues

(a.) The Proposed Plan lists several classes of chemicals in describing organic contamination at the Site. The Proposed Plan should disclose that these findings are limited to certain areas on the Site which have relatively low levels of the contaminants.

EPA Response: There are organic substances at the Site, such as PCBs, which are significant onsite contaminants. The PCBs found in fish tissue potentially could impact human health. However, it is true that inorganics, such as heavy metals are the most significant contaminants at the Site and that lead is the most widespread of these contaminants.

(b.) The Proposed Plan contains inconsistencies regarding the condition of the waters. Page 8 of the Proposed Plan states "All surface water samples from Jacks Creek were relatively free of organic and inorganic contaminations." However, page 7, sentence 1, implies the surface waters are contaminated. The data shows that the surface waters are not affected by contamination from the Site.

EPA Response: Although some of the sediments and a number of the fish of Jacks Creek were found to be contaminated, the actual surface waters in Jacks Creek generally were free of site contamination. The water in Jacks Creek flows fairly rapidly downstream. Contaminants present in this water would generally be dispersed and diluted by the natural flushing action of the creek. Site contaminants were found to be present in several smaller, slower-moving tributaries of Jacks Creek running across the Site.

(c.) The Proposed Paln describes the Site's ground water as contaminated, but both the remedial investigation study and the most recent sampling indicate that the aquifer is not affectd by concentrations of contaminants above safe drinking water levels. The Proposed Plan's discussion of contaminants found in private wells may mislead readers into believing that such constituents came from the Site. The data indicates that water beneath the Site does not flow toward area private wells. Relatively low lead concentrations previously found in some private wells in the area were apparently associated with lead leaching from household plumbing.

EPA Response: The ground water at the Site has been sampled four times in recent years. Although several wells were found to contain contaminants above a Maximum Contaminant Level (MCL) in a particular round of sampling, no well has had samples consistently above an MCL for any contaminant. In the most recent sampling, no contaminant in any of the wells was found to be above MCLs. The contamination in the soils and waste piles are significantly more of a threat to human health and the environment than the contamination in the ground water.

(d.) The sampling data shows that there is no significant ground water contamination on or around the Site. None of the ground water samples collected by the PRPs in the latest

round of sampling contained lead above the detection limits. The most abundant contaminants of concern in the Ball Mill Tailing Pile and Aluminum Dross Pile were found in ground water, in either the shallow or deep wells above the established detection limits. The sampling indicated that there is a vertically upward flow of ground water within the saturation zone, inhibiting the vertical migration of those low concentrations of metals detected in some of the shallow wells at the site. Another study showed that following implementation of a multi-layer cap remedy, lead concentrations in ground water immediately beneath the affected contaminated areas would be negligible. The model predicts that regardless of source concentrations, lead from the source areas would not reach the saturated zone within the 100-year time period following implementation of a cap remedy.

EPA Response: The selected remedy calls for continuous monitoring of the ground water. The ground water contamination at the Site currently does not warrant treatment of any kind. Future monitoring of the ground and surface water near the Site will ensure that the contamination levels are not increasing to dangerous levels.

(e.) The ecological risk assessment in the Proposed Plan describes the soil on the Site as lacking vegetation or showing stunted vegetation. Because much of the area of the Site is currently being used and will likely continue to be utilized as an active scrap yard, the focus should be on preventing the on-going generation of sediment from contaminated areas from entering the floodplain or Jacks Creek.

EPA Response: Surface runoff is a serious source of contamination to the sediments of Jacks Creek. The lack of begetation on certain portions of the Site increases the amount of surface runoff reach Jacks Creek and its sediments. A large portion of the Site, including the entire consolidation area will be revegetated after the cleanup is completed. This action should greatly reduce the amount of surface runoff reach Jacks Creek.

3. Description of Risks

(a.) Pages 9 and 10 of the Proposed Plan describe the results of the baseline risk assessment, which indicats that lead is a primary contaminant associated with the derived risk. Lead was not evaluated quantitatively in the risk assessment.

EPA Response: Lead does not have a threshold value so it cannot be included in the Hazard Index calculation with other metals in the non-carinogenic portion of a Risk Assessment at any site. Lead also does not have a slope factor so it can't be included in the carcinogenic risk calculation at any Site. Hoever, the recently-developed adult lead model for industrial sites was used for this Site, as described in the Proposed Plan, so the potential impacts of lead were evaluated for this Site.

(b.) The description of chemicals and pathways and the derived cancer risks and hazard index values provided in the Proposed Plan are misleading. Data collected indicates that PCBs and pesticides are not widespread at the Site. These contaminants were found elevated only in very isolated areas of the Site.

EPA Response: Although the organic compounds are localized and are not widespread, several of the contaminants are significant in certain aspects of the risk assessment. For example, PCBs are a significant contaminant in fish tissue. The Hazard Index is 14 for adults, well above the 1.0 threshold level, for people consuming the fish in Jacks Creek on a regular basis. PCBs are a significant contaminant at this Site.

4. Identification of "Principal Threat" Material

(a.) The justification for calling soils at the Site with concentrations of 40,000 ppm of lead a "principal threat" is not well supported in the Proposed Plan. The only explanation offered by EPA is a statement on page 11 of the Proposed Plan that the 40,000 ppm lead treatment level is "exactly two orders of magnitude above the 400 ppm residential screening level."

EPA Response: As stated in the Preamble to the NCP "EPA expects that treatment will be the preferred means by which to address the principal threat wastes posed by a site wherever practicable. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur." Soils containing 40,000 ppm lead or greater have significant concentrations of highly toxic materials. The justification for the 40,000 ppm lead treatment level is that it is exactly two orders of magnitude above the residential screening level of 400 ppm lead. The residential screening

level is a level which would allow for unrestricted use and unlimited exposure. Therefore the screening level number is the correct number to use in developing a principal threat number.

(b.) The arbitrary reference to residential action levels is not a basis for defining principal threat material. The Site is clearly an industrial site, with expectations of future industrial use. The risk against which the "principal threat" must be measured is the risk posed under the existing and anticipated site use scenario.

EPA Response: The portion of the NCP that discusses principal threat refers to high concentrations of toxic compounds (e.g., several orders of magnitude above levels that allow for unrestricted use and unlimited exposure). The principal threat level should not be calculated as two orders of magnitude above an industrial use setting because that is a restricted use that would not allow for unlimited exposure.

(c.) EPA guidance emphasizes the mobility of "principal threat" material. The lead in soil and onsite pile materials has not leached to any significant degree. The lead contaminated soils can be readily contained in a consolidation/capping remedy without further treatment.

EPA Response: Mobility is one of several concepts to be considered in the principal threat guidance. High concentrations of highly toxic materials is another description used for principal threat wastes. Concentrations as high as 16% lead were found at the Site. This level of contamination is too high to adequately protect human health and the environment utilizing consolidation and capping without any treatment.

(d.) The base line risk assessment at the Site shows risk ranges for most exposure scenarios and pathways of 10 -4. Notably, those risk analyzed result from contaminants other than lead.

EPA Response: Lead is ubiquitous at this Site and is therefore used an an indicator of site contamination. There are many other contaminants at the Site which also contribute to the risk at the Site. Because lead was used as the indicator compound does not mean that it is the only contaminant onsite that EPA feels is thretening human health or the environment. Lead does not have a threshold level, as safe exposure level, so it can not be included in the calculation of a Hazard Index. The Hazard Index is a ratio, the contaminant concentration that a person can be exposed to at a site divided by the safe exposure level for that same contaminant. A compound without any safe exposure level would not have a denominator in the ratio, so there can't be a Hazard Index for that compound.

5. Appropriate Remedy for Higher-Concentration Lead Soils

(a.) Potential risks posed by soils containing elevated concentrations of lead can be addressed effectively through an onsite capping remedy.

EPA Response: The vast majority of soils can be effectively addressed though an onsite capping remedy. However, EPA feels that there are principal threat wastes onsite which should be excavated and then treated onsite.

(b.) There will be no real reduction in risk provided by transporting certain soils to an offsite treatment facility and the Proposed Plan fails to provide any evidence that the marginal benefit of such treatment justifies the accompanying costs and risks. The remedy in Alternative 2 is fully protective. EPA's own plan indicates that both Alternative 2 and 3 meet the National Contingency Plan (NCP) criteria.

EPA Response: The NCP creates an obligation to remove or treat principal threat wastes. By removing the principal threat wastes, the entire remedy is more protective because the worst of the onsite contamination has been removed from the Site.

(c.) The Proposed Plan fails to recognize the risks of transporting the contaminated materials for offsite treatment and disposal. Based on EPA's estimate of 14,000 tons of lead-contaminated soil, 725 truckloads of materials would have to be transported through the community to the offsite facility. Based on distances to the two nearest offsite facilities and published highway accident risk statistics, an estimated 1.0 - 1.4 accidents likely will result, with esimated casualties of between 0.23 and 0.34. The PRPs estimate the volume of soil to be much higher than EPA's estimate, increasing the likelihood of accidents.

EPA Response: Gannett Fleming did a very conservative estimate, including a large safety

factor, of the amount of soil onsite containing 40,000 ppm lead or greater. The amount of solid which will actually be transported offsite during the Remedial Action is most likely less than that conservative estimate. This means that there will be fewer truckloads of soil and the odds of an accident happening are much lower than the above calculation. The risk to human health of moving this relatively small amount of soil is very low and should not be exaggerated.

(d.) Considering the added risk and EPA's estimate of at least $2.7 million in additional costs, the PRPs question whether there are any marginal benefits to excavating and taking the contaminated soils offsite. The PRPs estimate the cost to be an additional $8-10 million.

EPA Response: Getting the worst of the contamination offsite is a cost effective remedy. EPA estimated that cost to be approximately $2,500,000 which assumes that there are approximately 14,500 tons of soils containing 40,000 ppm lead or greater. If this is an overestimate of the highly-contaminated soils onsite, then the cost of that component of the remedy would actually be lower than the EPA estimate.

(e.) The PRPs have concerns regarding the possibility of becoming involved in another Superfund or waste site in the future. If the PRPs perform the remedy, they do not want to become "arrangers" for treatment or disposal at another facility that may have a mixture of existing or future problems.

EPA Response: The highly-contaminated soils, which are being treated and disposed of offsite, are the only principal threat wastes onsite. These principal threat wastes need to be taken offsite in order to make the remedy protective of human health and the environment. The offsite treatment and disposal in a permitted hazardous waste treatment facility should alleviate the concern regarding the possibility of involvement at a future waste site.

(f.) The basis for EPA's estimate of the volume of "principal threat" material is notably sparse. The Proposed Plan assumes a volume of 14,500 tons of such material and the volume estimate becomes the basis of the subsequent cost evaluation (and presumably the basis of the decision that this approach is feasible and potentially cost-effective). However, EPA has very limited sampling data on which to base any volume estimates. Only six samples from the remedial investigation and feasibility study activities showed concentrations of lead greater than 40,000 ppm. If EPA's estimates of these volumes are not accurate, the cost, risks, and feasibility considerations for this "treatment" element will be greatly altered.

EPA Response: Gannett Fleming did a very conservative estimate for EPA of the amount of principal threat waste onsite. The amount of highly-contaminated soils onsite could easily be closer to 5000 tons than 14,500 tons. The price is a real price from an environmental services company for what they would actually charge to do that component of the remedy.

(g) EPA has not evaluated whether the commercial hazardous waste treatment facilities in Pennsylvania can take the material involved. Restrictions placed on the incoming materials to these facilities may prevent the acceptance of contaminated soils containing a combination of constituents. Thus, there is no assurance that offsite treatment is a feasible option in this situation.

EPA Response: This is not true. The cost estimate was for commercial waste treatment facilities accepting the waste from the Site in Pennsylvania.

(h.) The Proposed Plan does not indicate how one would determine the area of materials with lead concentrations greater than 40,000 ppm. What sampling (on what grid, frequency, and test methods) will be required before and during the waste pile and soil excavation process?

EPA Response: The exact parameters of the sampling methodology will be determined during the Remedial Design portion of the remedial process.

(I.) Are the costs of sampling to find and classify material with lead concentrations greater than 40,000 ppm included in EPA's cost analysis?

EPA Response: Yes. The cost estimates main components are the excavation, transport and disposal of the wastes. However, the cost estimate also includes a 20% additional cost, a total of $408,560, for contingencies and oversight. The soil sampling required would be a relatively minor contingency because much of the soil classification has already been done as a result of the soil sampling during the RI. Some additional sampling would be required to insure that cleanup goals are being met, but it would also be a relatively small cost.

(j.) Are those costs, and the time delays consumed in efforts to identify this material, justified by the minimal benefits to be gained?

EPA Response: Since the worst of the waste is being treated offsite, the entire remedy becomes more protective of human health and the environment.

(k.) EPA's assumption that certain sampling and analytical techniques will be used (specifically XRF) should be stated in the Proposed Plan, since the methods used for outlining the "hot spot" areas may affect significantly the final cost and implementation time of the selected remedy.

EPA Response: At this time, EPA is not certain which techniques will be used. This decision will be made during the Remedial Design. XRF was sued by EPA's removal program at this Site and it work fairly well in defining an extent of contamination on the eastern end of the Site.

6. Consolidation and Capping of Pile Material and Contaminated Soils

(a.) The proposed form of cap described in the Proposed Plan appears to be a cap with a single barrier layer. The PRPs emphasize that the consolidation of all onsite materials under a "composite" cap, using a combination of two barrier layers, appears to be the most protective and cost-effective approach for this site. If, and only if, EPA determines that all materials can stay onsite without treatment, the PRPs would support upgrading the cap to a composite design.

EPA Response: The installation of a second barrier layer is not cost effective on a consolidation area of this size.

7. Consolidation Action Level for Lead

(a.) Alternative 3 recommends an action level of 1,000 ppm of lead concentrations in upland soils. EPA does not provide a reference for the cited 500-1,000 pm range, but appears to be relying on early EPA guidance (OSWER Directive #9355.4-02, September 1989). This 1989 guidance recommended a soil cleanup level of 500-1,000 ppm for protection of human health at residential CERCLA sites. EPA appears to be extrapolating residential cleanup levels to an industrial site. As stated in the cited guidance document, the guidance is based on a recommendation of the Centers for Disease Control which focuses on protecting children in residential settings. The Proposed Plan's attempt to borrow an outdated range, intended for assessing childhood exposures to lead, and apply it to an adult population in an industrial setting is improper and unsupportable.

EPA Response: In past years, EPA had utilized the recommended cleanup level for lead (Pb) of 500-1,000 ppm and had traditionally used the high end of 1,000 ppm as the cleanup level for Pb for industrial land use. While the new EPA guidance (Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, OSWER Directive #9355.4-12) recommends a screening level for Pb in residential soil of 400 ppm, the use of 1,000 ppm as the cleanup level for the Site (an industrial property) represents a protective level as indicated by the Adult Pb Model developed by the TRW (EPA, 1996). By focusing on fetal protection for a pregnant employee, the new Adult Pb Model can be used to calculate an industrial cleanup level. The protective range developed from this model is between 750 ppm and 1,750 ppm, with a midpoint of approximately 1,250 ppm. This supports the use of 1,000 pm as a soil Pb cleanup level at the Site. In addition, the Commonwealth of Pennsylvania has identified the Pennsylvania Land Recycling Act as an ARAR, and regulations issued pursuant to this Act establish a lead cleanup level of 1,000 ppm for this Site.

(b.) The Proposed Plan cites an interim model recently produced for assessing adult exposures to lead which was used by the Technical Review Workshop (TRW) for lead. Borrowing from this report, the Proposed Plan states that the cleanup goal of 1,000 ppm is "approximately the midpoint of the protective range" (750 to 1,750 ppm). Without a thorough evaluation of the assumptions used in the example presented by the TRW, or any indication that those assumptions are applicable to this Site, the happenstance of the cleanup goal being approximately the midpoint of the "protective range" is not adequate justification for its adoption at this Site.

EPA Response: The Administrative Record describes the exact calculations EPA used at this Site to calculate a lead (Pb) cleanup level utilizing the model developed by the

Technical Review Workgroup. A deteailed discussion the TRW's Adult Pb Model is presented in the December 1996 report entitled, " Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Asssociated with Adult Exposures to Lead in Soil," (EPA, 1996). A copy of this report is enclosed for your reference. The report describes the basic algorithms that are used in the methodology and provides a set of default parameter values that can be used in cases where high quality data are not available to support site-specific estimates. The rationale supporting each parameter default is provided in the Appendix of the report.

(c.) The TRW's example model output of 1,750 ppm was developed based on a default lead absorption factor of 12 percent. If alternative absorption factors in the range of eight percent, cited in the literature, are used, the model output would change from 1,750 ppm to 2,600 ppm. The form of lead present is not very soluble and is unlikely to be as bioavailable as suggested by a 12 percent absorption factor.

EPA Response: The use of a soil lead (Pb) absorption factor of 12 percent is consistent with the Adult Pb methodology (EPA, 1996; pp. A15-A19) developed by the TRW (see EPA Response to Item 7b). This default value is based on a weight of evidence determination from the best available experimental estimates of the bioavailability of soluble Pb in adult humans, and the relative bioavailability of soil Pb compared to soluble Pb. EPA recognizes the sensitivity of the cleanup level to the absorption factor used in the Adult Pb Model. Indeed, the model was designed to accommodate the use of high-quality site-specific data to define this and other parameter values (EPA, 1996; pp. A-19). In the absence of persuasive evidence to adjust the bioavailability factor on a site-specific basis, the TRW recommends a default estimate of 12 percent. Use of the Adult Pb methodology results in a cleanup level of Pb at the midpoint of approximately 1,000 ppm. The midpoint is justifiable and preferred over the more conservative estimate of 750 ppm or the less conservative estimate of 1,750 ppm.

(d.) On behalf of the PRPs, ENVIRON applied the same model used by the TRW in the report "Risk Evaluation of Areas Outside of Proposed Cap and Development of Action Level for Lead" to develop the cleanup level of 2,500 ppm. The memorandum provided to the PRPs from EPA criticizing ENVIRON's report is not well founded. While the ENVIROn evaluation uses a different absorption factor than the TRW default of 12 percent, EPA did not offer any technical discussion or justification as to why an assumed 12 percent absorption factor is appropriate.

EPA Response: The use of a soil lead absorption factor of 12 percent is consistent with the Adult Pb methodology (EPA, 1996, pp. A15-A19) developed by the TRW. As discussed in EPA responses to 7b and 7c above, default values are indicated in the absence of high-quality site-specific data.

e.) Use of an absorption factor in the range of 8 to 12 percent results in the ENVIRON-calculated cleanup levels in the range of 1,700 ppm to 2,500 ppm. These are both substantially higher than the 1,000 ppm value arbitrarily reflected in the Proposed Plan. The PRPs believe that the selected action level should be in the range of 2,000 ppm.

EPA Response: The PRPs incorrectly applied the Adult Lead (Pb) Model developed by the TRW (EPA, 1996). There were errors in the algorithm used for the calculation of the cleanup level. Many exposure parameters were changed, which resulted in a cleanup level for Pb of 2,500 ppm. The most significant exposure parameter that was changed is the soil Pb absorption factor (see EPA responses to 7b-7d, above). If the mathematical errors are corrected and the appropriate absorption factor is used (12 percent, not 8 percent), the PRP's model predicts a cleanup level for Pb of 1,444 ppm, which is within the range recommended by the TRW of 750 to 1,750 ppm.

8. Remediation of Floodplain Soils

(a.) Excavating soils in the wooded areas may be difficult and might cause greater disturbance of natural resources than the benefits to be derived from such effort. If, during design, it is found that there are areas on the "margin" of the 1,000 ppm level, the PRPs question whether the benefit provided by removing this soil would be worth the accompanying disturbance of the woods, with the increase in erosion potential.

EPA Response: EPA generally agrees with this analysis. In the main wooded area on the Site, lead levels are well below 1000 ppm lead. This area, in the northeast corner of the Site, will be left undisturbed. However, there are other areas onsite with lead levels well

above 1000 ppm lead that are wooded to some extent. These areas will be excavated, and then revegetated.

(b.) The PRPs request that the four acre area with less than 1,000 ppm contamination, that is contemplated for covering, be specifically identified now with a map to be included in the Record of Decision.

EPA Response: The exact size and location of this non-forested floodplain area will be determined during Remedial Design. However, it should be pointed out that only about 24 of the 105 acres onsite is located in the floodplain. The covered area has to be non-forested floodplain area with lead levels below 1000 ppm lead.

(c.) The Proposed Plan raises a concern with respect to whether the suggested method of placing additional soils in the floodplain will comply with ARARs. Such an alteration of the floodplain cross-section and profile would presumably be governed by the Pennsylvania Flooplain Management Act and associated implementing ordinaces, which restrict placement of fill in floodplain area where the effect would be to restrict flood flow or raise floo water elevations.

EPA Response: The relatively small area of floodplain soils which will be covered with eighteen-inches of fill material as part of the remedy at this Site would not have a significant impact on either flood flows or flood water elevations.

(d.) The placement of additional soil in the floodplain raises a concern regarding the potential for furture erosion and maintenance. It appears that the area is subject to periodic serious flooding with high velocity flows. Under these circumstances, it may be very difficult to maintain a consistent 18 inch fill cover over native soils, particularly in areas nearest the stream.

EPA Response: The fill material in these areas will be compacted, graded and revegetated as part of the selected remedy. These revegetated areas should be resistant to erosion, and not require much maintenance in future years.

9. Sediment Removal from Jacks Creek

a.) The Group requests that the sediment areas requiring removal be identified in the Record of Decision.

EPA Response: Sediments above 110 ppm lead that are in depositional areas in close proximity to the Site will require removal. The exact locations and amounts will be determined during the Remedial Design.

10. Management of Building Demolition Materials

(a.) The Proposed Plan should allow the option for debris generated from the demolition of onsite buildings, including the Precious Metal Building and certain other affected structures, to be consolidated with the contaminated soil and pile materials placed under the cap. There is some probability that some or all of the materials in question will be contaminated and would not be accepted for disposal at a typical demolition/construction landfill without expensive "decontamination."

EPA Response: The selected remedy includes offsite disposal of the building debris. This debris will not be placed in the consolidation area because of engineering concerns.

11. Cost Estimates

(a.) According to an October 30, 1996, memorandum from Gannett Fleming, Inc. to EPA, the volume of soils exceeding the 40,000 mg/kg total lead limit was estimated at approximately 2 acres, or 14,500 tons. Parsons believes the volume fo soils exceeding the 40,000 mg/kg action level to be approximately 24,800 tons of soil, an affected area of 3.55 acres. It has been Parsons' experience at a variety of sites that lead contamination in soils tends to be very "spott" in occurrence and relatively cursory sampling will typically yield an initial number of "hot spots" which underestimate the existence of other "hot spots" in the general area. Depending on the level of investigative scrutiny applied to these areas, the amount of soil found to exceed a given action limit could be significantly higher than EPA's initial estimates.

EPA Response: Gannett Fleming added a large safety factor in calculating the amount of highly-contaminated soils. having a large safety factor in the calculations means that Gannett Fleming may have over-estimated the amount of soils having 40,000 ppm lead or greater. The amount of these soils is probably less than the 14,500 tons Gannett Fleming estimated, and therefore the cost of that component is probably an overestimate of cost of that component of the remedy.

(b.) Gannett Fleming has estimated a cost of $2.5 million for excavation and disposal based on a unit cost of $140 per ton - a value which allegedly is based on an informal quote from Clean Harbors. The specifics are not included in Gannett Fleming's submittal to EPA and it is difficult to ascertain the assumptions used in this estimate. Also, the cost of treatment does not seem to be included in the Gannett Fleming cost estimate. The PRPs are concerned that management of this material could cost more than the $2.5 million estimated.

EPA Response: The estimate from Clean Harbors was not an informal quote, it was a real price for performing the transportation, treatment and disposal of the highly-contaminated soils at the time it was given. It was also a price for the actual soils onsite, and the site's contaminants were described to Clean Harbors. Obviously, the price could be different by the time of the actual cleanup several years from now. In several years, there could be a tremendous excess of landfill space, and the price for disposal could drop substantially. On the other hand, a number of landfills could close in the next few years and the demand for landfill space and thus the price for disposal could rise. The price could also stay the same in the next few years, which would mean the price would still be the same at the time of the actual cleanup. It is all conjecture at this point as to whether the price will go up, go down or stay the same. The price from Clean Harbors is based on a total waste volume of 14,500 tons which was estimated by Gannett Fleming and includes a significant safety factor.

(c.) The cost of sampling and classifying lead levels on the Site does not appear to be included in EPA's cost estimate.

EPA Response: Most of the contamintated soils are already classified as a result of the extensive soil sampling conducted by Gannett Fleming during the RI. The sampling required during the cleanup would be sampling to insure that soil cleanup goals are being met. This is relatively minor, inexpensive and is 10% contingency and oversight expense included in the cost of this component of selected remedy.

(d.) In reviewing Gannett Fleming's estimated costs for Alternatives 2 and 3, Parsons found a number of arithmetic errors and a few questionable assumptions in the evaluation of capping costs. For example, Gannett Fleming appears not to have included any "expansion" or "fluffing" factor with respect to those soils that are to be excavated and consolidated. Gannett Fleming also appears to have assumed use of a smaller capping area with a higher total elevation compared to the configuration used by Parson. EPA should closely review these calculations before including any final estimated cost figures in the Record of Decision.

EPA Response: Gannett Fleming anticipated that the consolidation pile would be compacted with a bulldozer which or minimize or even eliminate the need for a fluffing or expansion factor. The expansion of the consolidated soils would be minimal under these conditions.

(e.) In the cost estimates reflected in the Proposed Plan, Gannett Fleming did not appear to allocate any costs for site preparation, such as erosion control, utility relocation, work plans, bonds, and many other items. Parsons' previously submitted cost estimates allocated approximately $0.8 million for site preparation.

EPA Response: Clearing and grubbing which is part of site preparation are allocated as cost items in developing a total cost for the cleanup. Erosion control is also included as a separate cost item. Preparation of work plans is also included, but is considered to be part of the engineering costs of the selected remedy. Bonds and utility relocation are easily covered by the contingency costs which are included in the costs of the selected remedy.

(f.) The cost estimate for Alternative 2 of the Proposed Plan does not specify the removal of drums from the site, deed and access restrictions, or provisions for 5-year reviews. For Alternative 3, the Proposed Plan's estimates only allocate $1,000 for deed and access restrictions and budgets no costs for 5-year reviews. Parsons has included these items within its revised cost estimate.

EPA Response: Alternative 2 and Alternative 3 are more thoroughly described in the Record of Decision than they were in the Proposed Plan. The minor components, such as

deed restrictions, of all these alternatives are more clearly delineated in the Record of Decision.

(g.) For building demolition and disposal, the Parsons and Gannett Fleming cost estimates are similar with the exception of the Precious Metals and Smelter Buildings. Gannett Fleming has used an estimate that is much lower than the unit cost estimate used for other buildings. The net effect is that the Parsons estimate for this item is $0.3 million higher than the Gannett Fleming estimate.

EPA Response: The unit cost of demolition and disposal was the same for all the buildings onsite. Gannett Fleming used Means Cost Estimate Guide in order to calculate these costs on a cost per cubic foot basis.

(h.) The cost estimates prepared by Parsons' in the Addendum Feasibility Study utilized 1995 costs. In updating these estimates, Parsons has added a yearly inflation rate of 3 percent to adjust costs for general industry tasks, such as fence construction, trailer rental, etc. In addition, a one percent yearly inflation rate was used to adjust line item costs typically associated with the environmental remediation industry, such as remedial work requiring 40-hour trained personnel, engineering consulting activities, etc.

EPA Response: The costs described above are relatively minor, and are easily covered by the engineering costs which is added to many of the components of the selected remedy.

(I.) The costs estimated for capping are dependent on the size of the area to be capped. Gannett Fleming assumed the capped area would be 22 acres in size. The Parsons estimates were based on two scenarios - 26 acres and 36 acres. This balance between the acreage for consolidating and capping is an important design issue.

EPA Response: EPA used Gannett Fleming's cost estimates in the Proposed Plan and the ROD. The exact size and locationi of the consolidation area will be determined during the Remedial Design.

(j.) The $1 million Operation & Maintenance (O&M) cost value for Alternative 2, as shown on page 12 of the Proposed Plan is incorrect. The $1 million figure is a 30-year present worth rather than an annual present worth.

EPA Response: $82,000 is the correct amount for one year, which is a total of $1 million for a 30-year period. The Proposed Plan contained the 30-year figure, the ROD lists Alternative 2, and all the other alternatives with the one-year O & M cost. Both figures are correct, but are for different time periods.

(k.) It appears that the Proposed Plan's O&M cost estimates used for the various scenarios are not consistent in their assumptions. The Gannett Fleming cost estimates for annual O&M costs on Alternatives 3-6 assume that ground water, surface water, creek sediment, and creek biota would be monitored every six months, resulting in an annual cost of $150,000. The earlier Parson's cost estimates (and the Plan's estimate for Alternative 2) assume ground water would be monitored annually and the other media would be monitored only once during the initial sampling, resulting in a much lower annual cost.

EPA Response: Twice a year is the appropriate frequency of sampling for this Site during O & M. The monitoring of biota will have to continue indefinitely in order to determine when to take the fishing advisories signs down, and also to ensure that the remedy continues to protective of the nearby environment.

(l.) Contingencies, design, and oversight costs estimated by Gannett Fleming tend to be between 5 and 10 percent lower than what is typically experienced at Superfund sites and what was utilized by Parsons.

EPA Response: Gannett Fleming did the cost estimates properly, and in accordance with standard engineering practices. There is not set rule for adding an exact percentage to a cost figure as a contingency cost. This decision is a best professional judgement decision, and therefore can vary in different circumstances. Gannett Fleming added contingency costs of from 5-10%, and EPA agrees with their decision. Parsons tended to focus on worst-case scenarios rather than actual expected costs of the various components of the remedy.

(m.) Parson's cost estimates, based on conservative assumptions, indicate significantly higher costs for both Alternative 2 and Alternative 3. Notably, the cost of Alternative 3 is between $8 to $10 million more than Alternative 2, with a substantial contingency

dependent upon the the volume and cost of material requiring treatment.

EPA Response: Gannett Fleming's cost estimates are sound and are as accurate as possible at this stage of the remedial process. It is important to realize that, at this stage of the cleanup process, neither Parson's nor Gannett Fleming cost estimate can have a high degree of accuracy in predicting actual costs of any component of the remedy in future years. For example, in making an estimate of the cost of any component of the remedy, such as the multi-layer cap, there are so many unknown variables. We don't know the year the cleanup will take place, the number of companies interested in bidding on the work, or even the exact amount of cap materials needed for the consolidation pile. Some of the components of the selected remedy will cost less than what is estimated in the ROD, and some of the components will cost more than what is estimated in the ROD.

(n.) The final Plan must reflect realistic cost estimates, which take into full account the contingencies of the proposed work. All anticipated costs must be included in such estimates, with a consistent and complete recognition of contingencies, in order to provide a basis for a reasoned comparison between alternatives.

EPA Response: The cost estimates in this ROD are realistic. EPA feels that the costs are as accurate as possible at this stage of the remedial process. In general, the actual costs of any cleanup in future years may vary greatly from the cost estimates in the ROD. As stated in the Proposed Plan and the ROD, the actual cost for each alternative is expected to be in a range from 50% higher than the costs estimated to 30% lower than the costs estimated.

12. ARAR Issues

(a.) The Proposed Plan suggests that certain state hazardous waste facility citing requirements, contained in 25 Pa. Code °°269.22 23, 25, and 42 are ARARs regarding siting of the consolidation area. The Group submits that these siting criteria are not legally applicable in this situation. The Pennsylvania siting criteria are applicable to siting of new facilities. In this case, the remediation involves consolidation and capping of existing materials on the Site prior to adoption of the Pennsylvania facility siting criteria. However, the group would agree that the consolidation area should be placed out of the 100-year floodplain and should avoid wetlands.

EPA Response: These regulation are ARARs in this ROD. The consolidation area must be out of the floodplain, and should be on the abandoned portion of the Site so as not to interfere with scrap yard operations. Even if these regulations are not applicable, they could be relevant and appropriate.

(b.) The group supports the decision that liner requirements are either not applicable or should be waived in this situation.

EPA Response: EPA believes these regulations are an ARAR, but the regulations are being waived in this instance.

(c.) No mention is made in the Proposed Plan of the fact that the proposed excavation and offsite treatment and disposal of certain materials called for under Alternative 3 would be subject to Federal land ban regulations and the Plan contains no analysis of the impact of those standards on the cost and implementability of this option. In this regard, concern must be expressed regarding the impact of the Universal Treatment Standards on soils which may contain a mix of constituents, including not only lead and certain other metals, but also some other chemicals, such as organics. Unfortunately, virtually none of the authorized commercial hazardous waste treatment facilities in Pennsylvania permitted to treat inorganic materials have the capability of handling those materials if they contain more than de minimis concentrations of organics.

EPA Response: Gannett Fleming fully described the constituents and contamination levels of the waste at the Site in obtaining the price for transportation, treatment and disposal. Clean Harbors developed a price for that particular waste.

B. Comments of Eckert, Seamans, Cherin & Mellott on behalf of the Jacks Creek De Minimis Parties

In a one page letter dated April 28, 1997, Eckert, Seamans, Cherin & Mellott commented on behalf of the Jacks Creek De Minimis Settlement Participation Agreement Parties. The De Minimis Parties join in and support the "Jacks Creek PRP Group

Comments on Proposed Remedial Action Plan Jacks Creek Superfund Site," dated April 24, 1997.

C. Comments of McNees, Wallace & Nurick on behalf of Joe Krentzman & Son, Inc.

In a three page letter dated March 27, 1997, McNees, Wallace & Nurick commented on behalf of the owner of the Site property, Joe Krentzman & Son, Inc. (Krentzman).

(1.) The remedy should be designed in such a way that it minimizes to the fullest extent possible the disruption of Krentzman's ongoing operations at the Site. No remedy should be selected which interferes with Krentsman's ability to continue operating at the Site. Moving operations completely off the Site would destroy Krentman as an ongoing concern.

EPA Response: EPA agrees and feels the remedy can and should be implemented with as little impact as possible to the onsite business.

(2.) If Krentzman is forced into bankruptcy as a result of the clean-up process, there will be a server disruption to the local community. Dozens of employees depend upon Krentzman for their livelihood. Krentzman also provides a needed and environmentally sound service to the community by recycling scrap materials that would otherwise take up valuable disposal resources and cause the depletion of scarce natural resources. Krentzman's operations are not threatening the environment or neighbors and should be allowed to continue in an isolated rural setting, away from population centers.

EPA Response: EPA agrees and also believes that Krentzman can remain in business onsite during and after the onsite cleanup.

3.) The Proposed Plan states that certain site soils and waste piles will be consolidated on the "unused portion of the Site." The plan does not specify where a cap will be placed on the consolidated materials, nor how the placement of the cap will limit Krentzman's operations.

EPA Response: The exact size and location of the consolidated area must be outside of the floodplain areas and on the portion of the property not currently used.

(4.) The Proposed Plan discusses backfilling excavated areas to "original grade" without defining that term, and refers to "revegetation," which may be inappropriate for some or all areas of an industrial facility.

EPA Response: The scrap yard will not be revegetated, although, much of the area will be remediated and then backfilled with clean soil.

(5.) There is no discussion of how Krentzman's operations will be restricted, if at all, on areas where clean soils will be placed.

EPA Response: Krentzman's operations will not restricted on backfilled areas. There will be restrictions in the consolidation area after the multi-layer cap is in place.

(6.) The Proposed Plan references the demolition of onsite buildings, but Krentzman uses several buildings at the facility for its ongoing operations. These buildings are an integral part of Krentzman's operations and cannot be demolished, at least without replacement.

EPA Response: Onsite buildings will be demolished, however, none of the buildings which Krentman currently uses will be demolished.

(7.) The Proposed Plan notes that an eight-foot high fence will be constructed on the northern side of the active scrap yard. Such a fence must be placed so as to not interfere with scrap yard operations, such as the unloading of railroad cars, which is performed in the general vicinity.

EPA Response: The fence will be built so that it does not interfere with railroad operations. During the Remedial Design portion of the cleanup process, all of these factors will be taken into consideration in designing the fence.

(8.) The plan references stormwater controls related to capped areas but does not discuss how those controls would be integrated into ongoing operational controls.

EPA Response: There will be only one capped area onsite after the cleanup. This area will be located on the unused portion of the Site and will not interfere with the onsite business.

The stormwater controls also will be located on the unused portion of the Site and will not interfere with the ongoing business. The purpose of the storm water controls is to keep storm water from getting on to the consolidated area.

D. Comments of the Pennsylvania Department of Environmental Protection

In a three page letter dated April 25, 1997, the Pennsylvania Department of Environmental Protection commented on the Proposed Plan for the Site. The Department remarked that their comments on the draft Proposed Plan for the Site, as stated in a letter dated February 25, 1997, have not been incorporated into the final Proposed Plan. Concerns presented in this section were placed into the following categories:

1. Comments Specific to Alternative 3
2. Action-Specific ARARs

1. Comments Specific to Alternative 3

(a.) A description of cap materials needs to be given for the Multi-layer Cap Section. For a hazardous waste landfill, 25 PA Code, Chapter 263, Appendix E, Table 3 lists the Minimum Liner Design and Performance Standards which must be included as an ARAR.

EPA Response: A description of the different layers of the cap is included in the ROD on page 14. The cap is a multi-layer cap consisting of a number of different layers. First the waste will be covered with a two-inch layer of crushed limeston. The barrier layer, which is a layer of high-density polyethylene (HDPE), is placed down, then is covered with a six-inch sand drainage layer. This is covered with 12 inches of protective soils, and six inches of topsoil.

(b.) What is to be done with the wooded areas where soil levels of lead may be greater than 1,000 ppm?

EPA Response: The large forested area on the northern side of the Site is well below 1000 ppm lead, and will be left alone. However, there are several smaller woooded areas on other portions of the Site which do contain lead above 1,000 ppm. These areas would be excavated, consolidated with the other materials, an capped. All onsite soils with lead concentrations above 1,000 ppm and below 40,000 ppm would be consolidated in this manner. Clean soils then would be placed and seeded in these areas.

(c.) It can be inferred that wetlands which occur in the floodplain also will be covered with 18 inches of clean soil, eliminating much of the wetlands area. It is the Department's position that, if necessary, the wetland areas be excavated and restored with clean soil to the original grade and revegetated. Additional wetlands can be created as an aid in soil and erosion control.

EPA Response: There are two small wetland areas located onsite which combined are less than 0.20 acres. Both of these areas contain lead above 1000 ppm. These areas will be excavated, covered with clean soil and recreated as part of the selected remedy. Although there are other floodplain areas which will be covered with 18 inches of topsoil, these other floodplain areas are not wetlands.

(d.) Buildings on the Site that are contaminated cannot simply be disposed offsite unless the debris is characterized and, based on the characterization, is sent to a hazardous waste or residual waste landfill. Wastes generated from the cleaning of the buildings should be characterized, handled appropriately, and sent to an appropriate facility.

EPA Response: During the actual cleanup, the building debris will be handled in exactly this manner as part of the selected remedy.

(e.) There is no section in Alternative 3 that summaarizes activities regarding ground water. On page 8 of the proposed plan, a perched leachate area is listed beneath the Ball Mill Tailings Pile. This paragraph also states that this water is very contaminated with heavy metals. Since contamination is present and this leachate will be disturbed during earth moving activities, ground water disturbance and containment must be addressed.

EPA Response: Although the ground water is not being treated in the selected remedy, the ground water is being monitored. The water within the Ball Mill Tailings Pile will be contained when the pile is in the process of being consolidated.

(f.) EPA should provide a figure showing the proposed location of the capped area.

EPA Response: The exact size and location of the consolidation area will be determined during the Remedial Design. Figures and drawings showing the proposed loacation and other details of the consolidation area will be included in the Remedial Design documents.

(g.) Jacks Creek and the ara adjacent to the creek's floodplain are under the jurisdiction of the Department's Bureau of Dams, Waterways and Wetland Section. ARARs from 25 PA Code, Chapter 105, must be met. Chapter 105.13 pertains to the process of obtaining a permit for activities involving a floodplain. Although a permit is not required the basic requirements of such must be fulfilled. Additional ARARs pertaining to areas adjacent to the Creek include 25 PA Code, Chapter 105.17 and 105.18 (wetland regulations) and 25 PA Code, Chapters 105.261 and 105.271 (design criteria for modification of fills, levees, floodwalls, and streambank retaining devices).

EPA Response: Relevant portions of Chapter 105 are included in the ARARs section of this Record of Decision. Existing wetlands will be recreated as part of the selected remedy.

(h.) The protection of properties and waters including aquatic life also is an ARAR for this site. The Fish and Boat Code Act of October 16, 1980, P.L. 996, as amended, and 30 PA Code Sections 2502 and 1504 must be included as an ARAR.

EPA Response: EPA does not recognize this regulation as an ARAR.

2. Action-Specific ARARs

(a.) The control of storm water runoff during actions that disturb land, such as grading or excavating, must meet construction criteria consistent with the county watershed management plan and the Storm Water Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. Sections 680.1-680.17.

EPA Response: Relevant portions of this regulation are included in the ARARs section of the ROD.

(b.) Postclosure care and use of property are addressed under 25 PA Code, Chapter 264.117. This is an ARAR for the capped area. As the remedy calls for a hazardous waste landfill, 25 PA Code, Chapter 264.310, which also pertains to closure, is an ARAR. Specifically, 264.310 subsection (6)(iv) requires maintaining and monitoring the ground water monitoring system and complying with all other applicable requirements of Subchapter F (relating to ground water monitoring).

EPA Response: Relevant provisions of both 264.117 and 264.310 are included in the ARARs portion of this ROD on page 18.

(c.) The Department continues to assert the Pennsylvania Land Recycling Act as an ARAR, including the standards set forth in the Pennsylvania Land Recycling Technical Manual, Appendix B.

EPA Response: Provisions of regulations issued pursuant to the Pennsylvania Land Recycling Act have been identified as ARARs by EPA where deemed necessary.

<IMG SRC 97987D>

Pennsylvania Department of Environmental Protection
One Ararat Boulevard
Harrisburg, PA 17110-9333

September 29,1997

717-540-5012
Southcentral Regional Office FAX 717-657-4446

Mr. Abraham Ferdas, Acting Director 3HW00
Hazardous Waste Management Division
US EPA, Region III
841 Chestnut Street
Philadelphia, PA 19107-4431

Re: Record of Decision (ROD)
Jack's Creek Superfund Site
Decatur and Derry Townships
Mifflin County, PA

Dear Mr. Ferdas:

The Record of Decision (ROD) for the Jack's Creek Superfund Site, Decatur and Derry Townships, Mifflin county, was received September 25, 1997, with an additional amendment received September 29, 1997. It has been reviwed by the Department of Environmental Protection (DEP).

The selected remedy for this site consists of the following major components:

Soils with lead concentrations above 40,000 parts per million (ppm) which are the principal threat wastes, shall be excavated and treated at an off-site hazardous waste treatment facility using a chemical stabilization process.

Soils and waste pile materials with lead concentrations between 1,000 and 40,000 ppm lead shall be excavated and then consolidated on-site. Sediments from depositional areas of Jack's Creek exceeding 110 ppm lead in the immediate vicinity of the Site shall be removed from the creek by vacuum dredging, and then consolidated with the waste piles and contaminated soils.

The consolidated soils, waste materials and sediments shall be covered with a layer of crushed limestone, and then covered with a multi-layer cap.

All excavated areas shall be covered with clean fill to the original grade and then revegetated. All of the areas, except for the scrap yard shall be revegetated.

The existing on-site wetlands, which combined are approximately 1/5 of an acre in size, will be recreated in an on-site location.

Buildings that are structurally unsound shall be demolished.

Long-term monitoring of the ground and surface water, as well as the fish and benthos in Jack's Creek, shall be done as part of the operation and maintenance of the Site.

Deed restrictions would also be placed on a portion of the Site to restrict use of the capped area, and to limit other areas of the Site to industrial activities.

DEP herby concurs with EPA's proposed remedy with the following conditions:

- EPA will assure that DEP is provided an opportunity to fully participate in any negotiations with responsible parties.

- DEP will be given the opportunity to review and comment on documents and concur with decisions related to the design and implementation of the remedial action, to assure complaince with Pennsylvania's Applicable or Relevant and Appropriate Requirements (ARARs).

- DEP's posture is that its design standards are ARARs pursuant to SARA Section 121, and we will reserve our right to enforce those design standards.

- DEP reserves its right and responsibility to take independent enforcement actions pursuant to state law.

- This concurrence with the eselected remedial action is not intended to provide any assurances pursuant to SARA Section 104(c)(3).

- Public comment and the issurance of an Explanation of Significant Differences (ESD) must occur before any modification of the ROD.

Thank you for the opportunity to comment on this EPA Record of Decision. If you have any questions regarding this matter, please contact me at 717-541-7969.

<IMG SRC 97087E)

Karen Bassett
Acting Regional Director

EPA/ROD/R03-01/589
2001

EPA Superfund
Record of Decision:

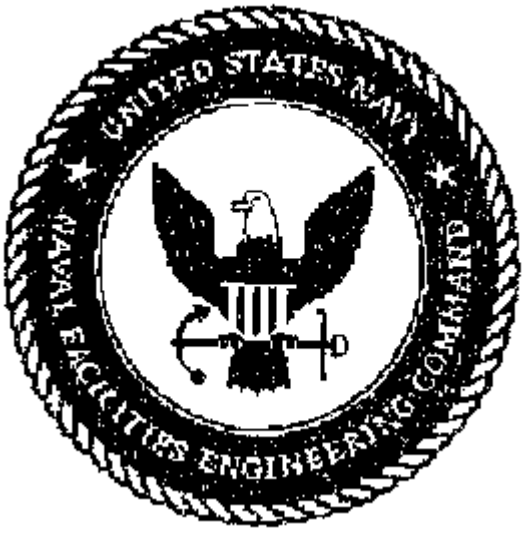
NORFOLK NAVAL BASE (SEWELLS POINT NAVAL COMPLEX)
EPA ID: VA6170061463
OU 02
NORFOLK, VA
12/06/2000

Record of Decision

NM Slag Pile

Naval Station Norfolk

Norfolk, Virginia



Department of the Navy

Atlantic Division

Naval Facilities Engineering Command

Norfolk, Virginia

October 2000

Table of Contents

Section **Page**

Acronyms and Abbreviations ..... **v**

1.0 Declaration **1-1**
1.1 Site Name and Location 1-1
1.2 Statement of Basis and Purpose 1-1
1.3 Assessment of the Site 1-1
1.4 Description of the Selected Remedy 1-1
1.5 Statutory Determinations 1-2

2.0 Decision Summary **2-1**
2.1 Site Name, Location, and Description 2-1
2.2 Site History and Enforcement Activities 2-1
2.2.1 Site History 2-1
2.2.2 Previous Investigations 2-4
2.2.3 Enforcement Actions 2-5
2.2.4 Highlights of Community Participation 2-6
2.3 Scope and Role of Response Action at Site 2 2-6
2.4 Summary of Site Characteristics 2-9
2.4.1 Sources of Contamination 2-10
2.4.2 Description of Contamination 2-10
2.4.3 Contaminant Migration 2-13
2.5 Summary of Site Risks 2-14
2.5.1 Summary of Human Health Risks 2-14
2.5.2 Summary of Ecological Evaluation 2-17
2.6 Description of Remedial Alternatives 2-19
2.6.1 Subsurface Soil Remedial Alternatives 2-19
2.6.2 Groundwater Remedial Alternatives 2-20
2.6.3 Sediment and Surface Water Remedial Alternatives 2-20
2.7 Summary of the Comparative Analysis of Alternatives 2-26
2.7.1 Threshold Criteria 2-26
2.7.2 Primary Balancing Criteria 2-28
2.7.3 Modifying Criteria 2-30
2.7.4 Comparative Analysis of Subsurface Soil Alternatives 2-30
2.7.5 Comparative Analysis of Groundwater Alternatives 2-37
2.7.6 Comparative Analysis of Sediment and Surface Water Alternatives 2-44
2.8 The Selected Remedy 2-50
2.8.1 Selected Subsurface Soil Remedy 2-50
2.8.2 Selected Groundwater Remedy 2-50
2.8.3 Selected Sediment and Surface Water Remedy 2-52
2.8.4 Performance Standards 2-54
2.9 Statutory Determinations 2-56
2.9.1 Overall Protection of Human Health and the Environment 2-57

Table of Contents (Continued)

Section **Page**

2.9.2 Compliance with Applicable or Relevant and Appropriate Requirements 2-57
2.9.3 Cost-Effectiveness 2-57
2.9.4 Use of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable 2-58
2.9.5 Preference for Treatment as a Principal Element 2-58
2.10 Documentation of Significant Changes 2-58

3.0 Responsiveness Summary 3-1
3.1 Overview 3-1
3.2 Background on Community Involvement 3-2
3.3 Summary of the Comments Received During the Public Comment Period and Agency Responses 3-2
4.0 References 4-1

Appendices

A Location- and Action-Specific Applicable or Relevant and Appropriate Requirements
B Final Remedial Investigation Results
C Summary of Media-Specific Human Health Risks and Hazards

Table of Contents (Continued)

Tables **Page**

2-1 Preliminary Remediation Goals 2-7

2-2 Summary of Field Investigation Results 2-11

2-3 Summary of Subsurface Soil Remedial Alternatives 2-21

2-4 Summary of Groundwater Remedial Alternatives 2-23

2-5 Summary of Sediment and Surface Water Remedial Alternatives 2-24

2-6 Glossary of Evaluation Criteria 2-27

2-7 Summary of Comparative Analysis of Subsurface Soil Alternatives 2-31

2-8 Summary of Comparative Analysis of Groundwater Alternatives 2-38

2-9 Summary of Comparative Analysis of Sediment and Surface Water Alternatives 2-46

Figures

2-1 Installation Location Map 2-2

2-2 Site Map 2-3

2-3 The Limits of the Soil and Asphalt Cover 2-51

2-4 Approximate Limits of Sediment Excavation, Area of Bank Stabilization, and Monitoring Locations 2-53

This Page Intentionally Left Blank

Acronyms and Abbreviations

AWQC	ambient water quality criteria
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BTAG	Biological Technical Assistance Group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	*Code of Federal Regulations*
COC	chemical of concern
COPC	chemical of potential concern
CRPC	Community Relations Plan
4,4'-DDD	dichlorodiphenyldichloroethane
4,4'-DDE	dichlorodiphenyldichloroethene
EPA	U.S. Environmental Protection Agency
ERA	ecological risk assessment
ERM	effects range-median
FFA	Federal Facilities Agreement
FS	Feasibility Study
HI	hazard index
HQ	hazard quotient
IAS	Initial Assessment Study
IR	Installation Restoration
LOAEL	lowest observed adverse effect level
LUC	land use control
LUCIP	land use control implementation plan
MCL	maximum contaminant level
MOA	memorandum of agreement
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
µg/L	micrograms per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NM	naval magazine

Acronyms and Abbreviations (Continued)

NOAEL	no observed adverse effects level
NPL	National Priorities List
NPW	net present worth
NSN	Naval Station Norfolk
O&M	operation and maintenance
PAH	polynuclear aromatic hydrocarbons
ppb	parts per billion
ppm	parts per million
PRAP	Proposed Remedial Action Plan
PRG	preliminary remediation goal
RAB	Restoration Advisory Board
RAO	remedial action objective
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RI	remedial investigation
ROD	record of decision
SARA	Superfund Amendments and Reauthorization Act of 1986
TBC	to be considered
TCE	trichloroethylene
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbons
VDEQ	Virginia Department of Environmental Quality

1.0 Declaration

1.1 Site Name and Location

NM Slag Pile — Site 2
Naval Station Norfolk
Norfolk, Virginia

1.2 Statement of Basis and Purpose

This record of decision (ROD) presents the selected remedy for the Naval Magazine (NM) Slag Pile - Site 2, located at the Naval Station Norfolk (NSN), Norfolk, Virginia. The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The information supporting the decision on the selected remedy is contained in the administrative record file for the NM Slag Pile Site.

The Commonwealth of Virginia concurs with the selected remedy.

1.3 Assessment of the Site

Actual or threatened releases of hazardous substances from Site 2, if not addressed by implementing the remedial actions selected in this ROD, may present an imminent and substantial endangerment to public health, public welfare, or the environment.

1.4 Description of the Selected Remedy

The remedy for NM Slag Pile — Site 2 is part of a comprehensive environmental remediation being conducted at the NSN under the Navy Installation Restoration Program. The selected remedy in this ROD is the permanent remedy for controlling contaminated soil, groundwater, surface water, and sediment at NM Slag Pile — Site 2. The major components of the selected remedy include the following:

- Placing an asphalt and soil cover over the entire slag pile to reduce exposure to site contaminants and provide for suitable reuse as a parking lot area.
- Institutional controls to limit future site land use. Institutional controls will prohibit 1) future excavation or disturbance of the covered area within Site 2; 2) the use of groundwater underlying Site 2 for drinking water: and 3) any other action on Site 2 that

would disturb the integrity of the asphalt and soil cover or disturb the function of the groundwater monitoring systems.

- Long-term groundwater monitoring for inorganics on an annual basis for five years, and once every five years thereafter.

- Excavating approximately 1,000 cubic yards of contaminated sediment in the drainage channel adjacent to the slag pile to achieve a cleanup level of 218 milligrams per kilogram (mg/kg) for lead, dewatering the excavated sediment, and transporting and disposing of the excavated sediment off-site. If a minimum of two feet of sediment has been excavated and the lead cleanup level cannot be achieved the drainage channel bed will be covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill to prevent future migration of sediment.

- Stabilization of the west bank of the drainage channel immediately adjacent to the slag pile area to prevent soil erosion from the slag pile into the drainage channel.

- Monitoring the sediment and surface water in the drainage channel for inorganics on an annual basis for five years.

1.5 Statutory Determinations

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to this remedial action, and is cost-effective.

The remedy addresses the remediation of subsurface soil, groundwater, surface water, and sediment at the site. The asphalt and soil cover will reduce direct contact and ingestion threats from contaminated soil and reduce possible leaching and erosion of soil contaminants to the groundwater and adjacent drainage channel. Removing contaminated sediment from the drainage channel will reduce risks to ecological receptors from contaminated sediment.
Remediation of Site 2 sediment will result in a reduction of contaminant levels in the surface water since surface water in the drainage channel no longer will come into contact with contaminated sediment.

The selected remedy uses permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable at Site 2. The selected remedy does not satisfy the statutory preference for remedies using, as a principal element, treatment that permanently and significantly reduces the toxicity, mobility, or volume of the hazardous substances, pollutants, or contaminants. The selected remedy represents a better balance of tradeoffs under the evaluation criteria than the alternatives using treatment. The large volume of contaminated soil led to treatment alternatives for the subsurface soil that were not cost-competitive with the selected remedy. Alternative 4 for sediment and surface water, which includes treating contaminated sediment by phytoremediation, was not selected for sediment remediation because arsenic, dichlorodiphenyldichloroethane (4,4'-DDD), and dichlorodiphenyldichloroethene (4,4'-DDE) cannot be treated through phytoremediation.

Because the remedy will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted no less often than every 5 years after the remedial action is initiated to ensure that the remedy continues to provide adequate protection of human health and the environment.

Steven W. Johnson, CAPT, CEC, USN
Regional Engineer
By direction of the Commander
Navy Region Mid-Atlantic

11/30/00
Date

Abraham Ferdas, Director
Hazardous Site Cleanup Division
U.S. EPA Region III

12/6/00
Date

This Page Intentionally Left Blank

2.0 Decision Summary

2.1 Site Name, Location, and Description

This ROD presents the U.S. Department of the Navy's (Navy) selected remedy for Site 2 – Soil, Groundwater, Sediment, and Surface Water at the NM Slag Pile, NSN, Norfolk, Virginia.

Site 2 is located in the southeast corner of NSN near the intersection of Interstate-64 (I-64) and Interstate-564 (I-564) (Figure 2-1). The site covers an area of approximately 2 acres (Figure 2-2) and is bordered by Patrol Road to the southwest, the fenced NM Van Facility to the southeast, and a fenced weapons storage area to the northeast.

As indicated in the NSN Land Use Plan, Site 2 is broadly classified as open space. Site 2 is located within a broad open area adjacent to a remnant pine forest. The proposed land use through the year 2010 is an open space retained to define a buffer zone around the weapons area (Naval Base, Norfolk, 2010 Land Use Plan, August 1995). The weapons area is a magazine area for the NSN where ordnance is stored. Activities surrounding the weapons area are restricted by barbed wire fencing, armed guards, and other security measures.

The drainage channel adjacent to the slag pile conveys water from I-564, adjacent railroad tracks, residential and commercial areas in the upstream watershed, and the shallow water table aquifer underlying the site, as well as stormwater runoff fro m the slag pile area.
Stormwater drainage from the site flows eastward and northward to the drainage channel.
Downstream of the site, this channel intersects another channel flowing in a perpendicular direction. This downstream channel generally collects water from the weapons storage area, I-64, and off-site residential and commercial areas. These channels combine and flow northwesterly and then northeasterly toward Mason Creek. This channel then is connected to Mason Creek through a dual 30-inch pipe culvert under Patrol Road located north of the weapons area. Mason Creek is, in turn, connected to Willoughby Bay through a large culvert that runs under the northeast corner of the NSN.

2.2 Site History and Enforcement Activities

The history of the site, previous site investigations, and highlights of community participation are summarized below.

2.2.1 Site History

Site 2 was used for disposing of slag generated by aluminum smelting operations conducted by the Navy during the 1950s and 1960s in the NM area of what was formerly known as the Naval Air Station. The slag is a residual cindery material derived from a blast furnace. Slag

LEGEND

INSTALLATION PROPERTY BOUNDARY

Figure 2-1
INSTALLATION LOCATION MAP
Naval Station, Norfolk

CH2M HILL

30-AUG-1999 B6521096.drv

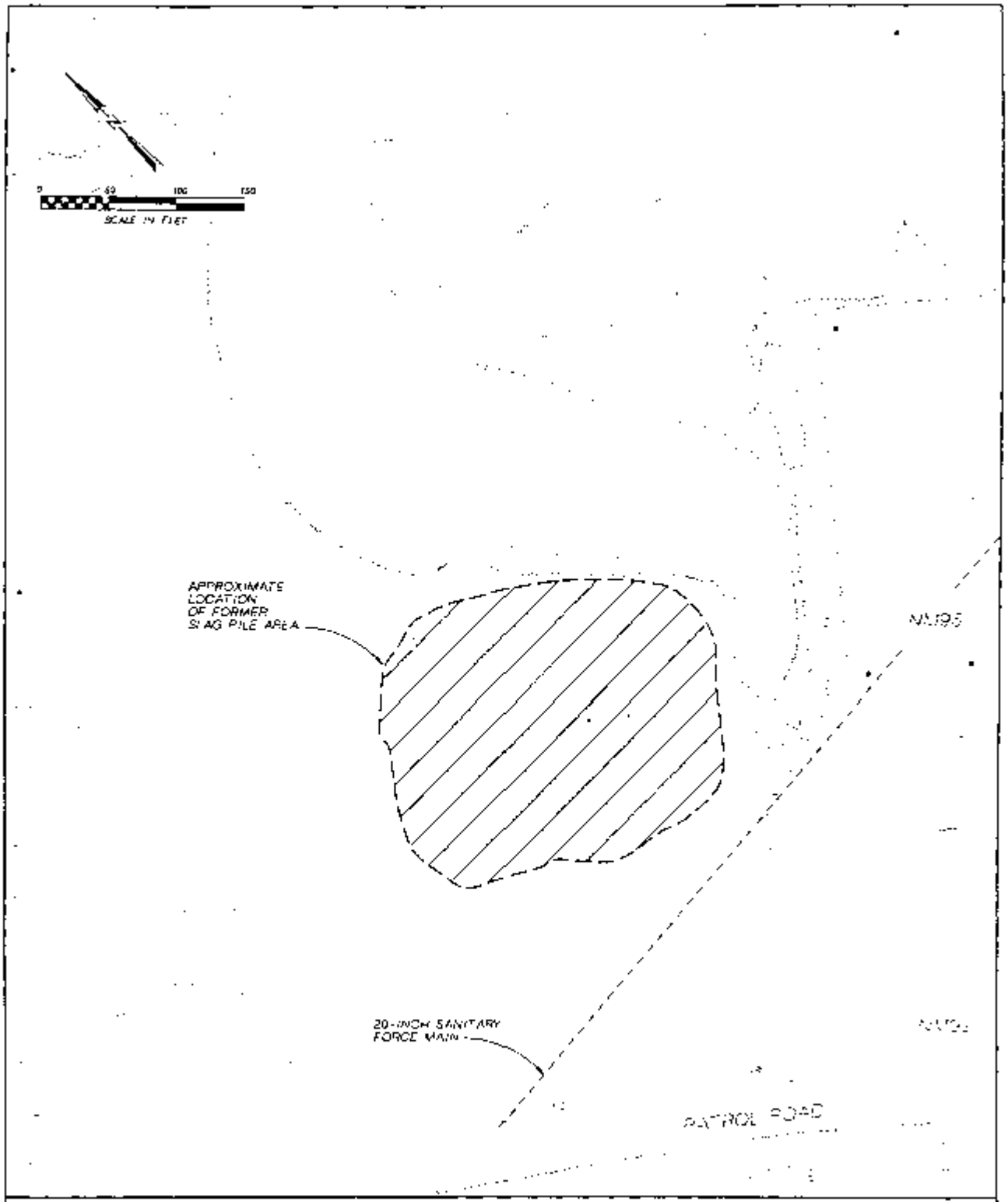


Figure 2-2
SITE MAP
SITE 2 - NM AREA SLAG PILE
Naval Station, Norfolk

24-AUG-2000 86321097.drv

is formed from the fusion of a mineral such as limestone (used to lower the fusion temperature of an ore mineral) with impurities from the aluminum ore and ash from the blast furnace fuel (likely to be coke). To create a level area upon which the slag-could be deposited, fly ash and/or bottom ash, derived from coal burning operations elsewhere on the NSN, apparently were used as a fill material for Site 2.

During the smelting operation, the slag pile area was well-defined by a lack of vegetation around the site and by the slag pile itself, which consisted of rounded slag and pieces of various metals. The surface of the site subsequently has been regraded and planted. Now, part of the former slag pile area is covered by a gravel parking lot. This parking lot is being used daily by 30 to 40 employees of the NM Van Facility (buildings NM 92 and NM 95 and surrounding facilities). The site is adjacent to the NM Van Facility, which provides maintenance and repair of mobile offices and equipment storage units.

2.2.2 Previous Investigations

The following studies of Site 2 have been conducted:

- *Initial Assessment Study of the Sewell's Point Naval Complex, Norfolk, Virginia* (IAS), (Environmental Science and Engineering, Inc. [ESE], February 1983)
- *Installation Restoration Program Remedial Investigation—Interim Report, Naval Base, Norfolk, Virginia* (IRP RI), (Malcolm Pirnie, Inc., March 1988)
- *Revised Final Phase II RCRA Facility Assessment of the Norfolk Naval Base—Sewell's Point, Norfolk, Virginia,* (A.T. Kearney, Inc., March 1992)
- *Final Remedial Investigation of the NM Slag Pile, Naval Base Norfolk, Norfolk, Virginia* (RI), (CH2M HILL, August 1998); and *Addendum to Master Project Plan for Pre-Design Investigations, NM Slag Pile (Site 2) and Pesticide Disposal Site (Site 5), Naval Base, Norfolk, Virginia,* (March 1998)
- *Final Feasibility Study, NM Slag Pile, Naval Base Norfolk, Norfolk, Virginia* (FS), (CH2M HILL, September 1998)

In April 1982, an IAS was conducted at the Sewell's Point Naval Complex, Naval Station Norfolk. The IAS identified 18 sites of concern with regard to potential contamination. The NM Slag Pile was included as a potential area of concern. The IAS report, completed in February 1983, documented that the slag pile at Site 2 was a potential source of surface stormwater and groundwater contamination because of potential leaching through the soil and overland flow or downward migration of metals, primarily chromium, cadmium, and zinc, into the water table aquifer.

The 1988 IRP RI included an investigation at Site 2 to determine if suspected inorganic constituents (metals) identified in the IAS report were present in the site soil and surface water within the stormwater drainage channel adjacent to the site. Analytical data indicated that cadmium, chromium, copper, lead, nickel, and zinc were significantly higher in the soil

at the slag pile than at the background sample location (a location that is unaffected by Site 2 activities). Analyses of surface water samples indicated no evidence of inorganic constituents entering the surface water; however, sediment samples collected in the same location indicated that inorganic constituents associated with the slag pile had eroded into the drainage channel and had been transported downstream. Recommendations included leveling and covering the slag pile with a hard surface to minimize the potential for continued erosion (after conducting additional sampling to identify specific areas to be covered) and implementing erosion-control measures to prevent erosion of sediment located between the cover and the drainage channel. The report also stated that removal actions were not warranted.

The purpose of the Phase II Resource Conservation and Recovery Act (RCRA) Facility Assessment, conducted in 1992, was to conduct a preliminary review of available and relevant documents, conduct visual inspections, and, if appropriate, conduct sampling visits. Recommendations for Site 2 included conducting soil and sediment sampling for metals analyses to determine if a release of hazardous substances or wastes had occurred.

The results of the previous investigations guided the scoping of the RI, completed in 1998.
The RI was completed in three separate phases of sampling. Soil, sediment, groundwater, and surface water samples were collected. The results of the RI are presented later in this document, and this information was used as the basis for the FS, completed in 1998, that identified and evaluated potential remedial alternatives for the site. The results of the FS also are presented later in this document, and this information was used as the basis for the Proposed Remedial Action Plan (PRAP).

2.2.3 Enforcement Actions

The NSN was placed on the National Priorities List (NPL) on April 1, 1997.

A Federal Facilities Agreement (FFA) was signed by the Deputy Assistant Secretary of the Navy on February 11, 1999, and by the Regional Administrator of EPA Region III on February 18, 1999. This agreement is intended to meet the provisions of CERCLA, 42 U.S.C. Section 9601 et seq., and Sections 3004(u) and (v) and 3008(h) of the Resource Conservation and Recovery Act (RCRA), as amended, 42 U.S.C. Sections 6924(u) and (v) and 6928(h). As described in paragraph 4.1 of the FFA, the general purposes of the agreement are to accomplish the following:

A. Ensure that the environmental impacts associated with the past and present activities at Site 2 are investigated thoroughly and that the appropriate remedial action is taken as necessary to protect public health, public welfare, and the environment.

B. Establish a procedural framework and schedule for developing, implementing and monitoring appropriate response actions at Site 2 in accordance with CERCLA as amended by SARA, the NCP, Superfund guidance and policy, RCRA, RCRA guidance and policy, and applicable state law.

C. Facilitate cooperation, exchange of information, and participation of the parties in such actions.

The FFA identifies 10 Installation Restoration (IR) sites, four site screening areas (SSAs), and eight areas of concern (AOCs) at NSN that are to be addressed by the Navy. Site 2 is included as one of the IR sites warranting investigation.

2.2.4 Highlights of Community Participation

The RI (August 1998), FS (September 1998), and PRAP (January 1999) for Site 2 have been released and made available to the public in the administrative record file at the Kirn Memorial Branch of the Norfolk Public Library in Norfolk, Virginia, and at information repositories maintained at the Naval Station Library and at the Mary Pretlow Branch of the Naval Station Library.

The notice of availability of the RI, FS, and PRAP was published in the *Virginian Pilot* on December 28-30, 1998. A public comment period for these documents was held from December 28, 1998, to January 28, 1999.

No written comments were received during the comment period. A public meeting was conducted on Thursday, January 21, 1999, at the Navy Lodge in Norfolk, Virginia. No one from the local community attended the meeting and no comments or questions were raised.

2.3 Scope and Role of Response Action at site 2

The selected remedy identified in this ROD addresses all contaminated media of concern at the site as identified in the RI and FS reports, and composes the overall cleanup strategy for the site. In Section 2.8, the selected remedy for Site 2 is identified and the rationale for its selection is described.

The selected remedy will reduce the potential risk to human health and the environment associated with the subsurface soil, groundwater, sediment, and surface water. The remedy includes installing an asphalt and soil cover over the contaminated soil and excavating and disposing of contaminated sediment.

The remedy is consistent with the long-term remedial goals for Site 2. The asphalt and soil cover will prevent or minimize human health exposure to levels above health-based criteria of inorganic contaminants in the subsurface soil. The asphalt and soil cover also will help prevent degradation of groundwater quality by limiting downward percolation of precipitation (and thereby the potential for dissolved lead) into the water table aquifer at Site 2. Excavating and disposing of contaminated sediment, along with stabilizing the bank, will minimize the current risk to the ecological receptors posed by contaminated sediment at Site 2, and will prevent further migration of contaminated sediment from Site 2. In addition, remediation of Site 2 sediment will result in reduced contaminant levels in the surface water. Groundwater, sediment, and surface water monitoring will track contaminant migration over time. Land use restrictions will prohibit the future use of the Yorktown Aquifer as a potable

water source at the site and prohibit excavation or other disturbance of the soil and asphalt cover.

The selected remedy will comply with applicable or relevant and appropriate requirements (ARARs) and "to-be-considered" (TBC) criteria. ARARs and TBC criteria are federal and state environmental statutes that are either directly applicable or relevant and appropriate, or considered in developing and evaluating remedial alternatives at a particular site. Chemical-, location-, and action-specific ARARs have been evaluated for Site 2. Chemical-specific ARARs/TBCs are discussed below. Location- and action-specific ARARs for Site 2 are presented in Appendix A.

Soil — There are no Federal or Commonwealth of Virginia promulgated cleanup levels for contaminated soil. Because of this, human health preliminary remediation goals (PRGs) for soil were developed for the chemicals of potential concern (COPCs) under the construction worker scenario (presented in Table 2-1).

TABLE 2-1
Preliminary Remediation Goals
Construction Worker Scenario (Subsurface Soil)
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia[1]

Chemicals of Potential Concern	Recommended Soil PRG (mg/kg)	Maximum Concentration (mg/kg)
Aluminum	210,000	180,000
Antimony	**39**	**240**
Arsenic	64	18
Cadmium	**48**	**110**
Chromium	**96**	**1900**
Copper	**4,300**	**78,000**
Iron	**32,000**	**110,000**
Lead	**609[2]**	**9,820**
Nickel	**3,900**	**7,100**

[1] Shaded constituents represent inorganics with maximum concentrations that exceed their respective recommended soil PRGs.

[2] A lead screening level of 1,218 parts per million (ppm) (industrial scenario) was calculated based on adult worker exposure to lead in soil following current EPA guidance (EPA, 1996; see Section 4.0 References, below). However, since then, EPA has requested a higher ingestion rate be assumed, which results in the 609 ppm cleanup level.

Two chemicals, aluminum and arsenic, were selected as COPCs by the screening performed in the baseline human health risk assessment but have maximum concentrations less than their respective recommended soil PRGs. These chemicals are included in Table 2-1 only because they were COPCs and are not considered further because their PRGs were not exceeded. The maximum concentrations of antimony, cadmium, chromium, copper, iron,

lead, and nickel are greater than their perspective recommended soil PRGs and thus these COPCs were considered for response action in the Site 2 subsurface soil.

Lead is found in all soil samples and is the indicator parameter for the inorganics. Since it is co-located with other chemicals of potential concern, reduction of exposure to lead to acceptable levels is expected to reduce exposure to all other inorganic chemicals of potential concern to acceptable levels.

If the soil is classified as hazardous, then prohibitions on land disposal specified in 40 Code of Federal Regulations (CFR) Part 268, may apply.

Groundwater – The EPA has established a drinking water action level of 15 parts per billion (ppb) for lead, which will be the chemical-specific ARAR for groundwater at Site 2. The presence of elevated metals concentrations measured in unfiltered groundwater samples (versus those in filtered samples) usually is attributed to the presence of sedimentation in those samples. This is demonstrated by higher detected concentrations of metals in unfiltered samples than those in corresponding filtered samples. Risks potentially associated with exposures to unfiltered inorganics (total metals) and filtered inorganics (dissolved metals) were evaluated in the human health risk assessment under scenarios that best represented actual exposure conditions. Unfiltered groundwater samples were evaluated only for determining risks from accidental exposures to shallow groundwater during excavation and construction activities, and filtered groundwater samples were evaluated for determining risks from potable use of groundwater.

Although the action level for lead is exceeded in unfiltered groundwater at Site 2, the lead concentrations in the unfiltered groundwater from the site wells were not statistically different from the concentrations from the upgradient wells (using a one-tailed Mann-Whitney U test for an upper confidence level of 95 percent, and the Wilcoxon-Mann-Whitney Rank Sums test in the case of tied ranks). Because of this, remedial action at Site 2 alone would not reduce levels of lead in unfiltered groundwater at the site to the action level. If construction activities were to occur where exposure to lead in groundwater was possible, necessary precautions would have to be taken to prevent risk to a construction worker:

Sediment – Arsenic, cadmium, chromium, copper, lead, nickel, silver, zinc, 4,4'-DDD, and 4,4'-DDE were detected at concentrations that exceed the EPA Region III Biological Technical Assistance Group (BTAG) screening levels for sediment. Lead is the indicator parameter in sediment. Removal of lead to the established cleanup level also will remove the other elevated contaminants posing an ecological risk.

Guidance relevant to the lead contamination in sediment includes the effects range-median (ERM) for lead, or 218 mg/kg, dry weight (Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder, 1995). The ERM is the concentration of a contaminant in sediment at which adverse biological effects to living resources may be observed 50 percent of the time. Since ERM values are screening levels, they are classified as to be considered" (TBC) criteria. The TBCs are meant to complement ARARs, and not to compete with or replace them.

If the sediment is determined to be hazardous by characteristic, then prohibitions on land disposal specified in 40 CFR Part 268 may apply.

2.4 Summary of Site Characteristics

This section provides a summary of the features of the site, and of the nature and extent of soil, groundwater, sediment, and surface water contamination at the site.

Soil – The site geology was delineated based on the previously documented geologic information, and on RI boring logs, monitoring well installations, and direct-push soil sampling results. Typically, the upper five feet consists of medium-brown to orange-brown sandy fill with intermixed construction debris and ash material. The material from five feet to approximately 25 feet below ground surface (bgs) is composed of medium-brown to gray silty sands with occasional silty clay lenses. Based on one deep well located in the northern corner of the site, the lithology from 25 to 80 feet bgs is described as olive-gray, medium-coarse sand with occasional shell fragments.

Sediment – The drainage channel adjacent to the slag pile area contains sediment that consists of coarse to fine sand, silt, and silty clay, intermixed with organic debris. A medium-brown-to-gray silty sand underlies the sediment. Areas of the drainage channel with low-velocity flow or still water contain a deposit of watery mud mixed with organic matter that overlies the sediment.

Surface Water – The drainage channel adjacent to the slag pile area conveys water from I-564, adjacent railroad tracks, residential and commercial areas in the upstream watershed, and the shallow water table aquifer underlying the site, as well as stormwater runoff from the slag pile area. Stormwater drainage from the site flows eastward and northward to the drainage channel. Downstream of the site, this channel intersects another channel flowing in a perpendicular direction. This downstream channel generally collects water from the NSN weapons area, 1-64, and off-site residential and commercial areas. These channels combine and flow in a northwesterly direction toward Mason Creek.

Groundwater – Shallow groundwater flows in an east-northeasterly direction at Site 2. The shallow groundwater discharges into the drainage channel as surface water. The average groundwater table elevation derived from eight surveyed monitoring points is 6.13 feet above mean sea level. The Site 2 horizontal groundwater gradient ranges from 0.01 to 0.025. A vertical groundwater gradient exists between the shallow and deep aquifer as illustrated by the hydraulic head difference of 0.46 feet between a shallow monitoring well and its deep counterpart. Assuming that the hydraulic head distribution at this one pair of wells is indicative of conditions across the site, a downward component of groundwater flow also exists at the site.

A specific data quality objective concerning the hydrogeology of Site 2 during the 1998 RI involved determining the presence or absence of a confining unit separating the unconfined shallow aquifer from the underlying Yorktown Aquifer. One monitoring well was drilled with this objective in mind. No significant confining layer was observed in this monitoring

well. The observed thin lenses of silty clay in the 6-to-28-foot interval were not thick enough to be considered laterally continuous to any certain degree. In other areas of NSN, a confining clay layer (where present) ranges from 25 feet to approximately 40 feet bgs. The confining clay unit was breached possibly by scouring, a result of erosional forces associated with Mason Creek. This absence also could be the result of a variable, depositional, shallow marine environment (transgressing and regressing seas) or a combination of both.

2.4.1 Sources of Contamination

The primary source of contamination present at the site is ash material encountered in the subsurface soil of the slag pile area. The principal zone of metals contamination actually was found to be confined within ash beds of two inches to 2.5 feet in thickness and within zones of silty sand with intermixed ash. The principal media of contamination is interpreted as fly ash and/or bottom ash, derived from coal burning operations and that most likely had been used as general fill in the area of Site 2 to level the site for industrial use. The ash contains elevated concentrations of heavy metals, especially lead. The concentration range of lead in the subsurface soil was 7.2 mg/kg to 9,820 mg/kg. Some of the lead-contaminated soil has eroded into the adjacent drainage channel and has been transported downstream, resulting in sediment contamination. The ash in the slag pile area is in contact with the shallow groundwater. However, groundwater quality data indicate that the ash material has not contributed to groundwater contamination.

Residual pieces of slag material resulting from industrial use of the site were found primarily in the upper two inches of the soil profile. This finding indicates that the area was filled with fill material that included ash material to form a flat, elevated surface. The slag subsequently was piled on the elevated surface. The slag generated by aluminum smelting operations in the NM area of the former Naval Air Station and disposed of at Site 2 is no longer thought to be the principal source of lead contamination.

2.4.2 Description of Contamination

The chemicals detected in samples collected during the 1998 RI were mostly inorganics (e.g., lead), but some organics also were detected (e.g., 4,4'-DDD, 4,4'-DDE, trichloroethylene (TCE), and several polynuclear aromatic hydrocarbons (PAHs)). A summary of field investigation results and the standards and screening levels that they were compared with (using the most recent standards and screening levels at the time of the 1998 RI) are presented in Table 2-2 and are summarized below. Summary tables of regulatory exceedances for each media are contained in Appendix B.

Groundwater

Groundwater at the site was characterized by installing several permanent monitoring wells and collecting *in situ* groundwater at down-gradient locations between well locations, using a Geoprobe. To support risk assessment, the wells were sampled two times during the 1998 RI and one additional time after the 1998 RI was completed.

TABLE 2-2
Summary of Field Investigation Results
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Phase I Investigation Activity		Major Findings [1]
Phase I	Groundwater Sampling filtered)	Arsenic and trichloroethylene (TCE) exceeded risk-based concentrations (RBCs) for tap water. Thallium exceeded the maximum contaminant level (MCL). Iron, manganese, selenium, and zinc exceeded the Virginia Groundwater Standards.
	Surface Soil Sampling	Arsenic exceeded the RBC for industrial soil. Multiple inorganics exceeded BTAG screening levels, including aluminum, beryllium, chromium, copper, iron, lead, nickel, vanadium, and zinc. Several polynuclear aromatic hydrocarbons (PAHs) also exceeded BTAG screening levels.
	Subsurface Soil Sampling	Arsenic and beryllium exceeded the RBC for industrial soil. Lead exceeded the EPA action level for residential soil.
	Sediment Sampling	Several inorganics exceeded BTAG screening levels, including arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc. 4,4'-DDE also exceeded STAG screening level.
	Surface Water Sampling	Several inorganics exceeded BTAG screening levels, including aluminum, cadmium, copper, lead, silver, and zinc. Iron and lead exceeded ambient water quality criteria (AWQC).
Phase II Investigation Activity		**Major Findings [1]**
Phase II	Geophysical Surveys	Electromagnetic and ground-penetrating radar surveys helped to delineate the extent of lead-contaminated soil. The surveys revealed a more extensive boundary to the lead-contaminated area than what had been estimated originally as the slag pile area. The anomaly defined by the electromagnetic survey correlated well with the occurrence of lead-contaminated ash in the subsurface and is now interpreted to define the distribution of lead-contaminated ash. The ash material, rather than the slag, is the apparent source of elevated lead levels found at Site 2.
	Field XRF Screening	Subsurface soil was screened for total lead at 49 locations using a portable XRF. The lead-contaminated soil was located and characterized.
	Groundwater Sampling (filtered)	Arsenic, iron, and beryllium exceeded RBCs for tap water and thallium exceeded MCLs. Selenium and manganese exceeded Virginia Groundwater Standards.
	Surface Soil Sampling	One surface soil sample was collected and several inorganics exceeded BTAG screening levels, including aluminum, antimony, beryllium, cadmium, chromium, copper, iron, lead, nickel, silver, vanadium, and zinc.
	Subsurface Soil Sampling	Arsenic and beryllium exceeded the RBC for industrial soil. Lead exceeded the EPA action level for residential soil.
	Background Soil Sampling	Several inorganics exceeded BTAG screening levels, including aluminum, chromium, iron, lead, nickel, vanadium, and zinc.
	Sediment Sampling	Several inorganics exceeded BTAG screening levels, including arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc. 4,4'-DDD and 4,4'- DDE also exceeded BTAG screening level.
	Surface Water Sampling	Several inorganics exceeded BTAG screening levels, including aluminum, cadmium, lead, and silver. Iron and lead exceeded AWQC.
Phase III Investigation Activity		**Major Findings [1]**
Phase III	Sediment Sampling	Lead concentrations exceeded the cleanup level of 218 mg/kg in 9 out of 17 shallow sediment samples, 7 out of 10 mid-level sediment samples, and 3 out of 10 deep sediment samples. None of the samples collected in the weapons station drainage channel exceeded the cleanup level. Lead concentrations exceeded the cleanup level of 218 mg/kg in 9 out of 12 surface soil samples collected in the wooded wetlands area.

1 The analytical results were screened against the most recent standards and screening levels at the time of the 1998 RI.

Specifically, the groundwater analytical results were compared with EPA Region III risk-based concentrations (RBCs) for tap water, Federal maximum contaminant levels (MCLs), and Virginia Groundwater Standards. Soil analytical results were compared with RBCs for industrial soil, BTAG screening levels for ecological concerns, and the EPA action level for lead. Sediment analytical results were compared with BTAG screening levels, and the ERM level for lead. Surface water analytical results were compared with BTAG screening levels, and ambient water quality criteria (AWQC).

Groundwater from Site 2 contained arsenic, iron, beryllium, and TCE at concentrations that exceeded RBCs for tap water (those in effect at the time the draft RI was submitted, September 1997) and thallium that exceeded the MCL. Selenium and zinc exceeded the Virginia Groundwater Standard. Arsenic and iron were detected at elevated concentrations in upgradient groundwater monitoring wells as well as in downgradient wells, indicating an off-site (and off-Station) source. The TCE was only detected one time in one well and was not detected in a subsequent sampling round. The RBC for beryllium was increased after the 1998 RI sampling was completed. At the concentrations detected, beryllium did not exceed the revised RBC. Thallium was detected in downgradient monitoring wells only, as a dissolved contaminant. However, each time it was detected in a monitoring well, the detection was qualified as being an estimated value. The final round of sampling yielded non-detections for thallium. Soil containing the ash material with elevated heavy metals had detections for thallium, selenium, and zinc but the detected values were below the RBC for ingestion of residential soil. Therefore, there is no indication that the presence of these inorganics in filtered groundwater is related to the metals-contaminated soil at the slag pile area.

EPA's drinking water action level for lead is 15 micrograms per liter (µg/L). Although this action level was exceeded in unfiltered groundwater at Site 2, the lead concentrations in the unfiltered groundwater from the site wells were not statistically different than the concentrations from the upgradient wells; therefore, remedial action at Site 2 alone would not reduce levels in unfiltered groundwater at the site to the EPA drinking water action level. In addition, Human Health Consensus Agreement No. 6.C states that unfiltered groundwater samples need to be evaluated only for determining risks from accidental exposures to shallow groundwater during excavation/construction activities, and not for evaluating risks from potable use of groundwater. If construction activities were to occur where exposure to lead in groundwater was possible, necessary precautions will have to be taken to prevent risk to construction workers.

Surface Water

Surface water samples were collected along the reach of the drainage channel upstream, adjacent to, and downstream of the slag pile area. The surface water samples were compared with ambient water quality criteria and BTAG screening levels. Iron and lead exceeded ambient water quality criteria. Several inorganics, including aluminum, cadmium, copper, lead, silver, and zinc, exceeded BTAG screening levels. Although groundwater discharges to surface water at the site, the 1998 RI groundwater sampling results for dissolved constituents in downgradient monitoring wells indicated that groundwater discharge to surface water was

not adversely affecting the surface water quality at the site. Therefore, removal of the sediment from the drainage channel in the vicinity of the slag pile area, as proposed, is expected to remediate any problems with the surface water.

Soil

Soil contamination was primarily characterized using Geoprobe soil sampling in a grid pattern within and surrounding an area that, using geophysical techniques, was characterized as anomalous. The soil sampling indicated that a fill material, characterized as an ash, was the source for elevated metals in the soil. Surface and subsurface soil samples also were collected during well installation. Soil sample results were compared with EPA Region III RBCs for ingestion of industrial soil.

In surface soil, arsenic exceeded the RBC for industrial soil. Multiple inorganics, including aluminum, beryllium, chromium, copper, iron, lead, nickel, vanadium, and zinc, exceeded BTAG screening levels. Several polynuclear aromatic hydrocarbons also exceeded BTAG screening levels.

In subsurface soil, arsenic and beryllium exceeded the RBC for industrial soil. Lead exceeded the EPA action level for residential soil. Installing an asphalt and soil cover over the contaminated area, as proposed, will restrict exposure to and transport of contaminated surface and subsurface soil.

Sediment

Sediment samples were collected at multiple depths along the reach of the drainage channel upstream, adjacent to, and downstream of the slag pile area. The sediment samples were compared with BTAG screening levels. Several inorganics, including arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc, exceeded BTAG screening levels. 4,4'-DDD and 4,4'-DDE also exceeded BTAG screening levels.

Lead concentrations exceeded the cleanup level of 218 mg/kg in nine out of 17 shallow sediment samples, seven out of 10 mid-level sediment samples, and three out of 10 deep sediment samples. None of the samples collected in the drainage channel adjacent to the weapons storage area exceeded the cleanup level. Lead concentrations exceeded the cleanup level of 218 mg/kg in nine out of 12 surface soil samples collected in the wooded wetlands area adjacent to the site.

The proposed sediment removal from the drainage channel will remediate the contamination. The BTAG reviewed the contamination in the wooded wetland adjacent to the site and determined that any attempts at removal would do more to destroy habitat than would leaving the sediment in place.

2.4.3 Contaminant Migration

The fate of most contaminants found at Site 2 is that they will remain in place bound to soil, sediment, and organic matter. Some transport of particulate-bound contaminants into the drainage channel adjacent to the site has occurred via surface runoff and erosion, as

evidenced by relatively high levels of inorganic contaminants detected in sediment and surface water. Most contamination that can be attributed to Site 2 is found within the site or adjacent to the site, in the drainage channel. The contamination detected in the sediment and surface water has resulted from erosion of soil adjacent to the drainage channel that contains the lead-contaminated ash material.

The overall rate of contaminant transport in the drainage channel is interpreted to be very slow. The most rapid mechanism for contaminant migration is via surface water, which transports particulate-sorbed contaminants toward Mason Creek. However, the extent of contamination in surface water and sediment that can be attributed to Site 2 is limited to a short distance downgradient from the site before dispersion lowers concentrations in the surface water and sediment to levels below established regulatory standards.

Phase I and II analytical results for surface water indicated evidence of temporal variability in inorganic contaminant concentrations (i.e., at one location, the concentration of lead in surface water decreased from 1,190 mg/L during Phase I to non-detection during Phase II). In addition, surface water samples were turbid, indicating that the lead contamination likely was caused by the sediment suspended in the stream flow. This interpretation is supported further by the absence of dissolved lead contamination in groundwater, which discharges to surface water in the drainage channel.

Groundwater quality data indicate that site contaminants are not dissolved in or transported by site groundwater. Although thallium was detected only in downgradient wells, thallium detections have been qualified as being estimated values, and the final round of sampling yielded non-detections for thallium. There is no indication that the presence of thallium in groundwater is related to contaminated soil at the slag pile. Lead was detected in unfiltered groundwater only, indicating that its presence in groundwater is in particulate (non-dissolved) form. Therefore, lead is not expected to migrate between the subsurface soil and groundwater. Elevated lead concentrations were detected in unfiltered samples from upgradient wells and from downgradient wells.

2.5 Summary of Site Risks

The public health and ecological risks associated with exposure to contaminated media at Site 2 were presented in the 1998 RI report. The public health baseline risk assessment evaluated and assessed the potential public health risks that might result under current and potential future land use scenarios. An ecological evaluation also was performed and assessed the ecological risks at Site 2. The public health and ecological risks associated with the site are summarized below.

2.5.1 Summary of Human Health Risks

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) established acceptable levels of carcinogenic risk for Superfund sites ranging from one excess cancer case per 10,000 people exposed to one excess cancer case per one million people exposed. This translates to a risk range of between one in 10,000 and one in one million additional

cancer cases. Expressed as scientific notation, this risk range is between $1x10^{-4}$ and $1x10^{-6}$. Remedial action is warranted at a site when the calculated cancer risk level exceeds $1x10^{-4}$.

The NCP also states that sites should not pose a health threat because of a noncarcinogenic, but otherwise hazardous, chemical. EPA defines a noncarcinogenic threat by the ratio of the contaminant concentration that a person may encounter at the site to the established safe concentration. If the ratio, called the hazard index (HI), exceeds 1.0, there may be concern for the potential noncarcinogenic health effects associated with exposure to the contaminants. The HI identifies the potential for the most sensitive individuals to be adversely affected by the noncarcinogenic effects of contaminants. As a general rule, the greater the value of the HI above 1.0, the greater the level of concern. Cancer risks and the potential to experience noncarcinogenic adverse effects as measured by the HI were evaluated in the risk assessment. Cancer risks were compared with the acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$. The calculated HI was compared with the threshold value of 1.0.

The baseline risk assessment evaluated potential exposures to current and future receptors. The receptors included the following:

- Current and future on-site workers (surface soil and groundwater)
- Current and future recreational adults and adolescents (surface water, surface soil, and sediment)
- Future construction workers (groundwater and subsurface soil)
- Future gardener and agricultural users (groundwater)
- Future downgradient hand-bay car wash users (groundwater)

The risk assessment indicates that past practices at Site 2 have contaminated certain media to the extent that they pose a potential threat to human health only under certain potential land use scenarios. A future residential scenario was not considered to be a complete pathway and, therefore, was not evaluated in this assessment. The results of the human health risk assessment for the various exposure scenarios are summarized below. Appendix C presents the summary of media-specific risks and hazards for each scenario evaluated.

Current and Future On-site Workers

The "current and future on-site worker" risk scenario was evaluated for on-site workers at the NSN who may contact surface soil and groundwater at the site. Results indicate that there are no unacceptable risks to current and future on-site workers posed by the surface soil and groundwater at Site 2.

Current and Future Recreational Adults and Adolescents

For the "current and future recreational adults and adolescents" scenario, it was conservatively assumed that adults and older children (ages seven to 15 years), who live in the vicinity of the site, may trespass onto the site and become exposed to site surface soil,

surface water, and sediment. As shown in Appendix C, there are no unacceptable risks to current and future recreational adults and adolescents posed by the surface soil, surface water, and sediment at Site 2.

Future Construction Workers

This exposure scenario was evaluated for future construction workers who may contact groundwater and subsurface soil during any future excavation and construction activities performed at the site.

After completing the baseline human health risk assessment for Site 2, EPA determined that beryllium no longer is classified as a carcinogen by the ingestion route. Beryllium no longer is a COPC; the maximum concentration detected in the subsurface soil samples does not exceed the EPA Region III industrial worker risk-based screening value. In addition, after completing the baseline human health risk assessment, the oral reference dose (RfD) for chromium increased from $3.0x10^{-3}$ to $5.0x10^{-3}$, which increases both the ingestion and dermal hazard quotients (HQs). The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure to the human population, including sensitive subpopulations, in which the exposure is likely to be without appreciable risk of deleterious effects during a lifetime. The HQ is the ratio of a single-substance exposure level over a specified period (e.g. subchronic) to a reference dose for that substance derived from a similar exposure period. The dermal HQ is an adjustment of the ingestion HQ.

The ingestion and dermal contact of subsurface soil exposure by the construction worker was included in the assessment because of the potential for future work to be performed on the sanitary force main that runs through Site 2. As shown in Appendix C, the ingestion of subsurface soil and dermal contact with subsurface soil by the construction worker (revised cumulative hazard index = 63) resulted in an HI above the EPA's recommended level of 1.0 for noncarcinogens. The cumulative media-specific risk to a construction worker exposed to the subsurface soil ($2.0x10^{-6}$) is within the EPA's target risk range of $1.0x10^{-6}$ to $1.0x\ 10^{-4}$ for carcinogens.

Aluminum, antimony, arsenic, cadmium, chromium, copper, iron, and nickel were selected as COPCs for the construction worker scenario because the maximum concentrations detected in the subsurface soil samples exceeded EPA Region III industrial worker risk-based screening values and the site concentrations were statistically greater than the background concentrations (using a one-tailed Mann-Whitney U test for an upper confidence level of 95 percent).

Future Gardener and Agricultural Users

This exposure scenario was evaluated for future gardener and agricultural users using groundwater for nonpotable uses such as lawn or plant watering. Appendix C presents the results of this scenario. Results indicate that there are no unacceptable risks to future gardener and agricultural users posed by the groundwater at Site 2.

Future Downgradient Hand-Bay Car Wash Users

This exposure scenario was evaluated for future downgradient hand-bay car wash users using groundwater for vehicle washing. Appendix C presents the results of this scenario. Results indicate that there are no unacceptable risks to future downgradient hand-bay car wash users posed by the groundwater at Site 2.

Human Health Risks from Lead

Lead was detected at a maximum concentration of 9,820 parts per million (ppm) in the subsurface soil, 3,900 ppm in the sediment, 71.4 ppb in the unfiltered groundwater (it was not detected in the filtered groundwater), and 1,190 ppb in the surface water. The EPA has established an action level of 15 ppb for lead in groundwater and a residential screening level of 400 ppm for lead in soil. Additionally, a lead screening level of 609 ppm was calculated based on adult worker exposure to lead in soil following current EPA guidance (EPA, 1996) and EPA's requested higher ingestion rate.

The lead levels detected in the unfiltered groundwater and subsurface soil at Site 2 exceed these EPA -derived levels. EPA, the Navy, and Virginia DEQ agreed that unfiltered groundwater samples are to be used for determining risks from accidental exposures to shallow groundwater during excavation/construction activities. Although the lead levels detected in the unfiltered groundwater at Site 2 exceed the drinking water action level of 15 ppb, there was no statistically significant difference between the lead concentration in the unfiltered groundwater from the site wells and the upgradient wells (using a one-tailed Mann-Whitney U test for an upper confidence level of 95 percent). Furthermore, lead was not detected in any of the filtered groundwater samples. In addition, filtered sample results are to be evaluated for determining risks from potable use of groundwater. Additionally, the City of Norfolk Health Department prohibits use of the groundwater from the water table aquifer for public or private potable water supplies under City ordinance Chapter 46.1, Reference 46.1-5.
The City of Norfolk supplies all potable water to the city and NSN, and there are no potable water supply wells at NSN. Therefore, the groundwater is not used as a potable source at NSN.

2.5.2 Summary of Ecological Evaluation

In addition to the human health risks identified for Site 2, an ecological risk assessment (ERA) was completed and documented in the 1998 RI report. The ERA considered the ecological effects from contaminated soil, surface water, and sediment. Groundwater data was not included because, from an ecological perspective at this site, exposure to contaminated groundwater is possible at locations where groundwater discharges to the surface as seeps or discharges into surface water or wetlands. The surface water, therefore, was used to represent contaminant levels in this media.

The ERA evaluated and analyzed the results from the 1998 RI, including sampling and chemical analysis of the media of concern. Potential ecological receptors were determined from observations during the 1998 RI, and from a habitat evaluation that was conducted to

identify potential aquatic and terrestrial ecological receptors. Contaminants detected were evaluated to determine if they posed a risk to aquatic or terrestrial receptors.

The overall list of identified contaminants was reduced to a list of COPCs. The COPCs are site-related contaminants used to estimate ecological exposures and potential adverse effects on the site receptors. The following criteria were used in selecting COPCs:

- Chemicals were compared with established Biological Technical Assistance Group benchmarks
- A benchmark HQ was calculated for each chemical analyzed at Site 2 by dividing the maximum concentration of contaminants detected in soil, sediment, and surface water by the corresponding lowest BTAG benchmark-screening values
- Any chemical having a benchmark HQ greater than 1.0 was designated as a COPC

EPA ecological risk assessment guidance (EPA 1997) was used to calculate risk. Exposure concentrations were compared with ecological endpoints, such as reproductive failure or reduced growth. For each receptor species, the maximum exposure concentration (dose) of each COPC was calculated, based on species-specific information. The dose then was divided by the no-observed-adverse-effects level (NOAEL) and the lowest-observed-adverse-effect level (LOAEL) to calculate the NOAEL HQ and the LOAEL HQ, respectively. The NOAEL is the highest level of a contaminant evaluated in a toxicity test or biological field survey that causes no statistically significant difference in effects compared with the controls or a reference site. The LOAEL is the lowest level of a contaminant evaluated in a toxicity test or biological field survey that causes no statistically significant difference in effects compared with the controls or a reference site. Based on EPA ecological risk assessment guidance, the NOAEL HQ and the LOAEL HQ with a value greater than 1.0 indicates that the exposure concentration has the potential to cause adverse effects in receptor species.

Summaries of the ecological risks to aquatic or terrestrial receptors are presented below.

Aquatic Risks – Potential ecological risks to aquatic receptors were evaluated based on analytical data of surface water and sediment samples. Based on the results of the screening level risk assessment, there is "potential ecological risk" at Site 2 from the following metals in surface water: aluminum, cadmium, copper, iron, lead, silver, and zinc. There is "potential ecological risk" at Site 2 from the following metals in sediment: aluminum, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, nickel, selenium, silver, thallium, vanadium, and zinc. Pesticides and PAHs do not pose adverse ecological risk.

Terrestrial Risks – Potential ecological risks to terrestrial receptors were evaluated based on analytical data of soil samples. Based on the results of the screening level risk assessment, there is "potential ecological risk" at Site 2 from the following metals: aluminum, antimony, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, and zinc. Pesticides and PAHs do not pose adverse ecological risk.

Threatened and Endangered Species – There are no Federal or State endangered or threatened species in the NSN Site 2 area.

Wetlands – Some of the sediment samples collected from the mature wooded wetland area (located southwest of the drainageway and north of the slag pile area) contained concentrations of lead that exceed BTAG screening values. However, there is no clear pattern to or "hot spot" related to the exceedances, and significant habitat destruction would be required to gain access to this area and accomplish any type of sediment removal. The Navy, EPA, and Virginia DEQ, including a representative from BTAG, agreed that it would be more ecologically destructive to remove sediment in this area than to leave the area as it is. Based on this agreement, the Navy, EPA, and Virginia DEQ made a risk management decision to leave the wooded wetland area intact.

Subsequently, representatives of the Navy and the U.S. Army Corps of Engineers conducted a site visit on March 25, 1999. The Corps of Engineers determined that the Site 2 drainageway is a man-made, upland stormwater management ditch and is not a jurisdictional wetland. The Corps determined that there is a small area within the mature wooded area southwest of the drainageway that could be considered jurisdictional wetland. Because the sediment removal action is limited to the stormwater management ditch and does not infringe upon the wooded wetland, the jurisdictional wetland area is not impacted.

2.6 Description of Remedial Alternatives

A detailed analysis of the possible remedial alternatives for the soil, groundwater, sediment, and surface water at Site 2 was conducted as part of the FS and PRAP reports. The detailed analysis was conducted in accordance with the EPA document entitled *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA 1989) and the NCP. A summary of the remedial alternatives evaluated for the Site 2 soil, groundwater, sediment, and surface water is presented below.

2.6.1 Subsurface Soil Remedial Alternatives

The primary contaminants of concern in the subsurface soil are various inorganics, with lead as the indicator parameter. Seven remedial alternatives were developed for subsurface soil remediation. The remedial alternatives are summarized as follows:

- Alternative 1 – No action
- Alternative 2 – Institutional controls
- Alternative 3 – Asphalt and soil cover, institutional controls, and long-term monitoring
- Alternative 4 – Excavation and off-site disposal
- Alternative 5 – Partial excavation, asphalt cover, institutional controls, and long-term monitoring

- Alternative 6 — *In situ* stabilization, soil cover, institutional controls, and long-term monitoring
- Alternative 7 — Excavation, on-site soil washing, and on-site disposal
- Alternative 8 — Partial excavation and *in situ* stabilization, institutional controls, and long-term monitoring

Table 2-3 presents brief descriptions of these remedial alternatives.

2.6.2 Groundwater Remedial Alternatives

Three groundwater remedial alternatives were developed and evaluated for Site 2. The three groundwater remedial alternatives include the following:

- Alternative 1 — No action
- Alternative 2 — Installation of an asphalt and soil cover and institutional controls
- Alternative 3 — Asphalt and soil cover, long-term monitoring, and institutional controls

A brief description of each groundwater alternative is provided in Table 2-4.

2.6.3 Sediment and Surface Water Remedial Alternatives

Four sediment and surface water remedial alternatives were developed and evaluated for Site 2. As noted previously, remediation of Site 2 sediment will result in a reduction of contaminant levels in the surface water. The four remedial alternatives include the following:

- Alternative 1 — No action
- Alternative 2 — Institutional controls
- Alternative 3 — Excavation, off-site disposal, and monitoring
- Alternative 4 — Excavation, on-site phytoremediation, and monitoring

A brief description of each remedial alternative is provided in Table 2-5.

TABLE 2-3
Summary of Subsurface Soil Remedial Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Asphalt and Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 4 Excavation and Off-Site Disposal	Alternative 5 Partial Excavation Asphalt Cover, Institutional Controls, and Long-Term Monitoring	Alternative 6 *In Situ* Stabilization, Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 7 Excavation, On-site Soil Washing, and On-Site Disposal	Alternative 8 Partial Excavation, *In Situ* Stabilization, Institutional Controls, and Long-Term Monitoring
Description	No remedial efforts will be conducted to reduce the contamination in the subsurface soil. No actions will be taken to reduce human and environmental contact with the subsurface soil contaminants. This remedial alternative was evaluated to provide a baseline for comparison with other remedial alternatives.	No action except land use controls (to prohibit the use of groundwater underlying the site for drinking water) will be incorporated in the Navy planning documents. Five-year site reviews (consisting of visual inspections and qualitative risk analyses) would be required, since contamination would be left in place.	Includes construction of an asphalt cover (over the existing gravel parking lot) and a soil cover (over the grassy field) over the contaminated soil. Includes incorporation of land use controls in the Navy planning documents to prohibit excavation or other disturbance of the soil and asphalt cover and to prohibit the use of groundwater underlying the site for drinking water. Five-year site reviews (based on long-term ground water monitoring) would be required, since contamination would be left in place.	Includes excavation of the contaminated soil, and off-site disposal in either a RCRA Subtitle C landfill (after off-site stabilization of the contaminated material) or disposal in a RCRA Subtitle D landfill, depending on the results of Toxicity Characteristic Leachate Procedure (TCLP) analyses. Characterization samples (for TCLP analyses) will be collected *in situ*, prior to initiation of excavation activities, preferably 90 days before.	Includes excavation of the contaminated soil near the sanitary force main on-site. Off-site disposal of the excavated soil would occur as described in Alternative 4. An asphalt cover also would be constructed over the original area of contamination. Includes incorporation of land use controls in the Navy planning documents to prohibit excavation or other disturbance of the asphalt cove and to prohibit the use of groundwater underlying the site for drinking water. Five-year site reviews (based on long-term groundwater monitoring) would be required, since part of the subsurface soil contamination would be left in place.	Includes *in situ* stabilization of the contaminated soil and installation of a soil cover over the stabilized media (to provide a buffer zone between potential receptors and the stabilized media). Stabilization uses a mix of inorganic reagents (for example, cement and lime) and the waste to form a chemically and mechanically stable solid. Includes incorporation of land use controls in the Navy planning documents to prohibit disturbance of the stabilized soil and soil cover and to prohibit the use of groundwater underlying the site for drinking water. Five-year site reviews (based on long-term ground-water monitoring), to track future contaminant migration would be required, since contaminated soil would be left in place.	Includes excavation of the contaminated soil, on-site soil washing of the excavated soil, and on-site disposal of the treated soil (after ensuring that the PRGs have been met).	Includes excavation of the contaminated soil down to the groundwater table and *in situ* stabilization of the remaining contaminated soil lying below the groundwater table (eliminates having to de-water the contaminated area). Stabilization uses a mix of inorganic reagents (for example, cement and lime) and the waste to form a chemically and mechanically stable solid. Includes incorporation of land use controls in the Navy planning documents to prohibit disturbance of the stabilized soil and to prohibit the use of groundwater underlying the site for drinking water. Five-year site reviews will be conducted (based on long-term groundwater monitoring) since part of the sub-surface soil contamination would be left in place. Off-site disposal of the excavated soil would occur as described in Alternative 4.
Estimated Time Until Action Is Complete	Immediate	1 month	1 month	3 months	1 month	2 1/2 months	8 1/2 months	3 months
Estimated Capital Cost	$0	$0	$437,000	$2.44 million - $8.19 million	$762,000 - $1.1 million	$2.93 million	$5.24 million	$2.44 million – $6.65 million

TABLE 2-3
Summary of Subsurface Soil Remedial Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Asphalt and Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 4 Excavation and Off-Site Disposal	Alternative 5 Partial Excavation Asphalt Cover, Institutional Controls, and Long-Term Monitoring	Alternative 6 *In Situ* Stabilization, Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 7 Excavation, On-site Soil Washing, and On-Site Disposal	Alternative 8 Partial Excavation, In Situ Stabilization, Institutional Controls, and Long-Term Monitoring
Estimated Annual O&M Cost	$0	$3,400	$14,000	$0	$14,000	$8,000	$0	$8,000
Estimated Net Present-Worth Cost	$0	$9,500	$573,000	$2.44 million - $8.19 million[2,3]	$898,000 ? $1.24 million[2]	$2.93 million	$5.24 million	$2.49 million ? $6.70 million[2]

[1] Assumes a duration of 30 years, for cost estimating purposes.

[2] The magnitude of the estimated net present-worth ranges for Alternative Nos. 4, 5, and 8 is dependent on whether the excavated waste is hazardous. The higher cost for hazardous waste disposal is attributed to the higher transportation and treatment/disposal costs. The cost range assumes that either 100 percent of the waste is hazardous (resulting in the higher estimated net present worth) or 100 percent of the waste is nonhazardous (resulting in the lower estimated net present worth).

[3] For Alternative 4, the estimated net present-worth cost assumes that either 100 percent of the excavated waste is nonhazardous or 100 percent of the excavated waste is hazardous. In fact, the actual conditions are likely to be that some material is hazardous, and some is not. If the assumption is made that 1/4 of the excavated waste is hazardous, 1/4 of the excavated waste is nonhazardous, and $^1/_2$ of the excavated waste can be used as backfill, the estimated net present-worth cost would be $2,509,000. If the assumption is made that 1/3 of the excavated waste is hazardous, 1/3 of the excavated waste is nonhazardous, and 1/3 of the excavated waste can be used as backfill, the estimated net present-worth cost would be $3,166,000. The costs for these last two sub-alternatives incorporate the costs for an extensive *in situ* characterization study (prior to excavation), which would take an additional 1.5 months to complete.

TABLE 2-4
Summary of Groundwater Remedial Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Installation of an Asphalt and Soil Cover and Institutional Controls	Alternative 3 Asphalt and Soil Cover, Long-Term Monitoring, and Institutional Controls
Description	No remedial efforts will be conducted to reduce potential for contamination to the groundwater. No action will be taken to reduce human and environmental contact with the groundwater. This remedial alternative was evaluated to provide a baseline for comparison to other alternatives.	Includes construction of an asphalt and soil cover, to limit downward percolation of precipitation into the groundwater table. Includes incorporation of land use controls in the Navy planning documents to prohibit the use of groundwater underlying the site for drinking water and prohibit excavation or other disturbance of the asphalt and soil cover. Five-year site reviews will be conducted since contamination will be left in place.	Includes construction of a cover, consisting of asphalt and soil, to limit downward percolation of precipitation into the groundwater table. Long-term monitoring would consist of collecting unfiltered and filtered groundwater samples from the six existing monitoring wells on-site annually for the first 5 years, and every 5 years thereafter (composing the five-year site reviews to ensure that further degradation of groundwater quality does not occur). Samples would be analyzed for inorganics. Includes incorporation of land use controls in the Navy planning documents to prohibit the use of groundwater underling the site for drinking water and to prohibit excavation or other disturbance of the asphalt and soil cover.
Estimated Time Until Action Is Complete	Immediate	1 month.	Same as Alternative 2.
Estimated Capital Cost	$0	$437,000	$437,000
Estimated Annual O&M Costs1	$0	$9,400	$14,000
Estimated Net Present-Worth Cost	$0	$523,000	$573,000

[1] Assumes a duration of 30 years, for cost estimating purposes.

TABLE 2-5
Summary of Sediment and Surface Water Remedial Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation, Off-Site Disposal, and Monitoring	Alternative 4 Excavation, On-Site Phytoremediation, and Monitoring
Description	No remedial efforts will be conducted to reduce the contamination in the sediment and surface water. No actions will be taken to reduce human and environmental contact with the sediment and surface water contaminants. This remedial alternative was evaluated to provide a baseline for comparison with other remedial alternatives.	Includes incorporation of land use controls in the Navy planning documents to prohibit the use of groundwater underlying the site for drinking water. Five-year site reviews would be required, since contamination would be left in place. Five-year site reviews would consist of collecting and analyzing surface water and sediment samples.	Includes excavation of the contaminated sediment (to a depth of its interface wth the underlying soil) and off-site disposal in either a RCRA Subtitle C landfill (after off- site stabilization of the contaminated material) or disposal in a RCRA Subtitle D landfill, depending on the results of Toxicity Characteristic Leachate Procedure (TCLP) analyses. Characterization samples (for TCLP analyses) will be collected *in situ*, prior to initiation of excavation activities, preferably 90 days before. If sediment contamination exists deeper than 2 feet below ground surface, the contamination may be excavated further or covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill (decision will be based on the direction of the Navy). Sediment and surface water contamination will be monitored to confirm that the channel has not been re-contaminated. Such monitoring will be conducted every year for the first 5 years after the contaminated sediment is excavated. Also includes stabilization of the west bank of the upstream section of the drainage channel (to prevent further erosion of contaminated sediment). Five-year reviews would be required if sediment contamination exists deeper than 2 feet below ground surface and such contaminated sediment is left in place and covered with an engineered cover layer.	Includes excavation of the contaminated sediment (to a depth of its interface with the underlying soil) and on-site phytoremediation of the excavated sediment. If sediment contamination exists deeper than 2 feet below ground surface, the contamination may be excavated further or covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill (decision will be made at the direction of the Navy). Sediment and surface water contamination will be monitored to confirm that the channel has not been re-contaminated. Also includes stabilization of the west bank of the upstream section of the drainage channel (to prevent further erosion of contaminated sediment). Five-year reviews would be required if sediment contamination exists deeper than 2 feet below ground surface and such contaminated sediment is left in place and covered with an engineered cover layer.
Estimated Time Until Action Is Complete	Immediate	1 month	2 months.	9 months (anticipated total time for on-site treatment of the sediment is one growing season).

TABLE 2-5
Summary of Sediment and Surface Water Remedial Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation, Off-Site Disposal, and Monitoring	Alternative 4 Excavation, On-Site Phytoremediation, and Monitoring
Estimated Capital Cost	$0	$0	$270,000 - $590,000	$300,000
Estimated Annual O&M Costs[1]	$0	$10,400	$10,400	$10,400
Estimated Net Present-Worth Cost	$0	$29,000	$320,000 - $630,000[2].	$340,000[3]

1 Assumes a duration of five years for cost estimating purposes.

2 The magnitude of the estimated net present-worth range for Alternative No. 3 is dependent on whether the excavated waste is hazardous or not. The higher cost for hazardous waste disposal is attributed to the higher transportation and treatment/disposal costs. The cost range assumes that either 100 percent of the waste is hazardous (resulting in the higher estimated net present worth) or 100 percent of the waste is nonhazardous (resulting in the lower estimated net present worth).

3 The cost of Alternative No. 4 assumes that treated sediment can be left in place on-site after lead levels are reduced below 218 mg/kg.

2.7 Summary of the Comparative Analysis of Alternatives

As required by CERCLA, the remedial alternatives for soil, groundwater, sediment, and surface water described in Section 2.6 were evaluated against the nine evaluation criteria identified in the NCP at 40 C.F.R. Section 300.430(e)(9). The nine evaluation criteria fall into three categories: threshold criteria, primary balancing criteria, and modifying criteria.

The threshold criteria must be met for an alternative to be eligible for selection. The primary balancing criteria are used to weigh major trade-offs among alternatives. Generally, the modifying criteria are taken into account after public comment is received on the PRAP. The nine evaluation criteria, which are summarized in Table 2-6, include the following:

Threshold Criteria

- Overall protection of human health and the environment
- Compliance with ARARs

Primary Balancing Criteria

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness
- Implementability
- Cost

Modifying Criteria

- State acceptance
- Community acceptance

2.7.1 Threshold Criteria

Overall Protection of Human Health and the Environment

Evaluation of the overall protectiveness of alternatives focused on whether a specific alternative would achieve adequate protection of human health and the environment and how risks posed by each exposure pathway would be eliminated, reduced, or controlled through treatment, engineering, or institutional controls. The overall assessment of the level of protection includes the evaluations conducted under other criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

Compliance with ARARs

This evaluation involved determining whether each alternative would meet all of the pertinent Federal and State ARARs. Chemical-specific ARARs are identified in Section 2.3 and location-and action-specific ARARs are identified in Appendix A of this ROD.

TABLE 2-6
Glossary of Evaluation Criteria
Site 2, Naval Station Norfolk, Norfolk, Virginia

- **Overall Protection of Human Health and the Environment** – Addresses whether or not an alternative provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering, or institutional controls.
- **Compliance with ARARs/TBCs** – Addresses whether or not an alternative will meet all of the applicable or relevant and appropriate requirements (ARARs), other criteria to be considered (TBCs), or other federal and state environmental statutes and/or provide grounds for invoking a waiver.
- **Long-Term Effectiveness and Permanence** – Refers to the magnitude of residual risk and to the ability of an alternative to maintain reliable protection of human health and the environment over time once cleanup goals have been met.
- **Reduction of Toxicity, Mobility, or Volume Through Treatment** – Refers to the anticipated performance of the treatment options that may be employed in an alternative.
- **Short-Term Effectiveness** – Refers to the speed with which the alternative achieves protection, as well as to the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.
- **Implementability** – Refers to the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement the chosen solution.
- **Cost** – Includes capital and operation and maintenance costs. For comparative purposes, provides present-worth values.
- **State Acceptance** – Indicates whether, based on its review of the RI and FS reports and the PRAP, the State concurs with, opposes, or has no comment on the selected alternative.
- **Community Acceptance** – Will be assessed in the ROD following a review of the public comments received on the RI and FS reports, and the PRAP.

Each alternative was evaluated for compliance with applicable or relevant and appropriate Federal and State requirements. The evaluation summarized which requirements are applicable or relevant and appropriate to each alternative. The following items were considered for each alternative:

- Compliance with chemical-specific ARARs (e.g., ambient water quality criteria); this factor addresses whether the ARARs can be met, and, if not, whether a waiver may be appropriate
- Compliance with location-specific ARARs (e.g., preservation of historic sites, regulations relative to activities near wetlands or floodplain, etc.); as with other ARAR-related factors, these involve consideration of whether the ARARs can be met or whether a waiver is appropriate
- Compliance with action-specific ARARs (e.g., RCRA minimum technology standards); it must be determined whether ARARs can be met or must be waived

2.7.2 Primary Balancing Criteria

Long-Term Effectiveness and Permanence

This criterion evaluated alternatives with respect to their long-term effectiveness and to the degree of permanence. The primary focus of this evaluation was the residual risk that will remain at the site and the effectiveness of the controls that will be applied to manage residual risks. The assessment of long-term effectiveness was made considering the following four factors:

- The magnitude of the residual risk to human and environmental receptors remaining from untreated waste or treatment residues at the completion of remedial activities
- An assessment of the type, degree, and adequacy of long-term management (including engineering controls, institutional controls, monitoring, and operation and maintenance) required for untreated waste or treatment residues remaining at the site
- An assessment of the long-term reliability of engineering and/or institutional controls to provide continued protection from untreated waste or treatment residues
- The potential need for replacement of the remedy and the continuing need for repairs to maintain the performance of the remedy

Reduction of Toxicity, Mobility, or Volume Through Treatment

This evaluation criterion addressed the degree to which the alternatives employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances. Alternatives that do not employ treatment technologies do not reduce toxicity, mobility, or volume of COCs through treatment. The evaluation considered the following specific factors:

- The treatment processes, the remedies that will be employed, and the materials that will be treated
- The amount or volume of hazardous materials that will be destroyed or treated
- The degree of expected reduction in toxicity, mobility, or volume, including how the principal threat is addressed through treatment
- The degree to which the treatment will be irreversible
- The type and quantity of treatment residuals that will remain following treatment

Short-Term Effectiveness

The short-term effectiveness of each alternative was evaluated relative to its effect on human health and the environment during implementation of the response action. Potential threats to human health and the environment associated with handling, treatment, or transportation of

hazardous substances were considered. The short-term effectiveness assessment was based on four key factors:

- Short-term risks that might be posed to the community during implementation of an alternative
- Potential impacts on workers during a response action and the effectiveness and reliability of protective measures
- Potential environmental impacts of the response action and the effectiveness and reliability of mitigating measures during implementation
- Time until remedial response objectives are achieved

Implementability

Implementability considerations included the technical and administrative feasibility of each alternative and the availability of various materials and services required for its implementation.
The following factors were considered during the implementability analysis:

- **Technical Feasibility:** The relative ease of implementing or completing an action based on site-specific constraints, including the use of established technologies, such as the following:
  - Ability to construct the alternative as a whole (constructibility)
  - Operational reliability or the ability of a technology to meet specified process efficiencies or performance goals
  - Ability to undertake future response actions that may be required
  - Ability to monitor the effectiveness of the remedy
- **Administrative Feasibility:** The ability and time required to obtain any necessary approvals and permits from regulatory agencies.
- **Availability of Services and Materials:** The availability of the technologies, materials, or services required to implement an alternative, including the following:
  - Available capacity and location of needed treatment, storage, and disposal services
  - Availability of necessary equipment, specialists, and provisions for necessary additional resources
  - Timing of the availability of prospective technologies under consideration
  - Availability of services and materials, plus the potential for obtaining bids that are competitive (this may be particularly important for innovative technologies)

Cost

For each remedial alternative, a detailed cost analysis was developed based on conceptual engineering and analyses. Unit prices were based on published construction cost data, quotes from vendors and contractors, and/or engineering judgment. Costs are expressed in terms of 1998 dollars. To allow the costs of remedial alternatives to be compared on the basis of a single figure, the estimated net present-worth value of all capital and annual costs was determined for each alternative. The EPA CERCLA RI/FS Guidance Document (EPA, 1988) recommends that a five percent discount rate be used in present-worth analyses.

2.7.3 Modifying Criteria

State Acceptance

State acceptance indicates whether, based on its review of the 1998 RI and FS reports and the PRAP, the State concurs with, opposes, or has no comment on the selected remedy. With respect to State acceptance, the VDEQ concurs with the selected remedy.

Community Acceptance

Community acceptance is assessed based on a review of comments received on the 1998 RI and FS reports and the PRAP. Community relations activities to date for Site 2 include establishment of an administrative record file, briefings to the Restoration Advisory Board regarding findings of the 1998 RI and FS, release of the PRAP for public review and comment on December 28, 1998, and a public meeting conducted on January 21, 1999. No written comments were received during the comment period. The public meeting was conducted on Thursday, January 21, 1999, at the Navy Lodge in Norfolk, Virginia. No one from the local community attended the meeting and no comments or questions were raised.

2.7.4 Comparative Analysis of Subsurface Soil Alternatives

Following is a comparative analysis of the remedial alternatives developed for subsurface soil using the first seven evaluation criteria. State acceptance and community acceptance are discussed in Section 2.7.3 above. Table 2-7 summarizes the comparative analysis for subsurface soil alternatives.

Overall Protection of Human Health and the Environment

The site-specific remedial action objective (RAO) for Site 2 subsurface soil is to prevent or minimize human health exposure to inorganic contaminants in the subsurface soil above health-based criteria.

TABLE 2-7
Summary of Comparative Analysis of Subsurface Soil Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Asphalt and Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 4 Excavation and Off-Site Disposal[1]	Alternative 5 Partial Excavation, Asphalt Cover, Institutional Controls, and Long-Term Monitoring[1]	Alternative 6 *In situ* Stabilization, Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 7 Excavation, On-Site Soil Washing, and On-site Disposal[1]	Alternative 8 Partial Excavation, *In situ* Stabilization, Institutional Controls, and Long-Term Monitoring
Overall Protection of Human Health and the Environment								
Exposure to Contaminated Subsurface Soil	Does not reduce exposure to contaminated subsurface soil and thus does not reduce risk to human health and the environment. Least protective of all the alternatives.	Would limit access and minimize chance of direct exposure but would not provide added protection of treatment or containment of Alternatives 3 through 8.	The asphalt and soil cover and land use controls will prevent exposure to contaminated subsurface soil. If excavation is required (e.g., during maintenance of the sanitary force main on site), necessary precautions would have to be taken to ensure that workers are protected.	Exposure to contaminated subsurface soil will be prevented because all contamination above the PRGs will be excavated and disposed of in an off-site landfill. Alternative 4 would provide the best level of protection.	The asphalt cover and land use controls will prevent exposure to contaminated subsurface soil. Construction workers would be protected (during future maintenance of the sanitary force main on-site), because the contaminated soil around the main will be excavated and disposed of in an off-site landfill.	Stabilization, accompanied by the soil cover and land use controls will prevent exposure to contaminated subsurface soil. If excavation is required (e.g., during maintenance of the sanitary force main on-site), necessary precautions would have to be taken to ensure that workers are protected.	Exposure to contaminated subsurface soil will be prevented because soil contaminants will be treated to at least meet the PRGs.	Exposure to contaminated subsurface soil will be prevented because the contaminated soil above the groundwater table will be excavated and disposed of in an off-site landfill, and the contaminated soil below the groundwater table will be stabilized (accompanied by land use controls). If excavation is required (e.g., during the maintenance of the sanitary force main on-site), necessary precautions would have to be taken to ensure that workers are protected.
Compliance with ARARs								
Chemical-Specific ARARs	Does not meet chemical-specific ARARs	Same as Alternative 1	Chemical-specific ARARs would be met by covering and land use controls, which would prevent future exposures to subsurface soil contamination.	Chemical-specific ARARs would be met because contaminant concentration above PRGs would be excavated and disposed of off-site.	Chemical-specific ARARs would be met by excavation, covering, and land use controls because exposures would be prevented.	Chemical-specific ARARs likely would be met by stabilization and land use controls because exposures would be prevented. Treatability studies would be required to ensure the treatment technology can cost-effectively meet the PRGs.	Chemical-specific ARARs likely would be met because soil washing will reduce contaminants to below PRGs. Treatability studies would be required to ensure the treatment technology can cost-effectively meet the PRGs.	Chemical-specific ARARs likely would be met because contaminant concentrations above PRGs above the groundwater table would be excavated and disposed of in an off-site landfill, and contaminated soil below the groundwater table would be stabilized. Treatability studies would be required to ensure the treatment technology can cost-effectively meet the PRGs.
Location-Specific ARARs	Not applicable, no action undertaken	Does not meet location-specific ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs
Action Specific ARARs	Not applicable, no action undertaken	Not applicable	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs
Long-Term Effectiveness and Permanence								
Residual Risk Remaining from Any untreated Waste or Treatment Residues at Completion of Remedial Activities	Source not remediated, risk remains	Remaining residual risk is reduced if institutional controls are enforced consistently by NSN.	Risk associated with contact would be reduced because the asphalt and soil cover will serve as a barrier between the subsurface soil contamination and potential receptors.	There will be no residual risk associated with subsurface soil contamination because it will be excavated and disposed of off-site.	Risk associated with contact would be reduced. Risk associated specifically with a construction worker maintaining the sanitary force main on-site would be eliminated.	Residual risk would be minimal because soil would be stabilized and covered, preventing exposure.	Residual risk would be eliminated because the soil would be treated, and residual contaminant concentrations will at least meet the PRGs.	There will be no residual risk associated with subsurface soil contamination above the groundwater table because it will be excavated and disposed of in an off-site landfill. Residual risk associated with stabilized soil below the groundwater table should be minimal.
Long-Term Reliability of Remedial Action to Provide Continued Protection from Any Untreated Waste or Treatment Residues	Source not remediated, risk remains	Reliability of institutional controls depends on how well they are enforced by NSN	Reliability of cover can be high if it is maintained. Failure to maintain cover can increase potential for direct contact with contaminants remaining on-site. Risk associated with contact would be reduced long-term, because land use controls will be	There will be no residual risk associated with subsurface soil contamination because it will be excavated and disposed of off-site.	Reliability of cover can be high if it is maintained. Failure to maintain cover can increase potential for direct contact with contaminants remaining on-site. Risk associated with contact would be	Reliability of stabilization can be high (will depend on treatability studies). Reliability of cover can be high if it is maintained. Failure to maintain cover can increase potential for	Reliability of on-site soil washing can be high (will depend on treatability studies)	Reliability of stabilization can be high (will depend on treatability studies). Reliability of institutional controls depends on how well they are enforced by NSN.

TABLE 2-7
Summary of Comparative Analysis of Subsurface Soil Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Asphalt and Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 4 Excavation and Off-Site Disposal[1]	Alternative 5 Partial Excavation, Asphalt Cover, Institutional Controls, and Long-Term Monitoring[1]	Alternative 6 *In situ* Stabilization, Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 7 Excavation, On-Site Soil Washing, and On-site Disposal[1]	Alternative 8 Partial Excavation, *In situ* Stabilization, Institutional Controls, and Long-Term Monitoring
			incorporated into the Navy planning documents to maintain the integrity of the asphalt and soil cover. Reliability of institutional controls depends on how well they are enforced by NSN.		reduced long-term, because land use controls will be incorporated into the Navy planning documents to maintain the integrity of the asphalt cover. Reliability of institutional controls depends on how well they are enforced by NSN.	direct contact with contaminants remaining on-site. Risk associated with contact would be reduced long-term, because land use controls will be incorporated into the Navy planning documents to maintain the integrity of the stabilized soil and soil cover. Reliability of institutional controls depends on how well they are enforced by NSN.		
Need for 5-Year Review	Not Applicable	Review would be required to ensure that adequate protection of human health and the environment is maintained (consisting of visual inspections and qualitative risk analysis) because contaminated material remains on site.	Same as Alternative 2	No review will be required because soil will be excavated and disposed of off-site.	Same as Alternative 2	Same as Alternative 2	No review will be required because soil will be treated, and contaminant concentrations will at least meet the PRGs.	Same as Alternative 2
Reduction of Toxicity, Mobility, or Volume Through Treatment								
Degree to Which the Toxicity, Mobility, or Volume of Hazardous Substances Are Reduced Through Treatment	None	None	None	None	None	For stabilized soil, mobility and exposure (toxic contaminants still will remain on-site, but will be stabilized and will not be available for exposure) will be significantly reduced, and volume will increase.	Toxicity, mobility, and volume will be reduced by the soil washing process	For stabilized soil, mobility and exposure (toxic contaminants still will remain on-site, but will be stabilized and will not be available for exposure) will be reduced significantly, and volume will increase.
Irreversible Treatment	No treatment performed	No treatment performed	No treatment performed	No treatment performed	No treatment performed	Stabilization is not easily reversed.	Soil washing is irreversible	Stabilization is not easily reversed.
Type and Quantity of Residuals Remaining After Remediation	No treatment undertaken, therefore, all contaminants remain on-site.	No treatment undertaken, therefore, all contaminants remain on-site.	All contaminated soil would remain on-site beneath the asphalt and soil cover.	No soil contamination above the PRGs would remain at Site 2.	No soil contamination above the PRGS would remain surrounding the sanitary force main on-site. Some contaminated soil would remain on-site beneath the asphalt cover.	Stabilized soil would remain on-site beneath the soil cover.	No soil contamination above the PRGS would remain at Site 2 (the soil washing solution would undergo on-site treatment and would be reused or disposed of at a local POTW).	Stabilized soil would remain on-site above the water table.
Statutory Preference for Treatment	Does not satisfy preference	Does not satisfy preference	Does not satisfy preference	Does not satisfy preference	Does not satisfy preference	Partially satisfies treatment preference	Satisfies treatment preference.	Partially satisfies treatment preference
Short-Term Effectiveness								
Short-Term Risks to the Community and Impacts on Workers and the Environment During Implementation of Remedial Action	No remedial action implemented.	Remedy implementation does not add to risk.	Increased risk to workers during installation of asphalt and soil cover. Temporary increase in fugitive dust emissions during installation of asphalt and soil cover.	Temporary increase in fugitive dust emissions during excavation and transport of contaminated soil.	Risk to community and workers because of temporary increase in fugitive dust emissions during excavation and transport of contaminated soil, and during installation of asphalt cover. Increased risk to workers during installation of asphalt cover.	Temporary increase in fugitive dust emissions during stabilization and installation of soil cover. Increased risk to workers during installation of soil cover.	Temporary increase in fugitive dust emissions during excavation and soil washing.	Temporary increase in fugitive dust emissions during excavation, transport, and stabilization.

TABLE 2-7
Summary of Comparative Analysis of Subsurface Soil Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Asphalt and Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 4 Excavation and Off-Site Disposal[1]	Alternative 5 Partial Excavation, Asphalt Cover, Institutional Controls, and Long-Term Monitoring[1]	Alternative 6 *In situ* Stabilization, Soil Cover, Institutional Controls, and Long-Term Monitoring	Alternative 7 Excavation, On-Site Soil Washing, and On-site Disposal[1]	Alternative 8 Partial Excavation, *In situ* Stabilization, Institutional Controls, and Long-Term Monitoring
Expected Time Until Action Is Complete	No time required.	1 month	1 month	3 months	1 month	2 ½ months	8 ½ months	3 months
Implementability								
Technical Feasibility – The Ability to Construct and Operate the Remedial Action	No construction or operation required.	No construction or operation required.	No difficulties in construction of the asphalt and soil cover, which requires conventional construction techniques.	Excavation and off-site disposal are implemented easily. Care would have to be exercised to avoid damaging the sanitary force main on-site.	Excavation and off-site disposal are implemented easily. Care would have to be exercised to avoid damaging the sanitary force main on-site. No difficulties in constructing the asphalt cover, which requires conventional construction techniques.	A treatability study is required for the stabilization process. Care would have to be exercised to avoid damaging the sanitary force main on-site. No difficulties in constructing the soil cover, which requires conventional construction techniques.	A treatability study is required for the soil washing process. Care would have to be exercised to avoid damaging the sanitary force main on-site.	Excavation and off-site disposal are implemented easily. A treatability study is required for the stabilization process. Care would have to be exercised to avoid damaging the sanitary force main on-site.
Ease of Doing More Action if Needed	Very easy to implement additional action.	Very easy to implement additional action.	Easy to implement additional action.	Difficult to implement additional action for the soil that will be disposed of in an off-site landfill. Easy to implement additional action at the site.	Difficult to implement additional action for the soil that will be disposed of in an off-site landfill. Relatively easy to implement additional action for the contaminated soil remaining on-site.	Difficult to implement additional action because of the nature of the stabilized material (forms a solidified matrix)	Easy to implement additional action for soil-washed material.	Difficult to implement additional action because soil above the groundwater table will be disposed of in an off-site landfill, and soil below the groundwater table will be stabilized, forming a solidified matrix.
Ability to Monitor Effectiveness	Easily monitored	Easily monitored. Evaluated during the five-year site reviews.	Easily monitored. Evaluated during the five-year site reviews.	No need for monitoring because no contamination above PRGs will remain.	Easily monitored. Evaluated during the five-year site reviews.	Easily monitored. Evaluated during the five-year site reviews.	No need for monitoring because no contamination above PRGs will remain.	Easily monitored. Evaluated during the five-year site reviews.
Administrative Feasibility – The Ability To Obtain Any Approvals and Permits from, and to Coordinate with, Other Agencies	Not applicable	Not applicable	Not applicable	Requires coordination with off-site disposal facility.	Requires coordination with off-site disposal facility.	Not applicable	Not applicable	Requires coordination with off-site disposal facility.
Availability of Services, Equipment, and Materials	Not applicable	Not applicable	Services, equipment, and materials are readily available for all aspects of remediation.	Services, equipment, and materials are readily available for all aspects of remediation.	Services, equipment, and materials are readily available for all aspects of remediation.	Specialty contractor required for stabilization. Many contractors are available.	Specialty contractor required for soil washing. Many contractors are available.	A variety of capable contractors are available for the excavation. Specialty contractor required for the stabilization process. Many contractors are available.
Cost								
Estimated Capital Cost	$0	$0	$437,000	$2.44 million – $8.19 million	$762,000 - $1.1 million	$2.93 million	$5.24 million	$2.44 million – $6.65 million
Estimated Annual O&M Cost[3]	$0	$3,400	$14,000	$0	$14,000	$8,000	$0	$8,000
Estimated Net Present Worth Cost	$0	$9,500	$573,000	$2.44 million – $8.19 million[2 4]	$898,000 - $1.24 million[2]	$2.98 million	$5.24 million	$2.49 million – $6.70 million[2]

[1] Alternative Nos 4, 5, and 7 – Since part (1.5 to 2 feet) of contaminated soil lies beneath the groundwater table, a component of these alternatives would include a form of dewatering. Either an absorbent material can be used to absorb the excess water (e.g., lime or Liquisorb®; the area can be dewatered using wellpoints (including filtration and discharge of the extracted water to the Site 2 drainageway); or the soil can be excavated in the July-through-November period when the groundwater table is lowest, depending on site conditions at the time of remediation. The cost estimate incorporates the cost for wellpoint installation and filtration of the extracted groundwater (conservative approach).

[2] The magnitude of the estimated net present-worth ranges for Alternative Nos 4, 5, and 8 depends on whether the excavated waste is hazardous. The higher cost for hazardous waste disposal is attributed to both the higher transportation and treatment/disposal costs. The cost range assumes that either 100 percent of the waste is hazardous (resulting in the higher estimated net present worth) or 100 percent of the waste is nonhazardous (resulting in the lower estimated net present worth).

[3] Assumes duration of 30 years, for cost-estimating purposes.

[4] For Alternative 4, the estimated net present-worth cost assumes that either 100 percent of the excavated waste is nonhazardous or 100 percent of the excavated waste is hazardous. In fact, the actual conditions likely are to be that some material is hazardous, and some is not. If the assumption is made that ¼ of the excavated waste is hazardous, ¼ of the excavated waste is nonhazardous, and ½ of the excavated waste can be used as backfill, the estimated net present-worth cost would be $2,509,000. If the assumption is made that 1/3 of the excavated waste is hazardous, 1/3 of the excavated waste is nonhazardousk and 1/3 of the excavated waste can be used as backfill, the estimated present worth cost would be $3,166,000. The costs for these last two sub-alternatives incorporate the costs for an extensive *in situ* (prior to excavation) characterization study, which would take an additional 1.5 months to complete.

Alternative 1 will not meet the RAO, since no action will be implemented to prevent exposure to the contaminated subsurface soil. Alternative 2 also will not meet the RAO for subsurface soil, since no action except groundwater use restrictions will be implemented. Alternative 3 will meet the RAO for subsurface soil because future exposures to contaminated soil will be prevented by the asphalt and soil cover. In addition, land use controls will be incorporated into the Navy planning documents to prevent future excavation or other disturbance of the asphalt and soil cover. In the event excavation is required in the contaminated area (e.g., for maintenance of the sanitary force main on-site), necessary precautions would need to be taken to ensure that the construction workers are protected adequately.

The remaining alternatives will meet or are expected to meet (in the case of the treatment alternatives that require treatability studies) the RAO for subsurface soil. Alternative 4 will be the most protective of human health and the environment. Alternative 4 will prevent exposure to contaminated subsurface soil because the contaminated soil will be excavated and disposed of appropriately off-site according to the characterization sample analyses. The characterization samples would be analyzed at an off-site laboratory for TCLP metals, ignitability, reactivity, corrosiveness, and total petroleum hydrocarbons (TPH), plus any other analyses required by the disposal facility.

In Alternative 5, part of the contaminated soil (surrounding the sanitary force main) will be excavated and disposed of appropriately off-site according to the characterization sample analyses, and an asphalt cover will be constructed over the area. In addition, Alternative 5 includes implementation of land use controls that will minimize exposure to contaminants in the subsurface soil by prohibiting excavation or other disturbance of the asphalt cover.

In Alternative 6, soil contamination above and below the groundwater table will be stabilized *in situ* by using a mix of inorganic reagents (for example, cement and lime) and the waste to form a chemically and mechanically stable solid. In addition, Alternative 6 includes implementation of land use controls that will minimize exposure to contaminants in the subsurface soil by prohibiting disturbance of the stabilized soil and soil cover.

In Alternative 7, contaminated soil will be soil washed and used as backfill on-site.

In Alternative 8, contaminated soil will be excavated down to the groundwater table and disposed of appropriately according to the characterization sample analyses. The characterization samples would be analyzed at an off-site laboratory for TCLP metals, ignitability, reactivity, corrosiveness, and total petroleum hydrocarbons, plus any other analyses required by the disposal facility. The soil contamination below the groundwater table will be stabilized *in situ* by using a mix of inorganic reagents (for example, cement and lime) and the waste to form a chemically and mechanically stable solid. In addition, Alternative 8 includes implementation of land use controls, which will minimize exposure to contaminants in the subsurface soil by prohibiting disturbance of the stabilized soil.

Compliance with ARARs

All alternatives, except Alternatives 1 and 2, would comply with chemical-, location-, and action specific ARARs. Chemical-specific ARARs are set forth in Section 2.3 and location- and action-

specific ARARs are set forth in Appendix A. Treatability studies would be required for Alternatives 6, 7, and 8 to ensure that the soil washing or in situ stabilization treatment technologies can cost-effectively meet the preliminary remediation goals (PRGs).

Long-Term Effectiveness and Permanence

Alternatives 4 and 7 provide the greatest level and similar degrees of long-term effectiveness and permanence because, under these alternatives, the site could be returned to normal use with few restrictions. These alternatives rely on disposal or treatment. Therefore, part of the overall evaluation of long-term effectiveness must consider the adequacy of the landfill that accepts the material for disposal.

Alternatives 6 and 8 provide a significant measure of permanence and long-term effectiveness. Subsurface soil will be stabilized and remain on-site following remedial action. It is expected that stabilized media will remain effective at immobilizing soil contaminants; however, land use controls and long-term monitoring would be required since the contamination would remain on-site.

Alternatives 3 and 5 provide a lesser degree of permanence than the other alternatives because contaminated soil will not be treated but will be covered. However, the cover will be coupled with land use controls, and a monitoring program will be implemented to assist in tracking contaminant migration. Land use controls under Alternative 3 prohibit excavation or other disturbance of the soil and asphalt cover and prohibit the use of groundwater underlying the site for drinking water. Land use controls under Alternative 5 prohibit excavation or other disturbance of the asphalt cover and prohibit the use of groundwater underlying the site for drinking water. In the event that an excavation is required in the contaminated area (e.g., for maintenance of the sanitary force main on-site), necessary precautions would need to be taken under Alternative 3 to ensure that the construction workers are adequately protected.

Reduction of Toxicity, Mobility, or Volume Through Treatment

At Site 2, transport of subsurface soil contaminants to surface water and sediment of the Site 2 drainage channel (the primary concerns for contaminant transport from Site 2 subsurface soil) will be reduced by stabilizing the west bank of the upstream section of the drainage channel, which is an element of the remedial action selected to address the sediment and surface water. The remainder of this section presents a discussion of the subsurface soil remedial alternatives' effectiveness in reducing contaminant toxicity and volume.

Alternative 7 provides the most significant decrease in contaminant toxicity and volume. In this alternative, soil washing will be used to remediate the soil to the PRGs, reducing toxicity and volume.

In Alternatives 6 and 8, the potential for receptors to be exposed to soil contamination will be reduced significantly because the contaminated soil remaining on-site would be stabilized. Stabilization is designed to limit the mobility of hazardous constituents in the waste and to improve the handling and physical characteristics of the waste. Stabilization uses a mix of inorganic reagents (for example, cement and lime) and the waste to form a chemically and

mechanically stable solid. Exposure to contaminant toxicity would be lower than if no action were to take place. Contaminant volume will increase because of the need to add stabilization agents.

In Alternatives 3 and 5, the cover will act as a physical barrier, preventing future exposures. Contaminant volume on-site will remain unchanged. In Alternative 4, the toxicity and volume of soil contamination will remain the same; however, the soil contamination will be removed from the site and disposed of, eliminating concerns over toxicity and volume at the site.

Short-Term Effectiveness

Alternatives 4 through 8 likely will cause a similar amount of disturbance to the surrounding community during implementation. In all of these alternatives, a significant amount of soil handling will be required, so the potential for fugitive dust and air emissions impacts exists.

Alternative 3 will cause less disturbance than the other alternatives because the remedial action consists primarily of asphalt and soil cover installation.

Implementability

Alternatives 6, 7, and 8 likely are the most technically challenging to implement. Treatability testing is required to validate the use of soil washing and stabilization technologies on NSN soil and to confirm that the technologies can meet the PRGs.

The remaining technologies (Alternatives 3 through 5) rely primarily on excavation and disposal, or installation of an asphalt and soil cover. These are typical construction activities and offer no significant technical challenge.

In addition, extreme care would have to be exercised during implementation of Alternatives 4 through 8 to avoid damaging the sanitary force main running through Site 2. Land use controls and five-year site reviews will be required in Alternatives 3, 5, 6, and 8 because stabilized or contaminated media will remain on-site following remedial action.

Cost

Table 2-7 presents a comparative cost summary of all eight subsurface soil remedial alternatives.

2.7.5 Comparative Analysis of Groundwater Alternatives

Following is a comparative analysis of the remedial alternatives developed for groundwater using the first seven evaluation criteria. State acceptance and community acceptance are discussed in Section 2.7.3 above. Table 2-8 summarizes the comparative analysis for the groundwater alternatives.

TABLE 2-8
Summary of Comparative Analysis of Groundwater Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Installation of an Asphalt and Soil Cover and Institutional Controls	Alternative 3 Asphalt and Soil Cover, Long-Term Monitoring, and Institutional Controls
Overall Protection of Human Health and the Environment			
Preventing Degradation of Groundwater by Reducing the Potential for Dissolved Lead to Leach into the Water table Aquifer at Site 2	No reduction in downward percolation of precipitation (and thereby no reduction of the potential for the leaching of dissolved lead) into the water table aquifer at Site 2.	Installing an asphalt and soil cover over the subsurface soil contamination will limit downward percolation of precipitation (thereby reducing the potential for leaching of dissolved lead) into the water table aquifer at Site 2. If construction activities were to occur where exposure to lead in groundwater were possible, necessary precautions would have to be taken to prevent risk to construction workers. Institutional controls will prohibit the use of groundwater underlying Site 2 for drinking water.	Same as Alternative 2, but includes long-term monitoring of groundwater to ensure that further degradation of groundwater quality does not occur.
Compliance with ARARs			
Chemical-Specific ARARs	Does not meet chemical-specific ARARs.	The chemical-specific ARAR (drinking water action level for lead) will be met in filtered groundwater. Institutional controls will prohibit the use of groundwater underlying Site 2 for drinking water. The chemical-specific ARAR for lead will not be met in unfiltered groundwater, since the lead levels in unfiltered groundwater at Site 2 are comparable to levels in unfiltered groundwater from background upgradient wells. In addition, lead levels in unfiltered groundwater are used in determining risks from accidental exposures to shallow groundwater during excavation/construction activities, and not for evaluating risks from potable use of groundwater. If construction activities were to occur where exposure to lead in groundwater were possible, necessary precautions would have to be taken to prevent risk to construction workers.	Same as Alternative 2.
Location-Specific ARARs	Not applicable; no action undertaken.	Complies with ARARs.	Same as Alternative 2.
Action-Specific ARARs	Not applicable; no action undertaken.	Complies with ARARs.	Same as Alternative 2.

TABLE 2-8
Summary of Comparative Analysis of Groundwater Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Installation of an Asphalt and Soil Cover and Institutional Controls	Alternative 3 Asphalt and Soil Cover, Long-Term Monitoring, and Institutional Controls
Long-Term Effectiveness and Permanence			
Residual Risk Remaining from Any Untreated Waste or Treatment Residues at Completion of Remedial Activities	No controls are in place to prevent the potential for dissolved lead to leach into the water table aquifer at Site 2.	There is no human health risk associated with filtered groundwater at the site; therefore, no residual risk from filtered groundwater will remain by implementing this alternative. Covering the land surface will reduce the potential for dissolved lead to leach into the water table aquifer at Site 2. No procedure will be implemented under this alternative to confirm whether contaminant levels are within protective levels.	There is no human health risk associated with filtered groundwater at the site; therefore, no residual risk from filtered groundwater will remain by implementing this alternative. Covering the land surface will reduce the potential for dissolved lead to leach into the water table aquifer at Site 2. Long-term monitoring will be implemented under this alternative to confirm whether contaminant levels are within protective levels.
Long-Term Reliability of Response Action To Provide Continued Protection from Any Untreated Waste or Treatment Residues	No controls are in place to prevent the potential for dissolved lead to leach into the water table aquifer at Site 2, therefore this is not reliable in the long-term.	No residual risk from filtered groundwater will remain by implementing this alternative. Covering the land surface will reduce the long-term potential for dissolved lead to leach into the water table aquifer at Site 2.	No residual risk from filtered groundwater will remain by implementing this alternative. Covering the land surface will reduce the long-term potential for dissolved lead to leach into the water table aquifer at Site 2. Long-term monitoring also will be implemented under this alternative to confirm whether contaminant levels are within protective levels.
Need for Five-Year Review	Not applicable.	Five-year reviews would be conducted to ensure that adequate protection of human health and the environment is maintained, and that degradation of groundwater does not occur.	Five-year site reviews would be conducted to ensure that adequate protection of human health and the environment is maintained, and that degradation of groundwater does not occur.
Reduction of Toxicity, Mobility, or Volume Through Treatment			
Degree To Which the Toxicity, Mobility, or Volume of Hazardous Substances Are Reduced Through Treatment	None.	No treatment performed.	Same as Alternative 2.
Irreversible Treatment	Not applicable.	No treatment performed.	Same as Alternative 2.

TABLE 2-8
Summary of Comparative Analysis of Groundwater Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Installation of an Asphalt and Soil Cover and Institutional Controls	Alternative 3 Asphalt and Soil Cover, Long-Term Monitoring, and Institutional Controls
Type and Quantity of Residuals Remaining After Remediation	Lead in unfiltered groundwater may pose a risk to construction workers; however, the lead levels at Site 2 are comparable to levels in upgradient wells (therefore, treatment of Site 2 groundwater will not reduce the potential risk). If construction activities were to occur where exposure to lead in groundwater were possible, necessary precautions would have to be taken to prevent risk to construction workers.	Same as Alternative 1.	Same as Alternative 1.
Statutory Preference for Treatment	There is no human health risk in filtered groundwater, and lead levels in unfiltered groundwater are comparable to levels in upgradient wells; therefore, treatment alternatives were not evaluated.	Same as Alternative 1.	Same as Alternative 1.
Short-Term Effectiveness			
Short-Term Risks To the Community and Impacts on Workers and the Environment During Implementation of Remedial Action	No remedial action implemented.	Adds minimal risk because response action primarily consists of installing asphalt and soil cover.	Same as Alternative 2.
Time Until Action Is Complete	No time required.	Expected to take 1 month.	Same as Alternative 2.

TABLE 2-8
Summary of Comparative Analysis of Groundwater Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Installation of an Asphalt and Soil Cover and Institutional Controls	Alternative 3 Asphalt and Soil Cover, Long-Term Monitoring, and Institutional Controls
Implementability			
Technical Feasibility — The Ability to Construct and Operate the Remedial Action	No construction or operation required.	No difficulties in constructing the asphalt and soil cover.	Same as Alternative 2.
Ease of Doing More Action if Needed	Very easy to implement additional action.	Additional action can be implemented, easily if required.	Same as Alternative 2.
Ability to Monitor Effectiveness	Easily monitored.	Easily monitored. Evaluated during the five-year site reviews.	Easily monitored. Long-term monitoring would consist of collecting unfiltered and filtered groundwater samples from the six existing monitoring wells on-site annually for the first five years, and every five years thereafter. Samples would be analyzed for inorganics. Evaluated during the five- year site reviews.
Availability of Services, Equipment, and Materials	Not applicable.	Services, equipment, and materials are readily available for all aspects of remediation.	Same as Alternative 2.
Administrative Feasibility —The Ability and Time Required To Obtain Any Approvals and Permits from Regulatory Agencies	Not applicable.	Not applicable.	Not applicable.
Cost			
Estimated Capital Cost	$0	$437,000	$437,000
Estimated Annual O&M Costs[1]	$0	$9,400	$14,000
Estimated Net Present-Worth Cost	$0	$523,000	$573,000

[1] Assumes a duration of 30 years, for cost estimating purposes.

This Page Intentionally Left Blank

Protection of Human Health and the Environment

The site-specific RAO for groundwater is to prevent degradation of groundwater quality by limiting downward percolation of precipitation (and thereby reducing the potential for the leaching of dissolved lead) into the water table aquifer at Site 2.

Alternative 1 will not meet the RAO, since no action will be implemented to limit downward percolation of precipitation into the water table aquifer. Alternatives 2 and 3 will meet the RAO. The RAO will be met because installing an asphalt and soil cover over the contaminated subsurface soil would limit downward percolation of precipitation into the water table aquifer at Site 2.

Compliance with ARARs

The chemical-specific ARAR (drinking water action level for lead) is being met for lead in filtered groundwater; however, no controls would be implemented to prevent degradation of groundwater quality under Alternative 1.

Under both Alternatives 2 and 3, the chemical-specific ARAR (drinking water action level for lead) will be met in filtered groundwater. Alternatives 2 and 3 include institutional controls which prohibit the use of groundwater underlying Site 2 for drinking water. The chemical-specific ARAR will not be met for lead in unfiltered groundwater, since the lead levels in unfiltered groundwater at Site 2 are comparable to levels in unfiltered groundwater from background upgradient wells. In addition, lead levels in unfiltered groundwater are used in determining risks from accidental exposures to shallow groundwater during excavation/construction activities, and not for evaluating risks from potable use of groundwater. If construction activities were to occur where exposure to lead in groundwater were possible, necessary precautions would have to be taken to prevent risk to a construction worker.

Long-Term Effectiveness and Permanence

There are no human health risks associated with filtered groundwater at the site; therefore, no residual risk from filtered groundwater will remain by implementing any of the developed alternatives. Under Alternatives 2 and 3, the soil and asphalt cover will reduce the potential for dissolved lead to leach into the water table aquifer at Site 2. No procedure would be in place under Alternative 2 to monitor contamination levels in the groundwater over time. Alternative 3 includes incorporation of a long-term monitoring program; therefore, it is more reliable than the other alternatives in providing continued protection from site contaminants.

Reduction of Toxicity, Mobility, or Volume through Treatment

None of the alternatives reduces the toxicity, mobility, or volume of hazardous substances in the groundwater through treatment. Reduction in toxicity and volume of lead is not an issue for filtered groundwater, since there is no risk to human health from filtered groundwater. Lead in unfiltered groundwater may pose a risk to a construction worker; however, the lead levels at Site 2 are comparable to levels in upgradient wells (therefore treatment of Site 2 groundwater will not reduce the potential risk). If construction activities were to occur where exposure to lead

in groundwater were possible, necessary precautions would have to be taken to prevent risk to a construction worker.

Short-Term Effectiveness

Alternatives 2 and 3 will cause a minimal amount of disturbance to the surrounding community during implementation since the remedial action consists primarily of installing a soil and asphalt cover.

Implementability

Alternatives 2 and 3 rely primarily on installing a soil and asphalt cover. This involves typical construction activities and presents no significant technical challenge.

Cost

Table 2-8 presents a comparative cost summary of all three groundwater alternatives.

2.7.6 Comparative Analysis of Sediment and Surface Water Alternatives

Following is a comparative analysis of the remedial alternatives developed for sediment and surface water using the first seven evaluation criteria. State acceptance and community acceptance are discussed in Section 2.7.3 above. Table 2-9 summarizes the comparative analysis of the sediment and surface water alternatives.

Overall Protection of Human Health and the Environment

The site-specific RAO for Site 2 sediment and surface water is to minimize, to the extent practical, the current risk to ecological receptors posed by lead-contaminated sediment and surface water, and to prevent further migration of contaminated sediment from the site.

Alternative 1 will not meet the RAO, since no action will be implemented to prevent exposure to the contaminated sediment and surface water. Alternative 2 also will not meet the RAO, since it only includes implementing institutional controls to prohibit the use of groundwater underlying the site for drinking water.

The remaining alternatives will meet the RAOs. In Alternative 3, contaminated sediment will be excavated and disposed of appropriately off-site according to the characterization sample (TCLP) analyses. In Alternative 4, contaminated sediment will undergo phytoremediation until the lead cleanup level is met (assume one growing season). Residual contamination that may be left in place under both alternatives will be covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill. Remediation of Site 2 sediment under both Alternatives 3 and 4 will result in a reduction of contaminant levels in the surface water.

Compliance with ARARs

Alternatives 3 and 4, but not Alternatives 1 and 2, would comply with location-, action-, and chemical-specific ARARs. Treatability studies would be required for Alternative 4 to ensure the phytoremediation treatment technologies can meet the lead cleanup level (TBC criteria) for the sediment cost-effectively. Remediation of Site 2 sediment under both Alternatives 3 and 4 will result in a reduction of contaminant levels in the surface water because surface water in the

drainage channel no longer will come into contact with contaminated sediments. Surface water and sediment will be sampled under Alternatives 3 and 4, and surface water sampling results will be compared with ambient water quality criteria for lead.

Long-Term Effectiveness and Permanence

Alternatives 3 and 4 provide similar degrees of long-term effectiveness and permanence because, in these alternatives, the contaminated sediment would be removed, treated, or covered, and the site could be returned to normal use with certain restrictions. These alternatives rely on disposal or treatment. Part of the overall evaluation of long-term effectiveness must consider the adequacy of the landfill that accepts the excavated material under Alternative 3. It is expected there will be no residual risk remaining in the surface water under both alternatives, since surface water in the drainage channel no longer will come into contact with contaminated sediment.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 4 is the only alternative that involves treatment. Alternative 4 has the potential to provide a significant decrease in contaminant toxicity and volume in sediment through treatment. In this alternative, phytoremediation will be used to remediate the sediment to the lead clean-up level, reducing toxicity and volume. Arsenic, 4,4'-DDD, and 4,4'-DDE cannot be treated through phytoremediation; therefore, the toxicity and volume of those contaminants will not be reduced.

Residual contamination that may be left in place under this alternative will be covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill.

Short-Term Effectiveness

Alternatives 3 and 4 will cause a similar amount of disturbance to the surrounding community during implementation. In both of these alternatives, a significant amount of sediment handling will be required, so the potential for fugitive dust and air emissions impacts exists. Depending on the effectiveness of dewatering of sediment, there is a potential for downstream contaminant transport.

Implementability

Alternative 4 is the most technically challenging alternative to implement. Treatability testing is required to validate using the phytoremediation technologies on NSN Site 2 sediment and to confirm the technologies can meet the lead clean-up level.

Dewatering sediment may pose some significant implementation challenges under both Alternatives 3 and 4.

Cost

Table 2-9 presents a comparative cost summary of all four alternatives

TABLE 2-9
Summary of Comparative Analysis of Sediment and Surface Water Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation, Off-Site Disposal, and Monitoring	Alternative 4 Excavation, On-Site Phytoremediation, and Monitoring
Overall Protection of Human Health and the Environment				
Exposure to contaminated Sediment and Surface Water	Does not reduce exposure to contaminated sediment and surface water and thus does not reduce risk to human health and the environment. This remedy is not protective.	Does not reduce exposure to contaminated sediment and surface water and thus does not reduce risk to human health and the environment. This remedy is not protective.	Exposure to contaminated sediment will be prevented because sediment contamination above the lead clean-up level will be excavated and disposed of in an off-site landfill. In locations where it is too deep to excavate, the sediment contamination will be covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill. The cover layer will reduce exposure to any remaining contaminated sediment. Remediation of Site 2 sediment will result in reduced contaminant levels in the surface water.	Exposure to contaminated sediment will be prevented because sediment contaminants will be excavated and treated to at least meet the lead clean-up level. Access restrictions may be required during remediation to protect ecological and human receptors from coming into contact with the excavated sediment while it is undergoing on-site treatment. In locations where it is too deep to excavate, the sediment contamination will be covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill. The cover layer will reduce exposure to any remaining contaminated sediment. Remediation of Site 2 sediment will result in reduced contaminant levels in the surface level.
Compliance with ARARs/ TBCs				
Chemical-Specific TBCs	Does not meet chemical-specific TBCs.	Does not meet chemical-specific TBCs.	Chemical-specific TBCs for the sediment would be met because contaminant concentrations above lead clean-up level would be excavated and disposed of off-site or covered with an engineered cover layer. Remediation of Site 2 sediment will result in reduced contaminant levels in the surface water.	Chemical-specific TBCs for the sediment would be met because excavation and phyto-remediation will reduce concentrations to below the lead clean-up level. Treatability studies would be required to ensure the treatment technology can meet the lead clean-up level cost-effectively. Deeper contamination may be covered with an engineered cover layer. Remediation of Site 2 sediment will result in reduced contaminant levels in the surface water.
Location-Specific ARARs	Not applicable; no action undertaken	Not applicable.	Compliance with ARARs.	Compliance with ARARs.
Action-Specific ARARs	Not applicable; no action undertaken.	Not applicable.	Compliance with ARARs.	Compliance with ARARs.

TABLE 2-9
Summary of Comparative Analysis of Sediment and Surface Water Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation, Off-Site Disposal, and Monitoring	Alternative 4 Excavation, On-Site Phytoremediation, and Monitoring
Long-Term Effectiveness and Permanence				
Residual Risk Remaining from Any Untreated Waste or Treatment Residues at Completion of Remedial Activities	Source not remediated; risk remains.	Source not remediated; risk remains.	There may be some residual risk associated with sediment contamination in locations where it is too deep to excavate; however, such sediment contamination will be covered with an engineered cover layer. Residual risk will be reduced in the surface water, since surface water in the drainage channel will not come into contact with contaminated sediment.	Residual risk will be reduced because the sediment would be treated, and residual contaminant concentrations will at least meet the lead clean-up level. There may be residual risk from arsenic, 4,4'-DDD, and 4,4'-DDE, which cannot be treated through phytoremediation. In addition, there may be some residual risk associated with sediment contamination in locations where it is too deep to excavate; however, such sediment contamination will be covered with an engineered cover layer. Residual risk will be reduced in the surface water, since surface water in the drainage channel will not come into contact with contaminated sediment.
Long-Term Reliability of Remedial Action To Provide Continued Protection from Any Untreated Waste or Treatment Residues	Source not remediated; long-term risk remains.	Source not remediated; long-term risk remains.	The long-term reliability of the remedial action is high, since the contaminated sediment would be excavated and disposed of off-site. The engineered cover layer will provide long-term protection from any contaminated sediment that remains on-site, provided that the cover layer is maintained. Failure to maintain the cover layer can increase potential for direct contact with contaminants remaining on-site.	The long-term reliability of the remedial action is high, since the contaminated sediment would be excavated and treated. The engineered cover layer will provide long-term protection from any contaminated sediment that remains on-site, provided that the cover layer is maintained. Failure to maintain the cover layer can increase potential for direct contact with contaminants remaining on-site.
Need for Five-Year Review	Not applicable.	Because contaminated material remains on-site, five-year reviews would be required to ensure that adequate protection of human health and the environment is maintained.	Five-year reviews will need to be conducted to ensure that the channel has not been re-contaminated by soil from the west bank of the upstream section of the drainage channel adjacent to the NM slag pile area.	Monitoring will be required during phytoremediation treatment. In addition, five-year reviews would need to be conducted to ensure that the channel has not been re-contaminated by soil from the west bank of the upstream section of the drainage channel immediately adjacent to the NM slag pile area.

TABLE 2-9
Summary of Comparative Analysis of Sediment and Surface Water Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation, Off-Site Disposal, and Monitoring	Alternative 4 Excavation, On-Site Phytoremediation, and Monitoring
Reduction of Toxicity, Mobility, or Volume Through Treatment				
Degree to which the Toxicity, Mobility, or Volume of Hazardous Substances Are Reduced Through Treatment	None.	None.	No treatment of contaminants in the sediment or surface water will be performed.	Toxicity and volume of contaminants in sediment will be reduced by phytoremediation, with the exception of arsenic, 4,4'-DDD, and 4,4'-DDE.
Irreversible Treatment	Not applicable.	Not applicable.	Not applicable.	Phytoremediation is irreversible.
Type and Quantity of Residuals Remaining After Remediation	No treatment undertaken; therefore, all contaminants will remain on-site.	No treatment undertaken; therefore, all contaminants will remain on-site.	Sediment contamination above the lead-clean-up level may remain at Site 2 in locations where it is too deep to excavate; however, any such sediment contamination will be covered with an engineered cover layer. Contaminants in the surface water will be reduced, since surface water in the drainage channel will not come into contact with contaminated sediment after it has been excavated or covered.	Sediment contamination may remain at Site 2, because arsenic, 4,4'-DDD, and 4,4'-DDE cannot be treated through phytoremediation. In addition, sediment contamination may remain in locations where it is too deep to excavate; however, any such sediment contamination will be covered with an engineered cover layer. Contaminants in the surface water will be reduced, since surface water in the drainage channel will not come into contact with contaminated sediment after it has been excavated or covered.
Statutory Preference for Treatment	Does not satisfy preference	Does not satisfy preference	Does not satisfy preference	Satisfies treatment preference.
Short-Term Effectiveness				
Short-Term Risks to the Community and Impacts on Workers and the Environment During Remediation Implementation	No action undertaken.	This remedy does not add to risk.	Temporary increase in fugitive dust emissions during excavation and transport of sediment. Also, potential for downstream contamination transport, depending on the effectiveness of dewatering of sediment.	Temporary increase in fugitive dust emissions during excavation of sediment. Also, potential for downstream contamination transport, depending on the effectiveness of dewatering of sediment.
Expected Time Until Action Is Complete	No time required.	1 month.	2 months.	9 months (anticipated total time for on-site treatment of the sediment is one growing season).
Implementability				
Technical Feasibility — The Ability to Construct and Operate the Remedial Action	No construction or operation required.	No construction or operation required.	Excavation and off-site disposal are easy to implement; however, both access and dewatering may pose significant challenges because of the close proximity of the adjacent jurisdictional wetlands.	A treatability study is required for the phytoremediation process. Excavation is easy to implement; however, both access and dewatering may pose significant challenges because of the close proximity of the adjacent jurisdictional wetlands.

TABLE 2-9
Summary of Comparative Analysis of Sediment and Surface Water Alternatives
NM Slag Pile (Site 2), Naval Station Norfolk, Norfolk, Virginia

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation, Off-Site Disposal, and Monitoring	Alternative 4 Excavation, On-Site Phytoremediation, and Monitoring
Ease of Doing More Action if Needed	Very easy to implement additional action.	Very easy to implement additional action.	Difficult to implement additional action for the soil that will be disposed of in an off-site landfill. Easy to implement additional action at the site.	Easy to implement additional action for treated material.
Ability to Monitor Effectiveness	Easily monitored.	Easily monitored.	Easily monitored. Monitoring would be required because contamination in the sediment above the lead clean-up level may remain on-site.	Easily monitored during the duration of phytoremediation treatment. Monitoring also would be required because contamination in the sediment above the lead clean-up level may remain on-site.
Administrative Feasibility—The Ability and Time Required To Obtain Any Approvals and Permits from Regulatory Agencies	Not applicable.	Not applicable.	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. The small wetland area adjacent to the site will not be disturbed. No permitting is anticipated.	Same as Alternative 3.
Availability of Services, Equipment, and Materials	Not applicable.	Not applicable.	Services, equipment, and materials are readily available for all aspects of remediation, including bank stabilization.	Specialty contractor required for phytoremediation. Contractors are available for both phytoremediation and bank stabilization.
Cost				
Estimated Capital Cost	$0	$0	$270,000 - $590,000	$300,000
Estimated Annual O&M Costs[1]	$0	$10,400	$10,400	$10,400
Estimated Net Present-Worth Cost	$0	$29,000	$320,000 - $630,000[2]	$340,000[3]

[1] Monitoring assumed to occur annually for five years after the sediment is excavated.

[2] The magnitude of the estimated net present-worth range for Alternative No. 3 depends on whether the excavated waste is hazardous. The higher cost for hazardous waste disposal is attributed to the higher transportation and treatment/disposal costs. The cost range assumes that 100 percent of the waste is hazardous (resulting in the higher estimated net present worth) or 100 percent of the waste is nonhazardous (resulting in the lower estimated net present worth). Monitoring assumed to occur annually for a duration of five years, for cost-estimating purposes.

[3] The cost for Alternative No. 4 assumes that treated sediment can be left in place on-site after lead levels are reduced below 218 mg/kg. Monitoring assumed to occur annually for a duration of five years, for cost-estimating purposes.

2.8 The Selected Remedy

The selected remedy for Site 2 is identified below:

Subsurface Soil – Alternative 3: Asphalt and Soil Cover, Institutional Controls, and Long-term Monitoring

Groundwater – Alternative 3: Asphalt and Soil Cover, Long-term Monitoring, and Institutional Controls

Sediment and Surface Water – Alternative 3: Excavation, Off-site Disposal, and, Monitoring

A description of the selected remedy is presented below. Monitoring programs and institutional controls associated with each media are described in Section 2.8.4.

2.8.1 Selected Subsurface Soil Remedy

The selected subsurface soil remedy for Site 2 is Alternative 3, consisting of constructing an asphalt and soil cover, long-term monitoring, and implementing institutional controls.

The major components of the selected subsurface soil remedy are the following:

Asphalt and Soil Cover – The Navy shall construct an asphalt and soil cover over the contaminated soil area, as shown in Figure 2-3. The soil will be compacted and graded to act as a proper subbase. The asphalt cover will be constructed over the existing gravel parking lot and will consist of asphalt pavement. The asphalt cover will be gently sloped to prevent surface water ponding. The extent of the asphalt cover will provide for continued use as a parking lot. The soil cover will be constructed over the remainder of the contaminated area, which is vegetated by grass.

Long-term (Groundwater) Monitoring Program –The Navy shall conduct a groundwater monitoring program to track future contaminant migration. The groundwater monitoring requirements are described in Section 2.8.4, Performance Standards, below.

Institutional Controls – The selected subsurface soil remedy shall include implementing land use controls, as described in Section 2.8.4, below.

2.8.2 Selected Groundwater Remedy

The selected groundwater remedy for Site 2 is Alternative 3, consisting of constructing an asphalt and soil cover, long-term monitoring, and institutional controls. The major components of the selected groundwater remedy are the following:

Asphalt and Soil Cover – The asphalt and soil cover is described in Section 2.8.1, above.

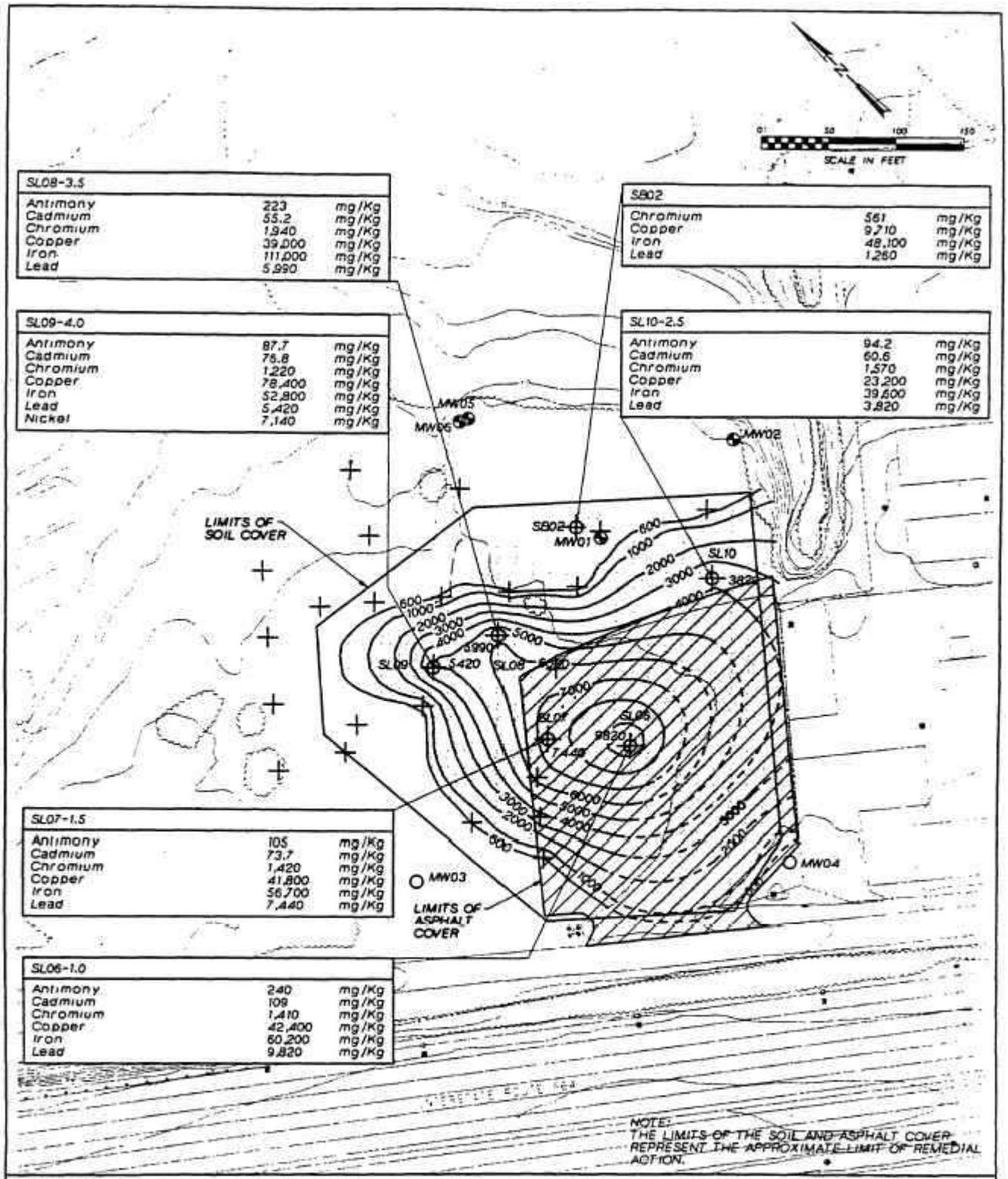


Figure 2-3

AERIAL EXTENT OF ASPHALT & SOIL COVER, CONTOUR PLOT OF LEAD CONCENTRATIONS IN SUBSURFACE SOIL SAMPLES, LOCATIONS OF PRG® EXCEEDANCES, AND LOCATIONS OF GROUNDWATER MONITORING WELLS, NM SLAG PILE (Site 2), Naval Station, Norfolk

CH2MHILL

06-OCT-2000 8652f98b.dlv

Long-Term (Groundwater) Monitoring Program – The Navy shall conduct a groundwater monitoring program to track future contaminant migration. The groundwater monitoring requirements are described in Section 2.8.4, Performance Standards, below.

Institutional Controls – The selected groundwater remedy shall include implementing land use controls, as described in Section 2.8.4, below.

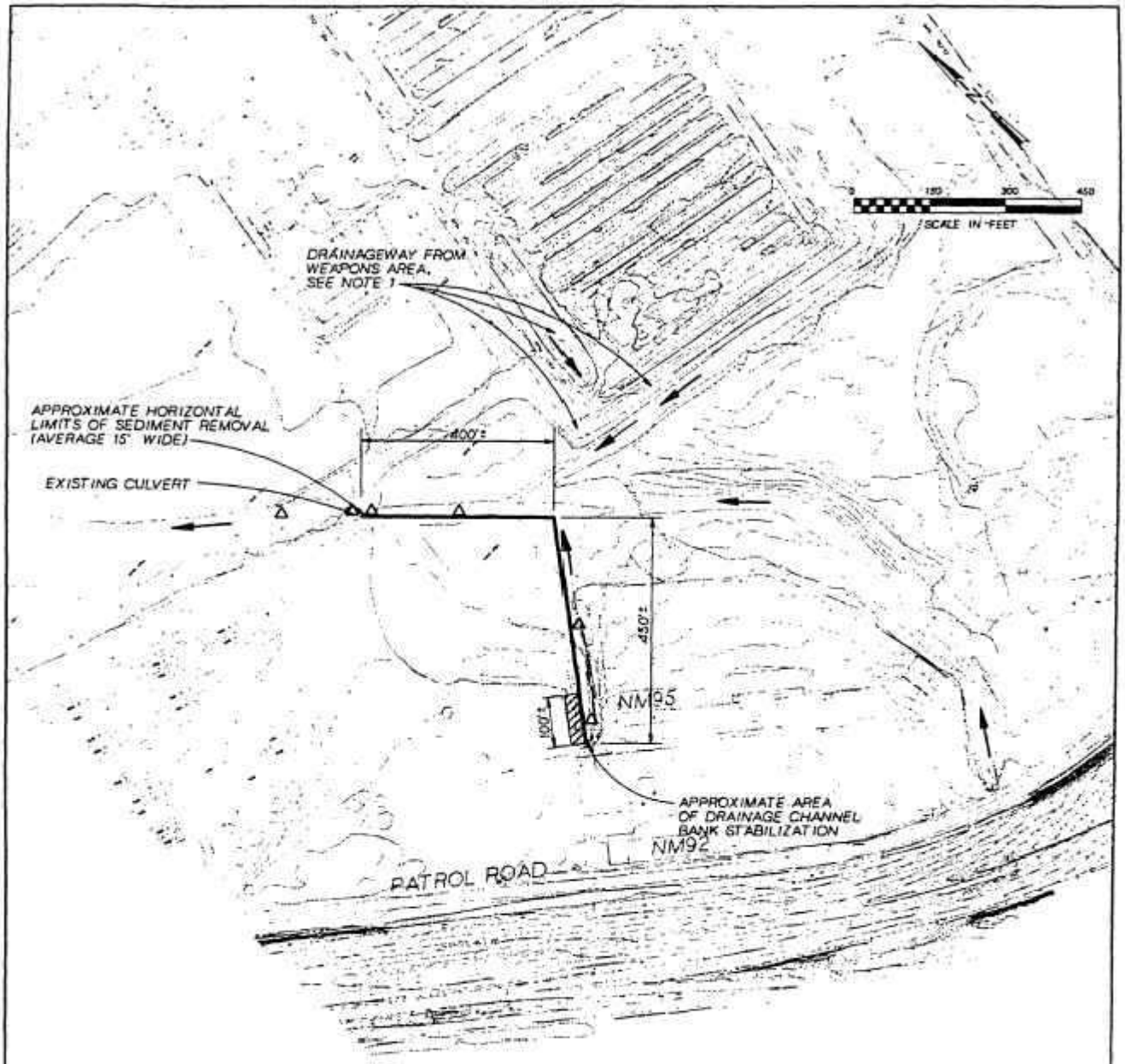
This selected groundwater remedy will provide overall protection through long-term monitoring of contaminant levels and through preventing potential consumption of groundwater.

2.8.3 Selected Sediment and Surface Water Remedy

The selected sediment and surface water remedy for Site 2 is Alternative 3, consisting of excavation and off-site disposal of sediments, bank stabilization, and monitoring. Figure 2-4 shows the approximate horizontal limits of excavation, area of drainage channel bank stabilization, and sediment and surface water monitoring locations. The major components of the selected sediment and surface water remedy are as follows:

Excavation and Off-site Disposal – The contaminated sediment in the drainage channel adjacent to the slag pile will be excavated to a depth of its interface with the underlying soil. A minimum of ten confirmatory samples will be collected and analyzed. If the confirmatory samples indicate that lead levels in the remaining sediment in sections of the drainage channel are above the remediation level of 218 mg/kg, additional sediment will be removed until a minimum of two feet of sediment has been excavated. If compliance with the cleanup level is not demonstrated following excavation of two feet of sediment, a design alternative has been developed to avoid over-excavating potentially contaminated material and handling and disposing of excessive quantities of sediment. If, following excavation of two feet of sediment, contamination above the cleanup level for lead is present in the sediment, the area may be covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill. Portions of the channel may be excavated to native soil, and portions may be covered with the engineered cover alternative after a minimum two-foot excavation. The decision will be made by the Navy based on actual field conditions during construction.

The excavated sediment will be dried (dewatered) and tested to determine if it is hazardous by characteristic in accordance with the RCRA regulations at 40 CFR Part 261, Subpart C. If the excavated sediment is determined to be hazardous waste by characteristic, it will be stored on-site in accordance with 40 CFR Part 264, Subpart I, prior to being transported to an appropriate off-site disposal facility permitted under Subtitle C of RCRA, 42 U.S.C § 6925, and in compliance with the RCRA regulations at 40 CFR Part 264. If the sediment is determined not to be hazardous by characteristic, it will be transported to an off-site RCRA Subtitle D solid waste disposal facility.



NOTES:

1. DRAINAGE CHANNELS FROM WEAPONS AREA HAVE BEEN SAMPLED AND WERE BELOW CLEAN-UP CRITERIA.

LEGEND

- SURFACE WATER FLOW DIRECTION
- HORIZONTAL LIMIT OF SEDIMENT REMOVAL
- AREA OF DRAINAGE CHANNEL BANK STABILIZATION
- △ PROPOSED SEDIMENT AND SURFACE WATER MONITORING LOCATIONS

Figure 2-4
APPROXIMATE LIMITS OF SEDIMENT EXCAVATION, AREA OF BANK STABILIZATION, AND MONITORING LOCATIONS
NM AREA SLAG PILE
(SITE 2), Naval Station, Norfolk

CH2MHILL

06-OCT-2000 86521099.div

Bank Stabilization – The west bank of the upstream section of the drainage channel immediately adjacent to the NM slag pile area will be stabilized to prevent contaminated soil from migrating into the drainage channel and to prevent further migration of contaminated sediment from Site 2. The bank will be re-graded and protected from future erosion by seeding and by installing erosion control matting or riprap for a distance of about 100 feet as shown in Figure 2-4.

Sediment and Surface Water Monitoring Program – The Navy shall conduct a sediment and surface water monitoring program to confirm that the drainage channel has not been recontaminated. The sediment and surface water monitoring requirements are described in Section 2.8.4, below.

2.8.4 Performance Standards

Asphalt and Soil Cover Design Criteria – The asphalt cover will be constructed over the existing gravel parking lot (one acre in area) as shown in Figure 2-3, and shall include construction of durable, flexible pavement that resists cracking. The asphalt cover will be a minimum of two inches thick. The soil cover, consisting of clean fill, will be constructed over the grassy field as shown in Figure 2-3, and will be a minimum of one foot thick. The asphalt and soil cover shall prevent direct contact with the underlying slag pile soil, and shall control surface water runon and runoff.

Sediment Excavation Design Criteria – The excavation design shall include the following performance standards:

- Excavate contaminated sediment in the drainage channel adjacent to the slag pile to meet the remediation level of 218 mg/kg for lead. If, after two feet of sediment have been excavated, compliance with the remediation level is not demonstrated, a design alternative has been developed to avoid over-excavating potentially contaminated material and handling and disposing of excessive quantities of sediment. At the direction of the Navy, if two feet of sediment has been excavated and the remediation level of 218 mg/kg for lead has not been reached, then the area may be backfilled with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill to prevent future migration of sediment. Portions of the channel may be excavated to native soil, and portions may be covered with the engineered cover alternative after a minimum two-foot excavation. The decision will be made by the Navy based on actual' field conditions during construction. Figure 2-4 shows the approximate horizontal limits of excavation.

During the course of remedial action, the following steps will be taken to minimize impacts on the environment:

- The removal of larger trees will be avoided, where possible.

- Fixed routes of ingress and egress will be established and maintained during the remedial action.

- Work will be conducted such that, to the extent practical, only the north and east sides of the channel are disturbed.

Bank Stabilization – The west bank of the upstream section of the drainage channel immediately adjacent to the NM slag pile area will be re-graded and protected from future erosion by seeding and by installing erosion control matting or riprap, for a distance of about 100 feet as shown in Figure 2-4.

Groundwater Monitoring – The groundwater monitoring program shall start after the asphalt and soil cover is constructed, and shall include the following:

- Annual unfiltered and filtered groundwater sampling for inorganics analysis for the first five years, to ensure that inorganic contamination is not increasing over time.

- Collecting samples from the following six existing groundwater monitoring wells: MW01, MW02, MW03, MW04, MW05, and MW06 (shown in Figure 2-3).

- After an analysis of the first five years of groundwater monitoring data, changing the sampling frequency to collecting unfiltered and filtered groundwater samples for inorganics analysis once every five years thereafter.

Sediment and Surface Water Monitoring – The sediment and surface water monitoring program shall start after the contaminated sediment is excavated. Sediment and surface water samples will be collected at six representative locations ,every year for the first 5 years (after the sediment is excavated) and analyzed for inorganics: Sample locations were determined based on past analytical results. Sample locations are within and downgradient of the remedial action. Locations were chosen such that they can be sampled over time (to conduct a trend analysis).

Land Use Controls (Institutional Controls) – The Navy will limit the uses of Site 2 to reduce to the greatest extent practical the risk that contaminants of concern (COCs) left in place may cause a threat to human health or the environment. The following land use control (LUC) objectives for Site 2 have been selected. The Navy will prohibit: 1) excavating or disturbing the asphalt and soil covers, provided the sewage main traversing the site may be maintained from time to time, as necessary or appropriate; 2) the use of groundwater underlying the site for drinking water; and 3) any other activity that would disturb the integrity of the asphalt and soil covers or impair the function of groundwater monitoring systems.

Within 270 days of the execution of this ROD, the Navy, in consultation with the Commonwealth of Virginia and with the concurrence of the EPA, Region III, will develop a land use control implementation plan (LUCIP) for the site. The LUCIP will include the following:

1. A description of the site, including information on prior use, approximate size, and COCs remaining in the ground;

2. The location of Site 2;

3. The LUC objectives set out above;

4. The actual LUCs the Navy will implement;

5. A reference to this ROD; and

6. Any other pertinent information.

The Navy, in consultation with the Commonwealth of Virginia and with the concurrence of the EPA, Region III, will develop a land use control assurance plan memorandum of agreement (MOA) for Naval Station Norfolk. The MOA will contain Station-wide inspection, certification, and notification procedures designed to effect the LUCIP. The MOA will provide reasonable assurances to EPA, Region III and the Commonwealth of Virginia that the Navy will maintain the chosen LUCs indefinitely, or until such time as they are no longer required to protect human health or the environment.

Although the terms and conditions of the MOA will not be specifically incorporated or made enforceable in this or any other ROD, it is understood and agreed by the Navy, EPA, and the Commonwealth of Virginia, that the contemplated permanence of the remedy selected herein depends upon the Navy's good-faith compliance with its commitment to implement and maintain LUCs appropriate to the land use control objectives stated above. Should such compliance not occur or should the MOA herein contemplated be terminated, the EPA, Region III and the Commonwealth of Virginia may reconsider the adequacy of the remedy herein selected and may prescribe additional measures to' protect human health and the environment.

2.9 Statutory Determinations

A selected remedy must satisfy the statutory requirements of Section 121 of CERCLA, 42 U.S.C. § 9621, which include the following:

- Overall protection of human health and the environment
- Compliance with ARARs (or justification of a waiver)
- Cost-effectiveness
- Use of permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable
- Preference for treatment that reduces toxicity, mobility, or volume as a principal element, or explanation as to why this preference is not satisfied

The evaluation of how the selected remedy for Site 2 satisfies these requirements is presented below.

2.9.1 Overall Protection of Human Health and the Environment

The selected remedy will protect human health and the environment. The asphalt and soil cover and land use controls will prevent direct contact with contaminated soil at Site 2. If excavation is required (e.g., during maintenance of the sanitary force main on-site), necessary precautions would have to be taken to ensure the workers are protected. In addition, installing an asphalt and soil cover over the subsurface soil contamination will limit downward percolation of precipitation into the water table aquifer at Site 2. Groundwater monitoring at Site 2 will provide a warning mechanism for potential groundwater contamination and ensure the asphalt and soil cover is effective in protecting human health. Since the remedy will leave contaminated soil at the site, the remedial action will be reviewed no less often than every five years after its initiation to ensure continued protection of human health and the environment.

Contact with contaminated sediment will be prevented because contamination above the lead cleanup level will be excavated and disposed of in an off-site landfill. In locations where it is too deep to excavate, contact with contaminated sediment will be prevented because the contaminated sediment will be covered with an engineered cover layer consisting of a bi-directional geogrid material and clean backfill. Remediation of Site 2 sediment will result in a reduction of contaminant levels in the surface water since surface water in the drainage channel will no longer come into contact with contaminated sediment. Monitoring of sediment and surface water will be conducted annually for the first five years after excavation of the sediment to confirm that the channel has not been re-contaminated.

2.9.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with applicable or relevant and appropriate requirements. Chemical-specific ARARs/TBCs are identified in Section 2.3 and location- and action-specific ARARs are presented in Appendix A.

2.9.3 Cost-Effectiveness

The selected remedy provides overall cost-effectiveness compared with all the alternatives developed for soil, with the exception of the no-action alternative. However, the no-action alternative does not meet all the NCP criteria. The estimated total net present-worth cost of the selected subsurface soil remedy in this ROD is $573,000. Since the selected remedy for groundwater is the same as the selected remedy for subsurface soil, there will be no additional costs to implement the groundwater remedy.

The estimated total net present-worth cost range of the selected sediment and surface water remedy in this ROD is $320,000 (assuming that the sediment is characterized as nonhazardous) to $630,000 (assuming that the sediment is characterized as hazardous), which also provides overall cost-effectiveness compared with all the alternatives developed for sediment and surface water, with the exception of the no action alternative. However, the no action alternative does not meet all the NCP criteria. The estimated net present-worth cost range of the entire selected remedy for the site is $893,000 to $1,203,000, depending on whether the excavated sediment is characterized as nonhazardous or hazardous, respectively.

2.9.4 Use of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy uses permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable at Site 2. The selected asphalt and soil cover and sediment excavation with off-site disposal are permanent solutions; however, treatment of the soil is not practicable because of the large volume of contaminated soil (which resulted in treatment alternatives that were not cost-competitive with the selected remedy).

Alternative 4 for sediment and surface water, which includes treatment of contaminated sediment by phytoremediation, was not selected for sediment remediation because arsenic, 4,4'-DDD, and 4,4'-DDE cannot be treated through phytoremediation.

2.9.5 Preference for Treatment as a Principal Element

The selected remedy does not satisfy the preference for remedies using, as a principal element, treatment that permanently and significantly reduces the toxicity, mobility, or volume of the hazardous substances, pollutants, or contaminants. The selected remedy represents a better balance of trade-offs under the evaluation criteria than the alternatives using treatment. The large volume of contaminated soil resulted in treatment alternatives that were not cost-competitive with the selected remedy.

Alternative 4 for sediment and surface water, which includes treatment of contaminated sediment by phytoremediation, was not selected for sediment remediation because arsenic, 4,4'-DDD, and 4,4'-DDE cannot be treated through phytoremediation.

2.10 Documentation of Significant Changes

Although the Selected Remedy for Site 2 set forth in this ROD is the same as the Preferred Alternatives set forth in the PRAP, except for the significant changes noted below, the numbering of the remedial alternatives for (a) subsurface soil and (b) sediment and surface water, changed from the PRAP to this ROD. In the PRAP, Remedial Alternative 1 for both (a) subsurface soil and (b) sediment and surface water was a "No Action" alternative; however, the PRAP described the "No Action" alternative as including land use restrictions. An alternative that includes land use restrictions (institutional controls) is considered to include an action; therefore, it cannot be considered a "No Action" alternative. Consequently, the list and numbering of alternatives for (a) subsurface soil and (b) sediment and surface water has been revised in this ROD so that Alternative 1 is a "No Action" alternative and Alternative 2 is an "Institutional Controls" alternative for these media. This, in turn, resulted in a re-numbering of the other alternatives, so that Remedial Alternative 2 (the Preferred Alternative) for subsurface soil in the PRAP became Remedial Alternative 3 (the Selected Remedy) for subsurface soil in this ROD, and Remedial Alternative 2 (the Preferred Alternative) for sediment and surface water in the PRAP became Remedial Alternative 3 (the Selected Remedy) for sediment and surface water in this ROD. The other alternatives for these media were re-numbered accordingly. This matter did not affect the remedial alternatives for groundwater.

The selected remedy for Site 2 set forth in this ROD is the same as the preferred alternatives presented in the PRAP, with two exceptions. The first change concerns the type of cover being placed over the contaminated soil. The Navy, EPA, and VDEQ discussed the need for an asphalt cover over the entire area (Alternative 2 for subsurface soil in the PRAP), and agreed to a technical change in the cover requirements. The requirement for an asphalt cover over the existing gravel parking area remains, but a soil cover will be provided instead of the asphalt cover over the grassy field, as presented in Alternative 3, Asphalt and Soil Cover, Institutional Controls, and Long-Term Monitoring, in this ROD. The purpose of the cover is to reduce exposure to site contaminants, and a soil cover provides the same amount of protection as an asphalt cover by limiting access to the surface soils. A soil cover, which also serves as a grassy field, is more attractive and environmentally friendly than a paved area. It also provides a cost savings over an asphalt cover in that part of the site.

The second change concerns the frequency of sediment and surface water monitoring. The PRAP stated that such monitoring would be conducted every year for the first five years, and every five years thereafter for the full 30-year study period. As part of the selected remedy, contaminated sediments will be removed and the eroding bank will be stabilized. The only contamination that may be left in place will be in subsurface soil beneath the soil and asphalt cover. Because of this, the selected remedy set forth in this ROD includes sediment and surface water monitoring annually for the first five years, but does not include monitoring beyond the first five years. An evaluation of sediment and surface water contamination will be made at the five-year review.

This Page Intentionally Left Blank

3.0 Responsiveness Summary

The final component of this ROD is the responsiveness summary. A notice of availability of the 1998 RI, FS, and PRAP was published in the Virginian Pilot from December 28, 1998, to December 30, 1998. The notice requested that written comments, concerns, and questions about the site be submitted during the public comment period, which was held from December 28, 1998, to January 28, 1999. A public meeting was conducted on January 21, 1999, at the Navy Lodge in Norfolk, Virginia, to formally present the PRAP and to answer questions and receive comments. No one from the local community attended the meeting and no comments or questions were raised. This responsiveness summary is divided into the following sections:

- Overview
- Background on Community Involvement
- Summary of Comments Received During the Public Comment Period and Agency Responses

3.1 Overview

At the time of the public meeting on January 21, 1999, the Department of the Navy had endorsed the preferred alternatives in the PRAP to address the contamination in the subsurface soil, groundwater, sediment, and surface water. The preferred alternative in the PRAP for subsurface soil required construction of an asphalt cover over the contaminated soil area, institutional controls to prevent excavation or disturbance of the covered area, and long-term groundwater monitoring. The preferred alternative for groundwater required the same components as the preferred alternative for the subsurface soil. The preferred alternative for sediment and surface water required excavation and off-site disposal of the contaminated sediment, stabilizing the west bank of the upstream section of the drainage channel adjacent to the NM slag pile area, and sediment and surface water monitoring. The preferred alternative for the sediment and surface water also included an option to construct an engineered cover layer of a geogrid material over the remaining sediment if the clean-up level is not reached after two feet of sediment have been excavated. EPA Region III and the Commonwealth of Virginia concurred with the preferred alternatives presented in the PRAP.

No comments were received during the public comment period (held from December 28, 1998, to January 28, 1999) or at the public meeting (held on January 21, 1999).

3.2 Background on Community Involvement

The Community Relations Plan (CRP) for NSN was finalized in May 1993. Before the CRP was finalized, community interviews were conducted to provide information on site activities and to encourage community involvement. The Navy has established a Restoration Advisory Board (RAB) for NSN to provide a forum for cooperation between the Navy, EPA, and the local community. The RAB is composed of agency representatives, technical and business persons, and members of the community. Meetings are held regularly and proposed actions are described to the community. The community is given site tours of new treatment facilities as these facilities are placed in operation. An information brochure describing recent cleanup activities was prepared in 1997 for members of the RAB and other interested persons in the local community. This brochure described project highlights and cost and time savings achieved through team partnering at the NSN.

3.3 Summary of the Comments Received During the Public Comment Period and Agency Responses

The public comment period on the 1998 RI, FS, and PRAP was held from December 28, 1998, to January 28, 1999. No comments were received from the public during the public comment period.

4.0 References

CH2M HILL, August 1998. Final Remedial Investigation (RI) of the NM Slag Pile, Naval Base, Norfolk, Norfolk, Virginia.

CH2M HILL, September 1998. Final Feasibility Study, NM Slag Pile, Naval Base, Norfolk, Norfolk, Virginia.

Long, E.R., D.D. MacDonald, S.L. Smith and F.D. Calder. 1995. Incidence of Adverse Biological Effects Within Ranges of Chemical Concentrations in Marine and Estuarine Sediments. Environmental Management 19 (1): 81-97.

Naval Base, Norfolk, Partnership Human Health Consensus Agreement No. 6.C, August 1997.

Naval Base, Norfolk, 2010 Land Use Plan, August 1995.

EPA. June 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, U.S. Environmental Protection Agency.

EPA. December 1996. Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. Technical Review Workgroup for Lead, U.S. Environmental Protection Agency.

A.T. Kearney, Inc. March 1992. Revised Final Phase II RCRA Facility Assessment of the Norfolk Naval Base — Sewell's Point, Norfolk, Virginia.

EPA. 1989. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA - Interim Final. OSWER Directive 9355.3-01. EPA/540/G-89/004.

Malcolm Pirnie, Inc. March 1988. Installation Restoration Program Remedial Investigation Interim, Report, Naval Base, Norfolk, Norfolk, Virginia.

ESE. February 1983. Initial Assessment Study of the Sewell's Point Naval Complex, Norfolk, Virginia.

This Page Intentionally Left Blank

Appendix A

Location- and Action-Specific Applicable or Relevant and Appropriate Requirements

Table A-1a
Potential Federal Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
National Archaeological and Historic Preservation Act					
Within area where action may cause irreparable harm, loss, or destruction of significant artifacts	Construction on previously undisturbed land would require an archaeological survey of the area.	Alteration of terrain that threatens significant scientific, prehistoric, historic, or archaeologic data.	36 CFR 65; 16 USC 469	Not applicable	Construction will not be occurring on previously undisturbed land. No known buildings or archaeological sites have been documented for this area. If archaeological artifacts are found, the Navy will stop construction.
Endangered Species Act of 1973*					
Critical habitat upon which endangered species or threatened species depend	Action to conserve endangered species or threatened species, including consultation with the Department of the Interior. Reasonable mitigation and enhancement measures must be taken, including live propagation, transplantation, and habitat acquisition and improvement.	Determination of the effect on endangered or threatened species or its habitat by conducting biological assessments.	16 USC 1531; 16 USC 1536(a); 50 CFR 81, 225, 402	Not applicable	Although no endangered or threatened animal species have been observed within the area of Site 2, if a determination is made during design or construction that the work will impact any endangered or threatened species, then work will be halted or modified until a biological assessment is conducted.
Migratory Bird Treaty Act of 1972*					
Migratory bird area	Protects almost all species of native birds in the U.S. from unregulated "taking" which can include poisoning at hazardous waste sites.	Presence of migratory birds.	16 USC Section 703	Applicable	Migratory birds have been located at Site 2. The requirements of this regulation will be incorporated into the response action and if any species of migratory birds are identified then the construction sequence will be modified for their protection.
Fish and Wildlife Coordination Act, Fish and Wildlife Improvement Act of 1978, Fish and Wildlife Conservation Act of 1980*					
Area affecting stream or other water body	Provides protection for actions that would affect streams, wetlands, other water bodies, or protected habitats. Any action taken should protect fish or wildlife.	Diversion, channeling, or other activity that modifies a stream or other water body and affects fish or wildlife.	16 USC 661; 16 USC 662; 16 USC 742(a); 16 USC 2901; 50 CFR 83.	Applicable	Remedial activities occurring at Site 2 will incorporate the requirements of this regulation (for the protection of fish and wildlife) and any action taken should be designed to protect any natural habitat. This will include relocating fish or other habitat to an undisturbed section of the stream

Table A-1a
Potential Federal Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
Procedures for Implementing the Requirements of the Council of Environmental Quality on the National Environmental Policy Act and Executive Order 11990, Protection of Wetlands*					
Wetland	Action to minimize the destruction, loss, or degradation of wetlands. Wetlands of primary ecological significance must not be altered so that ecological systems in the wetlands are unreasonably disturbed.	Wetland as defined by Executive Order 11990 Section 7.	40 CFR 6, Appendix A; excluding Sections 6(a)(2), 6(a)(4), 6(a)(6); 40 CFR 6.302	Not applicable	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. Precautions will be taken so that the small wetland area adjacent to the site will not be disturbed.
Clean Water Act, Section 404*					
Wetland	The degradation Section requires degradation or destruction of wetlands and other aquatic sites be avoided to the extent possible. Dredged or fill material must not be discharged to navigable waters if the activity: contributes to the violation of the Virginia water quality standards; CWA Sec. 307; jeopardizes endangered or threatened species; or violates the requirements of Title III of the Marine Protection, Research, and Sanctuaries Act of 1972.	Wetland as defined by Executive Order 11990 Section 7.	40 CFR 230.10; 40 CFR 231 (231.1, 231.2, 231.7, 231.8)	Not applicable	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. The small wetland area adjacent to the site will not be disturbed.
Coastal Zone Management Act*					
Within the coastal zone	Regulates activities affecting the coastal zone, including lands thereunder and adjacent shoreland. The coastal zone is rich in a variety of natural, commercial, recreational, ecological, industrial, and aesthetic resources of immediate and potential value to the present and future well-	Activities affecting the coastal zone, including lands thereunder and adjacent shoreland.	Section 307(c) of 16 USC 1456(c); 16 USC 1451 et seq.; 15 CFR 930; 15 CFR 923.45	Applicable	Site 2 is located within Virginia's coastal zone, therefore the requirements of this regulation will be incorporated into the response actions. The remedial action will be conducted c onsistent with State of Virginia management programs.

Table A-1a
Potential Federal Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
	being of the Nation. Must conduct activities in a manner consistent with approved State management programs.				

*Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that DON accepts the entire statues or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs.

ARARs - Applicable or relevant and appropriate requirements.
CFR - Code of Federal Regulations.
CWA - Clean Water Act.
EO - Executive Order.
EPA - Environmental Protection Agency.
FR - Federal Register
RCRA - Resource Conservation and Recovery Act.
USC - United States Code.

Table A-2a
Potential Federal Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisite	Citation	ARAR Determination*	Comments
Resource Conservation and Recovery Act (RCRA) 42 USC 6901 et seq.					
Onsite waste generation	Waste generator shall determine if that waste is hazardous was te.	Generator of hazardous waste.	40 CFR 262.10(a); 262.11	Not applicable	Applicable for any operation where waste is generated. Excavated materials were determined not to be RCRA hazardous waste.
Hazardous waste accumulation	Generator may accumulate waste on-site for 90 days or less or must comply with requirements for operating a storage facility.	Accumulate hazardous waste.	40 CFR 262.34	Not applicable	Waste generated at Site 2 was determined not to be hazardous. Accumulation of wastes onsite for longer than 90 days would not be subject to the substantive RCRA requirements for storage facilities.
Recordkeeping	Generator must keep records.	Generate hazardous waste.	40 CFR 262.4	Not applicable	Administrative requirements are not ARARs for onsite CERCLA actions.
Excavation	Movement of excavated materials to new location and placement in or on land will trigger land disposal restrictions for the excavated waste or closure requirements for the unit in which the waste is being placed.	Material containing RCRA hazardous wastes subject to land disposal restrictions are placed in another unit.	40 CFR 268.40	Not applicable	Excavated wastes determined not to be hazardous.
Placement of waste in land disposal unit	Attain land disposal treatment standards before putting waste into landfill in order to comply with land disposal restrictions.	Placement of RCRA hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, or underground mine or cave.	40 CFR 268.40	Not applicable	Excavated wastes determined not to be hazardous.
Clean Water Act (CWA), 33 USC 1251 et seq.*					
Discharge to POTW	Pretreatment standards. Control the introduction of pollutants into POTWs so as to: prevent interference with the operation of a POTW; prevent pass through of pollutants through a treatment works; and improve opportunities to recycle and reclaim municipal and industrial wastewater and sludges.	Discharge to a POTW.	40 CFR 403	Not applicable	TBC for unpermitted section of landfill. However, entire landfill will be closed in accordance Virginia solid waste landfill regulations.

Table A-2a
Potential Federal Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAR Determination*	Comments
Discharge of treatment system effluent	Water quality standards.	Point source discharge to waters of the United States.	40 CFR 122.44(a)	Relevant and appropriate	Discharge of treatment system effluent is not planned as part of the response action at Site 2. Regulation is relevant and appropriate to potential discharge to the drainageway (from dewatering during the sediment excavation).
	Best Management Practices. Develop and implement a Best Management Practice program to prevent the release of toxic constituents to surface waters.				
	Best available technology. Use of Best Available Technology (BAT) economically achievable is required to control toxic and nonconventional pollutants. Use of best conventional pollutant control technology (BCT) is required to control conventional pollutants.		40 CFR 125.100		
	Monitoring Requirements: Discharge must be monitored to assure compliance. Comply with additional substantive requirements such as: mitigate any adverse effects of any discharge, and proper operation and maintenance of treatment systems.		40 CFR 122.41(i), (j)		

Table A-2a
Potential Federal Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAR Determination*	Comments
Criteria for Classification of Solid Waste Disposal Facilities and Practices, 40 CFR Part 257*					
Solid waste dispos al	A facility or practice shall not contaminate an underground drinking water source beyond the solid waste boundary or a court-or State-established alternative.	Solid waste disposal facility and practices except agricultural wastes, overburden resulting f rom mining operations, land application of domestic sewage, location and operations of septic tanks, solid or dissolved materials in irrigation return flows, industrial discharges that are point sources subject to permits under CWA, source special nuclear or by-product material as defined by the Atomic Energy Act, hazardous waste disposal facilities that are subject to regulation under RCRA Subtitle C, disposal of solid waste by underground injection, and municipal solid waste landfill units.	40 CFR 257.3-4 and Appendix I	Not applicable	Groundwater in the area of remediation is not a drinking water source.
	A facility shall not cause a discharge of pollutants into waters of the U.S. that is in violation of the substantive requirements of the NPDES under CWA Section 402, as amended.		40 CFR 257.3-3(a)	Not applicable	No discharge to the drainage channel is planned as part of the response action.
	A facility shall not cause discharge of dredged material or fill material to waters of the U.S. that is in violation of the substantive requirements of CWA Section 404.		40 CFR 257-3.3	Not applicable	The response action at Site 2 will not include the disposal of dredge or fill material into waters of the U.S.

Table A-2a
Potential Federal Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAR Determination*	Comments
Solid waste disposal (continued)	A facility or practice shall not cause nonpoint source pollution of waters of the U.S. that violates applicable legal substantive requirements implementing an area wide or Statewide water quality management plan approved by the Administrator under CWA Section 208, as amended.	Solid waste disposal facility and practices except agricultural wastes, overburden resulting from mining operations, land application of domestic sewage, location and operations of septic tanks, solid or dissolved materials in irrigation return flows, industrial discharges that are point sources subject to permits under CWA, source special nuclear or by-product material as defined by the Atomic Energy Act, hazardous waste disposal facilities that are subject to regulation under RCRA Subtitle C, disposal of solid waste by underground injection, and municipal solid waste landfill units.	40 CFR 257-3.3(c)	Applicable	The response action may include the disposal of wastes in a solid waste disposal facility. Substantive requirements would be applicable to an onsite disposal facility for nonhazardous wastes.
	The facility or practice shall not engage in open burning of residential, commercial, institutional, or industrial solid waste.	No open burning is planned as part burning of agricultural wastes in the field, silvicultural wastes for forest management purposes, land clearing debris from emergency cleanup operations, and ordnance.	40 CFR 257.3-7(a)	Not applicable	No open burning is planned as part of the response action at site 2.
	The facility shall not violate applicable requirements developed under a SIP approved or promulgated by the Administrator pursuant to CAA Section 110, as amended.		40 CFR 257.3-7(B)	Not applicable	No solid waste management units that would impact the SIP are planned.

*Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that DON accepts the entire statues or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs.

ACLs – Alternate concentration limits.

APEN – Air Pollution Emission Notice

ARAR - Applicable or relevant and appropriate requirement.

BACT – Best available control technology.

BDAT – Best demonstrated control technology.

CAA – Clean Air Act.

CAMU – Correction action management unit.

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act.

CFR - Code of Federal Regulations

CWA – Clean Water Act

DOT – Department of Transportation.

EPA – Environmental Protection Agency

LAER – Lowest achievable emission rate.

MCL – Maximum contaminant level.

MCLG – Maximum contaminant level goal.

NAAOS – National ambient air quality standards (primary and secondary).

NCP – National Contingency Plan.

NESHAP – National emission standards for hazardous air pollutant.

NPDES- National pollutant discharge elimination system.

OSHA – Occupational Safety and Health Administration.

PCB – Polychlorinated biphenyls.

POTW - Publicly owned treatment work.

ppm – parts per million.

ppmw – parts per million by weight.

RACT – Reasonably available control technology.

RCRA – Resource Conservation and Recovery Act.

SDWA – Safe Drinking Water Act.

SIP – State Implementation Plan.

SMCL – Secondary maximum contaminant level.

TBC – To be considered

TSCA – Toxic Substances Control Act.

UIC -– Underground injection control.

USC – United States Code.

UNDO – Underground source of drinking water.

VOC – Volatile organic compound.

Table A-2b
Potential Virginia Action-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment, and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAR Determination*	Comments
Air Pollution Control Board Statute, Ambient Air Quality Standards*					
Air emissions (particulate matter, sulfur oxides, carbon monoxide, ozone, nitrogen dioxide, and lead)	Establishes the primary and secondary air quality standards for particulate matter, sulfur oxides, carbon monoxide, ozone, nitrogen dioxide, and lead.	Operations generating air emissions.	Va. Code Ann. 10.1-1300 to 1326; 9 VAC 30-10 et seq.	Not applicable	No air emissions are expected to occur as part of the response actions at Site 2 (i.e. particulate matter, lead). If these emissions occur, the substantive requirements of this regulation will be applicable
Standards of Performance for Visible Emissions and Fugitive Dust/Emissions (Rule 5-1)	The term "fugitive emissions" refers to unintended emissions that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. Mandates that reasonable precautions be taken to prevent particular matter from becoming airborne during: handling, transporting, storing, using, constructing, altering, or repairing any materials; demolition, construction modification, or operation of any stationary source or any other bridling, structure, facility, or installation. Examples of reasonable precautions (§120-05-0104) include dust suppression during demolition (water or chemical); dust suppression on roads, material stockpiles, or other surfaces; paving/ cleaning roads; equipment installation (e.g., vents, hoods, fans, fabric filters) to enclose and vent dusty materials; use of containment methods during sandblasting or similar operations; and covering of transportation/conveyance equipment. Testing is required and the standard to be met is that visible emissions cannot exceed 20 percent opacity, except for one 6-minute period in any 1 hour of not more than 30 percent opacity. Continuous monitoring systems and other monitoring devices shall be installed, calibrated, maintained, and operated in accordance with 120-05-04 and Appendix J.	Operations generating visible emissions and fugitive dust/ air emissions (described under the requirement).	9 VAC 5-50-60 to 120	Applicable	These regulations are applicable at Site 2 in connection with activities that remove/transport/ convey debris and/or excavated materials; disturb the soil or sediment during excavation; disturb soil or other exposed surfaces during construction of haul roads.
Standards of Performance for	Visible Emissions and Fugitive Dust/Emissions. Provisions of 9 VAC	Operations generating visible emissions and fugitive dust/ air emissions (described under	9 VAC 5-50-240	Applicable	See 9 VAC 5-50-60 to 120 above.

Table A-2b
Potential Virginia Action-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment, and SurfaceWater
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAB Determination*	Comments
Stationary Sources (Rule 5-4)	5-50-60 to 120 (above) apply.	the requirement).			
Virginia Air Pollution Control Regulations, Chapter 60*					
Air emissions (hazardous air pollutants)	Incorporates EPA's standards for Hazardous Air Pollutants under §112 of the CAA, as amended in 1990 (40 CFR 61). Section 112 requires EPA to identify source categories for 189 toxic pollutants listed in the statute and to set Maximum Available Control Technology (MACT) limits for each category. EPA has published a list of 174 source categories of major and area sources that will be regulated. Lists of the 189 HAPs and the deadlines for issuing regulations for the 174 categories are attached. National Emission Standards for Hazardous Air Pollutants (NESHAPs) pertain to both existing and new/major modification sources. In addition to requiring MACT, the Federal and State regulations requiring testing, specify the test methods, and set monitoring requirements.	Operations generating air emissions.	9 VAC 5-60-60 to 110	Not applicable	See below for specific Rules that may apply to response actions at Site 2.
Environmental Protection Agency National Emission Standards for Hazardous Air Pollutants (Rule 6-1)	Incorporates EPA's NESHAPs (40 CFR 61), requiring the use of MALT for regulated pollutants from regulated source categories. EPA has identified sources categories within the waste treatment industry group for HAP regulation including: POTWs, municipal landfills, hazardous waste incineration, sewage sludge incineration, site remediation, solid waste treatment, storage and disposal facilities. The rule for POTWs is scheduled for final promulgation in March 1997. The others will not be final until at least the year 2000.	Operations generating air emissions.	9 VAC 5-60-60 to 110	To be considered	HAPs for the waste treatment industry are likely tobe applicable to disposal of soil, treatment, storage, and disposal facilities. If they are proposed, they will be TBCs.

Table A-2b
Potential Virginia Action-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment, and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAR Determination'	Comments
Environmental Protection Agency National Emission Standards for Hazardous Air Pollutants for Source Categories (Rule 6-2)	This regulation incorporates by reference most of the federal NESHAPs promulgated under 40 CFR Part 63 requiring the use of MACT standards for various source categories. [Note: See the Virginia regulations at 9 VAC 5-60-100 for a listing of those 40 CFR Part 63 provisions incorporated by reference.]		9 VAC 5-60-60 to 110	Not applicable	This regulation is a potential ARAR for remedial actions which may involve the release of hazardous air emissions from equipment leaks (e.g. pumps, compressors, pressure relief devices, valves).
Solid Waste Management Regulation, Virginia Waste Management Act					
Solid Waste Management (nonhazardous waste)	Establishes standards and procedures pertaining to siting, design, construction, operation, maintenance, closure, and post-closure care of solid waste management facilities.	Solid waste management activities	Va. Code Ann 10.1-1400 et seq.; 9 VAC 20-80-10 to 790	Relevant and Appropriate	The substantive requirements of this regulation may be relevant and appropriate for the response actions at the NBN Site 2, if the excavated soil is nonhazardous. The regulation is relevant and appropriate since Site 2 stopped managing wastes prior to December 21, 1988.
Handling of special solid wastes	Contains regulations for the disposal of special wastes. Special wastes are wastes that require special handling and precautions. Regulations require that facilities may receive special wastes for processing or disposal only with the specific prior approval of the VDEQ or by specific provisions with the facility permit.	Handling of special solid wastes.			The requirements of this regulation may be relevant and appropriate for wastes generated as a result of removal actions at NBN Site 2, including IDW, if the wastes are considered nonhazardous and are special wastes. The regulation is relevant and appropriate since Site 2 stopped managing wastes prior to December 21, 1988.
Hazardous Waste Regulation, Virginia Waste Management Act *					
Management of hazardous wastes	Provides for the control of all hazardous wastes that are generated within, or transported to the Commonwealth for the purposes of storage, treatment, or disposal or for the purposes of resource conservation or recovery, including requirements for manifest regulations, notification of hazardous waste management activity, transportation of hazardous waste and land disposal. Wastes are defined as hazardous either because they exhibit a hazardous characteristic (i.e.. ignitability, corrosivity, reactivity, or toxicity) or because the waste is "listed" as hazardous.	Transport, generation, handling, and storage of hazardous wastes generated within, or transported to the Commonwealth of Virginia.	Va. Code Ann 10.1-1400 et seq.; 9 VAC 20-60-10 to 420; 9 VAC 20-60-740 to 950; and 9 VAC 20-60-1430-1480	Not applicable	The substantive requirements of this regulation may be applicable for the response actions at Site 2, if the wastes (excavated soil, sediment, or IDW) exhibit hazardous waste characteristics. However, waste has been determined to be nonhazardous.

Table A-2b
Potential Virginia Action-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment, and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAR Determination*	Comments
Virginia Regulations Governing the Transportation of Hazardous Materials, Virginia Waste Management Act *					
Transportation of hazardous materials	Regulates the transportation of hazardous materials in Virginia. Every person who transports or offers for transportation hazardous materials within or through the Commonwealth of Virginia shall comply with the federal regulations governing the transportation of hazardous materials promulgated by the United States Secretary of Transportation with amendments promulgated and in effect as of March 18, 1994 (except as otherwise specified in this section) pursuant to the Hazardous Materials Transportation Act, and located at Title 49 of the Code of Federal Regulations as set forth in this section.	Transportation of hazardous materials in Virginia.	Va. Code Ann 10.1-1400 et seq.; 9 VAC 20-110-10 to 130	Applicable or Relevant and Appropriate	All offsite transport (off NBN proper) of hazardous materials generated as a result of removal/remedial actions, including IDW, at NBN must comply with the substantive and administrative requirements of this section. In addition, the substantive regulations in this section may be relevant and appropriate for onsite (on NBN) transport of hazardous materials.
Transportation of Hazardous Materials through Bridge-Tunnel Facilities*					
Transportation of hazardous materials	Establishes the rules by which all interstate, intrastate, and public and private transporters of hazardous materials are governed while traveling through state-owned bridge-tunnel facilities in the Commonwealth of Virginia.	Transportation of hazardous materials through bridge-tunnel facilities.	24 VAC 30-61-10 et seq.	Not applicable	The substantive requirements of this regulation may be applicable for the disposal of excavated soil or sediment at NBN Site 2, if the excavated waste or IDW is hazardous. However, waste has been determined to be nonhazardous.
Virginia Water Protection Permit Regulations, State Water Control Law*					
Dredging and filling activities	Delineates the procedures and requirements associated with dredging and filling activities that cause a discharge of any pollutants into, or adjacent to surface waters, or which impact the physical, chemical, or biological properties of surface waters.	Activities that require a Part 404 permit from the Corps of Engineers.	Va. Code Ann. 62.1-44.2, et seq.; 9 VAC 25-210-10 et seq.	Applicable	The regulations are applicable for dredge and/or fill activities (and any other activitie's which require a Part 404 permit from the Corps of Engineers) that cause a discharge of pollutants into, or adjacent to, surface waters, or which change the physical, chemical, or biological properties of the surface waters. At Site 2, such activities may include excavation of soil.

Table A-2b
Potential Virginia Action-Specific ARARs
NM Slag Pile - Site 2 Soil, Groundwater, Sediment, and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAR Determination*	Comments
Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulations*					
Discharge of Treated Water to Surface Waters, and certain storm water discharges	Restores and maintains the quality of surface waters. Controls the direct discharge of pollutants to surface waters through the Virginia Pollutant Discharge Elimination System (VPDES) program. Direct discharges of wastewater to surface waters must meet the effluent discharge limits established by this section. These limits are established on a case-by-case basis.	Discharge of all pollutants into state waters.	Va. Code Ann. 62.1-44.2, et seq.; 9 VAC 25-31-10 to 120; 9 VAC 25-31-180; 9 VAC 25-31-190 to 240; 9 VAC 25-31-900 and 910	Not applicable	At Site 2, these regulations are potentially applicable for Superfund actions that involve direct discharges to surface waters (i.e., decontamination water, or other wastewater to be discharged directly to surrounding surface waters).
Virginia Pollutant Abatement (VPA) Permit Regulation*					
Discharge adjacent to state waters, pollution management	Except in compliance with a VPA permit, or another permit, issued by the board, cannot discharge noxious or deleterious substances into state waters, or alter the physical, chemical, or biological properties of such state waters. A VPA permit authorizes pollutant management activities including, but not limited to, animal feeding operations, storage or land application of sewage, sludge, industrial waste or other waste.	Discharge of noxious or deleterious substances into state waters, storage or land application of wastes.	Va. Code Ann. 62.1-44.2, et seq.; 9 VAC 32-10 et seq.	Not applicable	The substantive portions of this regulation is a potential ARAR for all remediation activities that involve non-point source discharges to surfac., waters from pollutant management activities as defined in this section (i.e. sediment drying activities at the site). The VPA permitting and administrative requirements are not potential ARARs for on-site activities.

Table A-2b
Potential Virginia Action-Specific ARARs
NM Slag Pile - Site 2 Soil, Groundwater, Sediment, and Surface Water
Naval Base, Norfolk, Virginia

Action	Requirement	Prerequisites	Citation	ARAR Determination*	Comments
Stormwater Management Regulations, Virginia Stormwater Management Act*					
Actions affecting stormwater runoff (activities that disturb the land)	Inhibits deterioration of existing waters and waterways by requiring that post development stormwater runoff characteristics, including water quality and quantity, are maintained, to the extent practicable, equal to or better than pre-development runoff characteristics. Establishes minimum acceptable criteria to control non-point pollution, localized flooding, and stream channel erosion. Requires that all land development projects have a stormwater management plan that specifies how stormwater will be controlled such that the post-development runoff rate will not exceed the pre-development runoff rate. Also contains specific methods for calculating runoff rates, standards for water volume control facilities (e.g., detention basins, infiltration facilities), and requires compliance with the Virginia Erosion and Sediment Control Regulations (see below).	Potential for an alteration in the stormwater runoff patterns. Does not apply to land development projects that disturb less than one acre of land area, except that the governing body of a locality that has adopted a local stormwater management program may exempt a smaller area of disturbed land or may qualify the conditions under which this exemption shall apply.	Va. Code Ann. 10.1-603.1-603.15; VR 215-02-00; VR 625-02-00; 4 VAC 50-30-10	Applicable	This regulation is applicable for "land development projects" (a manmade change to the land surface that potentially changes its runoff characteristics, i.e.. excavation of soils) undertaken as part of a removal or remedial action, and would require that such projects develop an erosion and sediment control plan. Specifically applicable to pumping of surface water out of the drainageway to dry the excavated sediment.
Erosion and Sediment Control Law and Erosion and Sediment Control Regulations *					
Actions resulting in sediment erosion, sediment deposition, and runoff (activities that disturb the land)	Establishes minimum standards for the control of sediment erosion, sediment deposition, and runoff, and requires that an erosion and sediment control plan be prepared and submitted for activities that disturb the land. Specific requirements include: minimum standards for sediment basins and traps; sediment stabilization procedures; protection of waterways and properties from erosion, sediment deposition, and damage due to increased volume, velocity or peak flow rate of stormwater runoff.	Potential for sediment erosion, sediment deposition, or runoff. Does not apply to development projects that disturb less than one acre of land area, except that the governing body of a locality that has adopted a local stormwater management program may exempt a smaller area of disturbed land or may qualify the conditions under which this exemption shall apply.	Code of Virginia 10.1-560 et seq; 4 VAC 50-30-10 to 110	Applicable	This regulation is applicable for "land development projects" (a manmade change to the land surface that potentially changes its runoff characteristics, i.e.. excavation of soils) undertaken as part of a removal or remedial action, and would require that such projects develop an erosion and sediment control plan. Specifically applicable to pumping of surface water out of the drainageway to dry the excavated sediment.

*Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that DON accepts the entire statues or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs.

ARAR - Applicable or relevant and appropriate requirement.
BACT - Best Available Control Technology.
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act.
CFR - Code of Federal Regulations
IDW - Investigation-derived waste.
LAER - Lowest Achievable Emission Rate.
NESHAP - National Emission Standards for Hazardous Air Pollutants.
TCLP - Toxicity Characteristic Leachate Procedure.
USC - United States Code.
VAC - Virginia Administrative Code.
VDEQ - Virginia Department of Environmental Quality.
VPA - Virginia Pollution Abatement.
VPDES - Virginia Pollution Discharge Elimination System.

Table A-1b
Potential Virginia Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
Endangered Species Act*					
Habitat upon which endangered species or threatened species depend	The taking, transportation, processing, sale, or offer for sale within the Commonwealth of any threatened or endangered species published by the United States Secretary of the Interior is prohibited, except as provided in Part 29.1-568. Species are listed both by the Department of the Interior and by the Department of Game and Inland Fisheries.	Determination of effect upon endangered or threatened species or its habitat.	Code of Virginia Sections 29.1-563 through 568; 4 VAC 15-20-130 to 140	Not applicable	There are no endangered or threatened animal species at Site 2.
Virginia Endangered Plant and Insect Species Act*					
Habitat upon which endangered or threatened species depend	The agency may make regulations to declare species to be threatened or endangered and may establish programs for their preservation and to prohibit the taking of endangered species as they are defined in this regulation.	Determination of effect upon endangered or threatened species or its habitat.	Code of Virginia 3.1-1020 et seq; 2 VAC 5-320-10	Not applicable	There are no endangered or threatened plant or animal species at Site 2,
Virginia Historic Resource Law, Virginia Antiquities Act*					
Area of historic properties, antiquities on state-controlled lands	Relates to the nomination of sites to the National Register by the Commonwealth. Prohibits the taking of antiquities on state-controlled lands.	Adverse affect on historical properties, antiquities on state-controlled lands	Code of Virginia 10.1-2200 et seq; 10.1-2300 et seq.	Not applicable	There are no historic properties on Site 2.

Table A-1b
Potential Virginia Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
Hazardous Waste Facility Siting Criteria*					
Environmentally sensitive locations (locations where the placement of a hazardous waste facility increases the risk to health and the environment).	Hazardous waste treatment, storage and disposal facilities should not be placed in certain specific locations of the state, for example: in wetlands, 100-year floodplain, or such larger area which the flood of record may have inundated, areas prone to flooding due to dam failure, underground (injection), over a sinkhole or less than 100 feet above a solution cavern beneath the facility associated with karst topography, areas designated by the National Park Service in the Registry of Natural Landmarks or sites listed on the National Register of Historic Places, and the Virginia Landmarks Register (unless exceptions provided in the statute), state, county and municipal parks, units of the National Park System, national recreation areas, state forests, state game lands, national wildlife refuges or national fish hatcheries (unless exceptions have been provided in the statute)..	Placement of hazardous waste treatment, storage, and disposal facilities.	9 VAC 20-50-70	To be considered	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. The small wetland area adjacent to the site will not be disturbed.

Table A-1b
Potential Virginia Location-Specific ARARs
NM Slag Pile — Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
Environmentally sensitive locations (locations where the placement of a hazardous waste facility increases the risk to health and the environment).	The water resources of the state (surface water and groundwater) should be afforded the maximum protection reasonably possible. Siting of a facility must take into account air quality problems which may result from the operation of the facility or accidental fires and explosions which may occur. A hazardous waste facility shall not be sited in locations where the siting, construction and operation of the proposed facility would occupy or threaten the known habitat or an endangered or threatened plant, insect, fish or wildlife species to the extent that the contin ued existence of the species is threatened, in proximity to publicly designated areas, active faults, or in subsurface mining areas. Consideration should be given to the effect of the slope of the proposed site and adjacent lands with respect to waste management facilities. Must evaluate the risk associated with the transportation of hazardous waste to the proposed site. The linear distance from the facility boundary to major structures must be considered (e.g., residence, airport, school, hospital, church, commercial centers, nursing home). The facility shall be considered for consistency with the local master land use plan or the pattern of already existing land uses or zoning ordinance of the host community where no comprehensive plan has been adopted.	Placement of hazardous waste treatment, storage, and disposal facilities.	9 VAC 20-50-80	Applicable	The requirements of this regulation will be incorporated for response actions at Site 2 (i.e. for surface water protection, and fish and wildlife protection of the Site 2 drainageway).

Table A-1 b
Potential Virginia Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
State Water Control Law, Virginia Water Protection Permit Regulation, Virginia Pollution Discharge Elimination System Permit Regulation,Virginia Pollution Abatement *					
Surface waters and the adjacent land	No person shall dredge, fill or discharge any pollutant into, or adjacent to surface waters, or otherwise alter the physical, chemical, or biological properties of surface waters, except as authorized pursuant to a Virginia Water Protection Permit, a Virginia Pollution-Discharge System Elimination System Permit, or a Virginia Pollution Abatement Permit.	Dredging, filling, or discharging of pollutants.	Virginia Code Ann. 62.1-44.2 to 44.4; 9 VAC 25-210-10; 9 VAC 25-31-10 to 940; 9 VAC 25-32-10 to 300	Applicable	Remedial activities occurring at Site 2 will incorporate the requirements of this regulation.
Special Designations in Surface Waters*					
Scenic Rivers	Must provide for identification, preservation, and protection of certain rivers which possess natural beauty of high quality to assure their use and enjoyment for their scenic, recreational, geologic, fish and wildlife, historic, cultural or other values.	Activities affecting the quality of scenic rivers.	9 VAC 25-260-320	Not applicable	There are no scenic rivers on Site 2.
Wetlands Policy*					
Wetlands	Must minimize alteration in the quantity or quality of the natural flow of water that nourishes wetlands and to protect wetlands from adverse dredging or filling practices, solid was te management practices, siltation, or the addition of pesticides, salts, or toxic materials arising from non-point source wastes and through construction activities, and to prevent violation of applicable water quality standards from such environmental insults.	Activities affection the stability of wetlands.	9 VAC 25-380-10 et seq.	To be considered	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. The small wetland area adjacent to the site will not be disturbed.

Table A-1b
Potential Virginia Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
General Provisions Relating to Marine Resources Commission, Wetlands Mitigation Compensation Policy*					
Wetlands	Requires that any activity that impacts a wetland meet the provisions of the Virginia Wetlands Act and regulations. Wetlands of primary ecological s ignificance must not be altered so that ecological systems in the wetlands are unreasonably disturbed. Apply to both vegetated (lands lying between and contiguous to mean low water and an elevation above mean low water equal to the factor one and one-half times the mean tide range and upon which is growing a species of vegetation) and nonvegetated wetlands (unvegetated lands lying contiguous to mean low water and between mean low water and mean high water).	Activities impacting either a vegetated or nonvegetated wetland.	4 VAC 20-390-10 to 50	Applicable	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. The small wetland area adjacent to the site will not be disturbed.
Water Resources Policy*					
Wetlands	Requires protec tion of wetlands (spoils produced from original dredging and channel maintenance projects should not be disposed of in any manner that would in itself adversely modify circulation in wetlands, both tidal and nontidal). The long-term protection of the environment shall be the guiding criterion in decisions relating to water and related land resources. In the flood plain, construction of facilities designed to store substances which might be hazardous to the stream environment is discouraged.	Activities affecting the stability of wetlands, water or land resources, construction in floodplain zones.	9 VAC 25-390-10 et seq.	To be considered	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. The small wetland area adjacent to the site will not be disturbed.

Table A-1 b
Potential Virginia Location-Specific ARARs
NM Slag Pile – Site 2 Soil, Groundwater, Sediment and Surface Water
Naval Base, Norfolk, Virginia

Location	Requirement	Prerequisite	Citation	ARAR Determination	Comments
Virginia State Water ControlLaws and Virginia Wetlands Regulations*					
Wetland	Action to minimize the destruction, loss, or degradation of wetlands.	Wetland as defined by Virginia statutory provision.	Virginia Code Sections 62.1-44.15:5	Not applicable	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. The small wetland area adjacent to the site will not be disturbed.
Chesapeake Bay Preservation Act and Chesapeake Bay Preservation Area Designation and Management Regulations (CBPA Regulations)*					
Chesapeake Bay areas	Under these requirements, certain locally designated tidal and nontidal wetlands, as well as other sensitive land areas, may be subject to limitations regarding land-disturbing activities, removal of vegetation, use of impervious cover, erosion and sediment control, stormwater management, and other aspects of land use that may have effects on water quality. Developments exceeding 2,500 square feet must comply with the requirements of any local erosion and sediment control ordinances.	Federally owned area designated as a Chesapeake Bay Preservation area.	9 VAC 10-20-10 to 280	Applicable	The Site 2 drainageway is a man-made, upland ditch and is not considered to be a wetland. The small wetland area adjacent to the site will not be disturbed.

*Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that Navy accepts the entire statues or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs.

ARARs - Applicable or relevant and appropriate requirements.
EPA - Environmental Protection Agency.
VAC - Virginia Administrative Code.

Appendix B

Final Remedial Investigation Results

TABLE 3

MONITORING WELL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED RBC SCREENING LEVELS, MCLs,
OR VIRGINIA GROUNDWATER STANDARDS
NBN SITE 2, SEPTEMBER 1996

ORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (ug/L) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/L)	DV QUAL [4]	DETECTION LIMIT (ug/L) [5]	EXCEEDENCE QUOTIENT [6]
Trichloroethene	1.6	RBC Tap	1/2	NBS2-MW01	2.1		1	1.31

INORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (ug/L) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/L)	DV QUAL [4]	DETECTION LIMIT (ug/L) [5]	EXCEEDENCE QUOTIENT [6]
Arsenic	0 045	RBC Tap	2/4	NBS2-MW02	11.9		9	264.44
				NBS2-MW01	14.4		9	320.00
Cadmium	0.4	VAGS	1/4	NBS2-MW01	2.9	J	1	7.25
Iron	300	VAGS	4/4	NBS2-MW02F	937		27	3.12
				NBS2-MW02	5720		27	19.07
				NBS2-MW01F	11300		27	37.67
				NBS2-MW01	15700		27	52.33
Manganese	50	VAGS	4/4	NBS2-MW02F	452		1	9.04
				NBS2-MW01	527		1	10.54
				NBS2-MW02	533		1	10.66
				NBS2-MW01F	590		1	11.80
Selenium	10	VAGS	2/4	NBS2-MW01	19.6		5	1.96
				NBS2-MW01F	26.5		5	2.65
Thallium	2	MCL	4/4	NBS2-MW01	9	L	9	4.50
				NBS2-MW01F	9	L	9	4,50
				NBS2-MW02	9	L	9	4.50
				NBS2-MW02F	9	L	9	4.50

TABLE 3-1

MONITORING WELL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED RBC SCREENING LEVELS, MCLs,
OR VIRGINIA GROUNDWATER STANDARDS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (ug/L) [1]		FREQUENCY OF EXCEEDENCE[2]	LOCATION OF EXCEEDENCE[3]	ANALYTICAL RESULT (ug/L)	DV QUAL[4]	DETECTION LIMIT (ug/L) [5]	EXCEEDENCE QUOTIENT [6]
Zinc	50	VAGS	2/4	NBS2-MW01F	70.2		2	1.40
				NBS2-MW01	97	K	2	1.94

Footnotes:
1 - The most conservative screening level was used to determine exceedences. "RBC Tap" indicates that the RBC Tap Water screening level was used, "VAGS" Indicates that the Virginia Groundwater Standard was used, and "MCL" indicates that the Maximum Contaminant Level was used.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed identification.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-2

IN-SITU GROUNDWATER SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED RBC SCREENING LEVELS, MCLs,
OR VIRGINIA GROUNDWATER STANDARDS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (ug/L) [1]		FREQUENCY OF EXCEEDENCE[2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/L)	DV QUAL [4]	DETECTION LIMIT (ug/L) [5]	EXCEEDENCE QUOTIENT [6]
Aluminum	37000	RBC Tap	4/14	GW-05-9	52400		6	1.42
				GW-01-9	61900		6	1.67
				GW-04-9	236000		6	6.38
				GW-06-9	346000		6	9.35
Antimony	6	MCL	3/14	GW-01-9	8	J	4	1.33
				GW-02-9	8.3	J	4	1.38
				GW-04-9	11.8	J	4	1.97
Arsenic	0.045	RBC Tap	13/14	GW-02-9D	6.8	J	4	151.11
				GW-06-9F	8.1	J	4	180.00
				GW-02-9DF	8.7	J	4	193.33
				GW-04-9F	13.3		4	2.95.56
				GW-02-9	14.1	J	4	313.33
				GW-03-9	14.4	J	4	320.00
				GW-03-9F	18.9		4	420.00
				GW-01-9F	19		4	422.22
				GW-05-9F	29.9		4	664.44
				GW-01-9	44.4	J	4	986.67
				GW-05-9	47.5	J	4	1055.56
				GW-06-9	86	J	4	1911.11
				GW-04-9	225	J	4	5000.00
Beryllium	0.016	RBC Tap	4/14	GW-01-9	2.6	J	1	162.50
				GW-05-9	4.2	J	1	262.50
				GW-04-9	8.5		1	531.25
				GW-06-9	9.4		1	587.50
Cadmium	0.4	VAGS	1/14	GW-02-9	1.2	J	1	3.00
Chromium	50	VAGS	4/14	GW-05-9	116		2	2.32
				GW-01-9	128		2	2.56
				GW-04-9	527			10.54

TABLE 3-2

IN-SITU GROUNDWATER SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED RBC SCREENING LEVELS, MCLs,
OR VIRGINIA GROUNDWATER STANDARDS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (ug/L) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/L)	DV QUAL [4]	DETECTION LIMIT (ug/L) [5]	EXCEEDENCE QUOTIENT [6]
Chromium	50	VAGS	4/14	GW-06-9	675		2	13.50
Iron	300	VAGS	14/14	GW-06-9F	4690		18	15.63
				GW-04-9F	8860		18	29.53
				GW-02-9F	10200		18	34.00
				GW-02-9DF	10700		18	35.67
				GW-02-9D	11600		18	38.67
				GW-02-9	18100		18	60.33
				GW-03-9F	20800		18	69.33
				GW-03-9	21600		18	72.00
				GW-01-9F	31500		18	105.00
				GW-05-9F	63700		18	212.33
				GW-01-9	95000		18	316.67
				GW-06-9	99700		18	332.33
				GW-05-9	116000		18	386.67
				GW-04-9	248000		18	826.67
Lead	15	MCL	7/14	GW-03-9	16.1		2	1.07
				GW-05-9	69.3		2	4.62
				GW-02-9D	106		2	7.07
				GW-06-9	224		2	14.93
				GW-02-9	241		2	16.07
				GW-01-9	284		2	18.93
				GW-04-9	357		2	23.80
Manganese	50	VAGS	14/14	GW-06-9F	79.9		1	1.60
				GW-04-9F	135		1	2.70
				GW-05-9F	232		1	4.64
				GW-03-9	273		1	5.46
				GW-03-9F	296		1	5.92
				GW-05-9	377		1	7.54

TABLE 3-2

IN-SITU GROUNDWATER SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED RBC SCREENING LEVELS, MCLs,
OR VIRGINIA GROUNWATER STANDARDS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (ug/L) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/L)	DV QUAL [4]	DETECTION LIMIT (ug/L) [5]	EXCEEDENCE QUOTIENT [6]
Manganese	50	VAGS	14/14	**GW-01-9F**	**381**		**1**	**7.62**
				GW-02-9DF	**812**		**1**	**16.24**
				GW-02-9	**861**		**1**	**17.22**
Nickel	100	MCL	1/14	**GW-06-9**	**105**		**3**	**1.05**
Selenium	10	VAGS	2/14	**GW-06-9**	**15.8**		**5**	**1.58**
				GW-02-9F	**18.5**		**5**	**1.85**
Thallium	2	MCL	1/14	**GW-04-9**	**9.9**	**J**	**5**	**4.95**
Vanadium	260	RBC Tap	2/14	**GW-06-9**	**689**		**1**	**2.65**
				GW-04-9	**1070**		**1**	**4.12**
Zinc	50	VAGS	5/14	**GW-01-9**	**102**		**2**	**2.04**
				GW-05-9	**107**		**2**	**2.14**
				GW-02-9	**211**		**2**	**4.22**
				GW-06-9	**227**		**2**	**4.54**
				GW-04-9	**271**		**2**	**5.42**

Footnotes:
1 - The most conservative screening level was used to determine exceedences. "RBC" indicates that the RBC Tap Water screening level was used, "VAGS" indicates that the Virginia groundwater standard was used, and "MCL" Indicates that the Maximum Contaminant level was used.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-3

MONITORING WELL SAMPLING RESULTS
SUMMARY OF DETECTED CHIMICALS THAT EXCEED RBS SCREENING LEVELS, MCLs,
OR VIRGINIA GROUNDWATER STANDARDS
NBS SITE, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (ug/L) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/L)	DV QUAL [4]	DETECTION LIMIT (ug/L) [5]	EXCEEDENCE QUOTIENT [6]
Arsenic	0.045	RBC Tap	10/14	**MW05F**	**5.2**	**J**	**4**	**115.56**
				MW04F	**9.8**	**J**	**4**	**217.78**
				MW06F	**10**		**4**	**222.22**
				MW06	**11**		**4**	**244.44**
				MW04FP	**11.3**		**4**	**251.11**
				MW04	**16.5**		**4**	**366.67**
				MW04P	**16.9**		**4**	**375.56**
				MW01	**17.2**		**4**	**382.22**
				MW05	**20.2**		**4**	**448.89**
				MW06F	**22.3**		**4**	**495.56**
Beryllium	0.016	RBC Tap	2/14	**MW03**	**1.3**	**J**	**1**	**81.25**
				MW03F	**1.3**	**J**	**1**	**81.25**
Iron	300	VAGS	11/14	**MW03F**	**2140**		**18**	**7.13**
				MW01F	**2360**		**18**	**7.87**
				MW02F	**8400**		**18**	**28.00**
				MW06F	**9620**		**18**	**32.07**
				MW01	**10700**		**18**	**35.67**
				MW05	**13500**		**18**	**45.00**
				MW06	**14800**		**18**	**49.33**
				MW04FP	**15300**		**18**	**51.00**
				MW04F	**16800**		**18**	**56.00**
				MW04	**22700**		**18**	**75.67**
				MW04P	**2310**		**18**	**77.00**
Lead	15	MCL	1/14	**MW06**	**71.4**	**J**	**2**	**4.76**
Manganese	50	VAGS	10/14	**MW05F**	**64.7**		**1**	**1.29**
				MW04F	**138**		**1**	**2.76**
				MW04FP	**142**		**1**	**2.84**
				MW06F	**186**		**1**	**3.72**

TABLE 3-3

MONITORING WELL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED RBC SCREENING LEVELS, MCLs,
OR VIRGINIA GROUNDWATER STANDARDS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (ug/L) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/L)	DV QUAL [4]	DETECTION LIMIT (ug/L) [5]	EXCEEDENCE QUOTIENT [6]
Manganese	50	VAGS	10/14	**MW01F**	**210**		**1**	**4.20**
				MW05	**293**		**1**	**5.86**
				MW06F	**406**		**1**	**8.12**
				MW06	**523**		**1**	**10.46**
				MW02F	**583**		**1**	**11.66**
				MW01	**713**		**1**	**14.26**
Selenium	10	VAGS	1/14	**MW02F**	**11.5**		**5**	**1.15**
Thallium	2	MCL	2/14	**MW02F**	**6.3**	**J**	**5**	**3.15**
				MW06F	**7.9**	**J**	**5**	**3.95**

Footnotes:
1 - The most conservative screening level was used to determine exceedences. "RBC Tap" indicates that the RBC Tap Water screening level was used, "VAGS" indicates that the Virginia groundwater standard was used, and "MCL" Indicates that the Maximum Contaminant level was used.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-4

SURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED RBC INDUSTRIAL SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE SCREENING LEVEL OR REGULATORY STANDARD (mg/kg)		FREQUENCY OF EXCEEDENCE [1]	LOCATION OF EXCEEDENCE [2]	ANALYTICAL RESULT (mg/kg)	DV QUAL [3]	DETECTION LIMIT (mg/kg) [4]	EXCEEDENCE QUOTIENT [5]
Arsenic	3.8	RBC IND	3/4	**NBS2-SS02**	**14.4**		**1.8**	**3.79**
				NBS2-SS02P	**14.8**		**1.9**	**3.89**
				NBS2-SS03	**18.7**		**1.9**	**4.92**

Footnotes:
1 – Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
2 – An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
3 – Data Validation Qualifiers: "J" = Analyte present – reported value may not be accurate or precise. "K" = Analyte present – reported value may be biased high. "L" = Analyte present – reported value may be reported low. No code = Confirmed identification.
4 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.

TABLE

SURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

ORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL(ug/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/kg)	DV QUAL [4]	DETECTION LIMIT (ug/kg) [5]	EXCEEDENCE QUOTIENT [6]
Benzo[a]anthracene	100	BOTH	1/4	**NBS2-SB01**	**140**	J	180	1.40
Benzo[a]pyrene	100	FN	1/4	**NBS2-SB01**	**130**	J	180	1.30
Benzo[b]fluoranthene	100	BOTH	1/4	**NBS2-SB01**	**160**	J	180	1.60
Chrysene	100	BOTH	1/4	**NBS2-SB01**	**140**	J	180	1.40
Fluoranthene	100	BOTH	2/4	**NBS2-SB02P**	**140**	J	180	1.40
				NBS2-SB01	**250**	J	180	2.50
Phenanthrene	100	BOTH	1/4	**NBS2-SB02P**	**130**	J	180	1.30
Pyrene	100	BOTH	2/4	**NBS2-SB02P**	**120**	J	180	1.20
				NBS2-SB01	**200**	J	180	2.00

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Aluminum	1	FL	4/4	**NBS2-SS02P**	**3940**		2.3	3940.00
				NBS2-SS03	**4900**		2.3	4900.00
				NBS2-SS01	**5150**		2.4	5150.00
				NBS2-SS02	**5260**		2.2	5260.00
Beryllium	0.02	FL	4/4	**NBS2-SS01**	**0.28**	K	0.22	14.00
				NBS2-SS03	**0.47**	K	0.21	23.50
				NBS2-SS02	**0.49**	K	0.2	24.50
				NBS2-SS02P	**0.6**	K	0.21	30.00
Chromium	0.0075	FN	4/4	**NBS2-SS01**	**9.4**		0.22	1253.33
				NBS2-SS02P	**11**		0.21	1466.67
				NBS2-SS02	**14.2**		0.2	1893.33
				NBS2-SS03	**14.8**		0.21	1973.33

TABLE 3-5

SURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Copper	15	FL	4/4	**NBS2-SS01**	**18.7**		0.22	1.25
				NBS2-SS02P	**27.8**		0.21	1.85
				NBS2-SS02	**32.3**		0.2	2.15
				NBS2-SS03	**55.7**		0.21	3.71
Iron	12	FN	4/4	**NBS2-SS01**	**6610**		5.9	550.83
				NBS2-SS02P	**11200**		5.7	933.33
				NBS2-SS03	**11500**		5.6	958.33
				NBS2-SS02	**16800**		5.5	1400.00
Lead	0.01	FN	4/4	**NBS2-SS02P**	**54.2**		0.63	5420.00
				NBS2-SS02	**60.6**		0.61	6060.00
				NBS2-SS03	**82.8**		0.62	8280.00
				NBS2-SS01	**87.3**		0.65	8730.00
Nickel	2	FL	4/4	**NBS2-SS01**	**8**	K	0.65	4.00
				NBS2-SS02P	**9.8**		0.63	4.90
				NBS2-SS02	**10.2**		0.61	5.10
				NBS2-SS03	**10.4**	K	0.62	5.20
Vanadium	0.5	FL	4/4	**NBS2-SS02P**	**15.8**	K	0.21	31.60
				NBS2-SS02	**19.4**	K	0.2	38.80
				NBS2-SS03	**19.5**	K	0.21	39.00
				NBS2-SS01	**27**		0.22	54.00
Zinc	10	FL	4/4	**NBS2-SS01**	**56.9**		0.43	5.69
				NBS2-SS02P	**93.1**		0.42	9.31
				NBS2-SS02	**99.8**		0.41	9.98
				NBS2-SS03	**143**		0.41	14.30

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" indicates that the BTAG fauna screening level was used, "FL" indicates that the BTAG flora screening level was used, and "BOTH" Indicates that the BTAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.

TABLE

3 - An “F” at the end of a sample ID indicates that the sample was filtered during collection. A “P” or a “D” at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: “J” = Analyte present - reported value may not be accurate or precise. “K” = Analyte present - reported value may be biased high.
“L” Analyte present - reported value may be reported low. No code = Confirmed identification.
5 - For organic analyses Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-6

SURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg)[1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL[4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Aluminum	1	FL	1/1	SS-01	5460		1.4	5460.00
Antimony	0.48	FL	1/1	SS-01	1.3	J	0.94	2.71
Beryllium	0.02	FL	1/1	SS-01	0.25	J	0.24	12.50
Cadmium	2.5	FL	1/1	SS-01	2.6		0.24	1.04
Chromium	0.0075	FN	1/1	SS-01	24.8		0.47	3306.67
Copper	15	FL	1/1	SS-01	148		0.47	9.87
Iron	12	FN	1/1	SS-01	3450		4.2	287.50
Lead	0.01	FN	1/1	SS-01	164		0.47	16400.00
Nickel	2	FL	1/1	SS-01	13.2		0.71	6.60
Silver	0.0000098	FL	1/1	SS-01	1.2	J	0.47	122448.98
Vanadium	0.5	FL	1/1	SS-01	13.9		0.24	27.80
Zinc	10	FL	1/1	SS-01	202		0.47	20.20

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" Indicates that the BTAG fauna screening level was used, "FL" indicates that the BTAG flora screening level was used, and "BOTH" indicates that the BTAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" Analyte present - reported value may be reported low. No code = Confirmed identification.
5 - For organic analyses Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used. For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	RBC INDUSTRIAL SOIL SCREENING LEVEL (mg/Kg)		FREQUENCY OF EXCEEDENCE [1]	LOCATION OF EXCEEDENCE [2]	ANALYTICAL RESULT (mg/Kg)	DV QUAL [3]	DETECTION LIMIT (ug/Kg) [4]	EXCEEDENCE QUOTIENT [5]
Arsenic	3.8	RBC IND	4/9	SB05	5		2.4	1.32
				SB02	7		2.1	1.84
				SB09	7.1		2	1.87
				SB04	7.8		1.9	2.05
Beryllium	1.3	RBC IND	1/9	SB02	7.2		0.23	5.54

Footnotes:
1 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
2 - An “F” at the end of a sample ID indicates that the sample was filtered during collection. A “P” or a “D” at the end of a sample ID indicates a duplicate sample.
3 - Data Validation Qualifiers: “J” = Analyte present - reported value may not be accurate or precise. “K” = Analyte present - reported value may be biased high.
“L” = Analyte present - reported value may be reported low. No code =Confirmed Identification.
4 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit (CRDL) for EPA CLP SOW is used.
5 Exceedence Quotient = analytical result / screening level.

TABLE 3-8

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

ORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (ug/kg) [1]		FREQUENCY OF EXCEEDENCE[2]	LOCATION OF EXCEEDENCE[3]	ANALYTICAL RESULT (ug/kg)	DV QUAL[4]	DETECTION LIMIT (ug/kg) [5]	EXCEEDENCE QUOTIENT [6]
Benzo[a]anthracene	100	BOTH	4/9	NBS2-SB01	130	J	180	1.30
				NBS2-SB02	210	J	200	2.10
				NBS2-SB06	280	J	200	2.80
				NBS2-SB09	280	J	180	2.80
Benzo[a]pyrene	100	FN	4/9	NBS2-SB01	120	J	180	1.20
				NBS2-SB02	160	J	200	1.60
				NBS2-SB06	170	J	200	1.70
				NBS2-SB09	330	J	180	3.30
Benzo[b]fluoranthene	100	BOTH	5/9	NBS2-SB04	120	J	180	1.20
				NBS2-SB01	140	J	180	1.40
				NBS2-SB02	170	J	200	1.70
				NBS2-SB06	180	J	200	1.80
				NBS2-SB09	420	J	180	4.20
Benzo[k]fluoranthene	100	BOTH	4/9	NBS2-SB04	130	J	180	1.30
				NBS2-SB02	170	J	200	1.70
				NBS2-SB06	270	J	200	2.70
				NBS2-SB09	420	J	180	4.20
Chrysene	100	BOTH	5/9	NBS2-SB01	120	J	180	1.20
				NBS2-SB04	170	J	180	1.70
				NBS2-SB02	200	J	200	2.00
				NBS2-SB06	300	J	200	3.00
				NBS2-SB09	310	J	180	3.10
Fluoranthene	100	BOTH	6/9	NBS2-SB05	140	J	220	1.40
				NBS2-SB04	190	J	180	1.90
				NBS2-SB01	260	J	180	2.60
				NBS2-SB02	420		200	4.20
				NBS2-SB09	440		180	4.40
				NBS2-SB06	640		200	6.40

TABLE 3-8

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

ORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (ug/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/kg)	DV QUAL [4]	DETECTION LIMIT (ug/kg) [5]	EXCEEDENCE QUOTIENT [6]
Phenanthrene	100	BOTH	2/9	**NBS2-SB06**	**110**	J	200	**1.10**
				NBS2-SB02	**140**	J	200	**1.40**
Pyrene	100	BOTH	6/9	**NBS2-SB05**	**130**	J	220	**1.30**
				NBS2-SB04	**180**	J	180	**1.80**
				NBS2-SB01	**270**	J	180	**2.70**
				NBS2-SB02	**400**		200	**4.00**
				NBS2-SB09	**590**		180	**5.90**
				NBS2-SB06	**620**		200	**6.20**

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Aluminum	1	FL	9/9	**NBS2-SB04**	**3310**		2.3	**3310.00**
				NBS2-SB03	**3560**		2.6	**3560.00**
				NBS2-SB06	**4320**		3	**4320.00**
				NBS2-SB08	**5490**		2.4	**5490.00**
				NBS2-SB09	**5650**		2.4	**5650.00**
				NBS2-SB01	**5670**		2.3	**5670.00**
				NBS2-SB05	**6130**		2.9	**6130.00**
				NBS2-SB07	**6330**		2.4	**6330.00**
				NBS2-SB02	**85800**		2.5	**85800.00**

TABLE 3-8

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Antimony	0.48	FL	3/9	**NBS2-SB01**	**2.6**	K	1.9	**5.42**
				NBS2-SB07	**4.9**	J	2	**10.21**
				NBS2-SB02	**31**		2.1	**64.58**
Beryllium	0.02	FL	4/9	**NBS2-SB04**	**0.23**	J	0.21	**11.50**
				NBS2-SB09	**0.23**	J	0.22	**11.50**
				NBS2-SB07	**0.38**	J	0.22	**19.00**
				NBS2-SB02	**7.2**		0.23	**360.00**
Cadmium	2.5	FL	2/9	**NBS2-SB05**	**3.3**		0.26	**1.32**
				NBS2-SB02	**28.5**		0.23	**11.40**
Chromium	0.0075	FN	9/9	**NBS2-SB03**	**8.6**		0.24	**1146.67**
				NBS2-SB08	**9.6**		0.22	**1280.00**
				NBS2-SB04	**12**		0.21	**1600.00**
				NBS2-SB09	**14.1**		0.22	**1880.00**
				NBS2-SB06	**15.6**		0.28	**2080.00**
				NBS2-SB05	**17.7**		0.26	**2360.00**
				NBS2-SB01	**18.1**		0.21	**2413.33**
				NBS2-SB07	**35**		0.22	**1666.67**
				NBS2-SB02	**561**		0.23	**47800.00**
Copper	15	FL	9/9	**NBS2-SB08**	**23.3**		0.22	**1.55**
				NBS2-SB04	**26.9**		0.21	**179**
				NBS2-SB09	**56.4**		0.22	**3.76**
				NBS2-SB06	**56.8**		0.28	**3.79**
				NBS2-SB01	**167**		0.21	**11.13**
				NBS2-SB05	**179**		0.26	**11.93**
				NBS2-SB07	**531**		0.22	**35.40**
				NBS2-SB02	**9710**		0.23	**647.33**

TABLE 3-8

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Iron	12	FN	9/9	**NBS2-SB03**	**3260**		6.4	**271.67**
				NBS2-SB07	**4530**		6	**377.50**
				NBS2-SB06	**4990**		7.4	**415.83**
				NBS2-SB08	**5240**		6	**436.67**
				NBS2-SB01	**5670**		5.6	**472.50**
				NBS2-SB04	**6850**		5.8	**570.83**
				NBS2-SB05	**7050**		7.1	**587.50**
				NBS2-SB09	**7530**		5.9	**627.50**
				NBS2-SB02	**48100**		6.3	**4008.33**
Lead	0.01	FN	9/9	**NBS2-SB03**	**7.2**		0.71	**720.00**
				NBS2-SB08	**27.1**		0.67	**2710.00**
				NBS2-SB09	**37.9**		0.66	**3790.00**
				NBS2-SB06	**39.8**		0.83	**3980.00**
				NBS2-SB04	**42.6**		0.64	**4260.00**
				NBS2-SB05	**69.4**		0.78	**6940.00**
				NBS2-SB01	**98.6**		0.62	**9860.00**
				NBS2-SB07	**160**		0.67	**16000.00**
				NBS2-SB02	**1260**		0.7	**126000.00**
Manganese	330	BOTH	1/9	**NBS2-SB02**	**477**		0.23	**1.45**
Nickel	2	FL	9/9	**NBS2-SB08**	**3.4**	J	0.67	**1.70**
				NBS2-SB03	**4.6**	K	0.71	**2.30**
				NBS2-SB04	**6.5**	J	0.64	**3.25**
				NBS2-SB06	**6.6**	J	0.83	**3.30**
				NBS2-SB09	**8.9**		0.66	**4.45**
				NBS2-SB05	**10.4**	J	0.78	**5.20**
				NBS2-SB01	**18.2**		0.62	**9.10**
				NBS2-SB07	**37.9**		0.67	**18.95**
				NBS2-SB02	**1140**		0.7	**570.00**

TABLE 3-8

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg)[1]		FREQUENCY OF EXCEEDENCE[2]	LOCATION OF EXCEEDENCE[3]	ANALYTICAL RESULT (mg/kg)	DV QUAL[4]	DETECTION LIMIT (mg/kg)[5]	EXCEEDENCE QUOTIENT[6]
Selenium	1.8	BOTH	1/9	**NBS2-SB02**	**13.5**		1.2	**7.50**
Silver	0.0000098	FL	5/9	**NBS2-SB09**	**0.51**	J	0.44	**52040.82**
				NBS2-SB05	**1.4**	J	0.52	**142857.14**
				NBS2-SB01	**1.5**	K	0.41	**153061.22**
				NBS2-SB07	**6.2**		0.45	**632653.06**
				NBS2-SB02	**88.2**		0.46	**9000000.00**
Vanadium	0.5	FL	9/9	**NBS2-SB07**	**8.9**	J	0.22	**17.80**
				NBS2-SB06	**9.3**	J	0.28	**18.60**
				NBS2-SB03	**9.4**	K	0.24	**18.80**
				NBS2-SB05	**10.6**	J	0.26	**21.20**
				NBS2-SB01	**11.4**	K	0.21	**22.80**
				NBS2-SB04	**13**		0.21	**26.00**
				NBS2-SB08	**14.3**		0.22	**28.60**
				NBS2-SB09	**15.7**		0.22	**31.40**
				NBS2-SB02	**23.5**		0.23	**47.00**
Zinc	10	FL	9/9	**NBS2-SB08**	**20.3**		0.44	**2.03**
				NBS2-SB03	**47.3**		0.47	**4.73**
				NBS2-SB06	**62.9**		0.55	**6.29**
				NBS2-SB09	**91.1**		0.44	**9.11**
				NBS2-SB07	**130**		0.45	**13.00**
				NBS2-SB05	**140**		0.52	**14.00**
				NBS2-SB04	**145**		0.43	**14.50**
				NBS2-SB01	**165**		0.41	**16.50**
				NBS2-SB02	**2350**		0.46	**235.00**

TABLE

Footnotes:
1 - The most conservative screening level was used to determine exceedences. "FN" indicates that the BTAG fauna screening level was used, FL" indicates that the BTAG flora screening level was used, and "BOTH" Indicates that the BTAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-9

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	RBC INDUSTRIAL SOIL SCREENING LEVEL (mg/kg)		FREQUENCY OF EXCEEDENCE[1]	LOCATION OF EXCEEDENCE[2]	ANALYTICAL RESULT (mg/kg)	DV QUAL[3]	DETECTION LIMIT (mg/kg)[4]	EXCEEDENCE QUOTIENT[5]
Arsenic	3.8	RBC IND	5/5	**SL-7-1.5**	**9.3**		1	**2.45**
				SL-10-2.5	**9.4**		1.2	**2.47**
				SL-9-4.0	**10.7**		1.1	**2.82**
				SL-6-1.0	**12.2**		0.97	**3.21**
				SL-8-3.5	**18.2**		1	**4.79**
Beryllium	1.3	RBC IND	5/5	**SL-7-1.5**	**4.6**		0.25	**3.54**
				SL-6.1.0	**5.3**		0.24	**4.08**
				SL.8-3.5	**9.9**		0.25	**7.62**
				SL-10-2.5	**10.3**		0.29	**7.92**
				SL-9-4.0	**31.6**		0.28	**24.31**

Footnotes:
1 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
2 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
3 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed identification.
4 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used. For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
5 - Exceedence Quotient = analytical result / screening level.

TABLE 3-10

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Aluminum	1	FL	**5/5**	**SL-8-3.5**	**147000**		1.5	**147000.00**
				SL-10.2.5	**152000**		1.7	**152000.00**
				SL-9-4.0	**155000**		1.7	**155000.00**
				SL-6-1.0	**168000**		1.5	**168000.00**
				SL-7-1.5	**176000**		1.5	**176000.00**
Antimony	0.48	FL	**5/5**	**SL-9-4.0**	**87.7**		1.1	**182.71**
				SL-10-2.5	**94.2**		1.2	**196.25**
				SL-7-1.5	**105**		1	**218.75**
				SL-8-3.5	**223**		1	**464.58**
				SL-6-1.0	**240**		0.97	**500.00**
Barium	440	BOTH	**1/5**	**SL-9.4.0**	**476**		0.28	**1.08**
Beryllium	0.02	FL	**5/5**	**SL-7-1.5**	**4.6**		0.25	**230.00**
				SL-6-1.0	**5.3**		0.24	**265.00**
				SL-8-3.5	**9.9**		0.25	**495.00**
				SL-10-2.5	**10.3**		0.29	**515.00**
				SL-9-4.0	**31.6**		0.28	**1580.00**
Cadmium	2.5	FL	**5/5**	**SL-8-3.5**	**55.2**		0.25	**22.08**
				SL-10-2.5	**60.6**		0.29	**24.24**
				SL-7-1.5	**73.7**		0.25	**29.48**
				SL-9-4.0	**76.8**		0.28	**30.72**
				SL-6.1.0	**109**		0.24	**43.60**
Chromium	0.0075	FN	**5/5**	**SL-9-4.0**	**1220**		0.55	**162666.67**
				SL-6-1.0	**1410**		0.49	**188000.00**
				SL-7-1.5	**1420**		0.51	**189333.33**
				SL-10-2.5	**1570**		0.58	**209333.33**
				SL-8-3.5	**1940**		0.5	**258666.67**
Cobalt	100	FL	**1/5**	**SL-10-2.5**	**145**		0.29	**1.45**

TABLE 3-10

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Copper	15	FL	**5/5**	**SL-10.2.5**	**23200**		0.58	**1546.67**
				SL-8-3.5	**39000**		0.5	**2600.00**
				SL-7-1.5	**41800**		0.51	**2786.67**
				SL-6-1.0	**42400**		0.49	**2826.67**
				SL-9-4.0	**78400**		0.55	**5226.67**
Iron	12	FN	**5/5**	**SL-10-2.5**	**39600**		5.2	**3300.00**
				SL-9-4.0	**52800**		5	**4400.00**
				SL-7-1.5	**56700**		4.6	**4725.00**
				SL-6-1.0	**60200**		4.4	**5016.67**
				SL-8-3.5	**111000**		4.5	**9250.00**
Lead	0.01	FN	**5/5**	**SL-10-2.5**	**3820**		0.58	**382000.00**
				SL-9-4.0	**5420**		0.55	**542000.00**
				SL-8-3.5	**5990**		0.5	**599000.00**
				SL-7-1.5	**7440**		0.51	**744000.00**
				SL-6.1.0	**9820**		0.49	**982000.00**
Manganese	330	BOTH	**5/5**	**SL-9.4.0**	**964**		0.28	**2.92**
				SL-10.2.5	**977**		0.29	**2.96**
				SL-7.1.5	**1180**		0.25	**3.58**
				SL-6.1.0	**1300**		0.24	**3.94**
				SL-8.3.5	**1390**		0.25	**4.21**
Mercury	0.058	BOTH	**1/5**	**SL-10-2.5**	**0.45**		0.15	**7.76**
Nickel	2	FL	**5/5**	**SL-7-1.5**	**1630**		0.76	**815.00**
				SL-8-3.5	**1710**		0.76	**855.00**
				SL-6.1.0	**2010**		0.73	**1005.00**
				SL-10-2.5	**2220**		0.87	**1110.00**
				SL-9-4.0	**7140**		0.83	**3570.00**
Selenium	1.8	BOTH	**5/5**	**SL-6-1.0**	**11.2**		1.2	**6.22**
				SL-8-3.5	**13.6**		1.3	**7.56**

TABLE 3-10

SUBSURFACE SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Selenium	1.8	BOTH	5/5	**SL-9-4.0**	**15.8**		1.4	**8.78**
				SL-7-1.5	**16.7**		1.3	**9.28**
				SL-10-2.5	**27.3**		1.5	**15.17**
Silver	0.0000098	FL	5/5	**SL-7-1.5**	**144**		0.51	**14693877.55**
				SL-9-4.0	**156**		0.55	**15918.67.35**
				SL-8-3.5	**168**		0.5	**17142857.14**
				SL-10-2.5	**187**		0.58	**19081632.65**
				SL-6-1.0	**289**		0.49	**29489795.92**
Thallium	0.001	FL	2/5	**SL-7-1.5**	**1.3**	J	1.3	**1300.00**
				SL-9-4.0	**1.7**	J	1.4	**1700.00**
Vanadium	0.5	FL	5/5	**SL-6-1.0**	**20.8**		0.24	**41.60**
				SL-7-1.5	**22.4**		0.25	**44.80**
				SL-9-4.0	**24.2**		0.28	**48.40**
				SL-8-3.5	**26.8**		0.25	**53.60**
				SL-10-2.5	**35.3**		0.29	**70.60**
Zinc	10	FL	5/5	**SL-8-3.5**	**4260**		0.5	**426.00**
				SL-10-2.5	**4600**		0.58	**460.00**
				SL-7-1.5	**8500**		0.51	**850.00**
				SL-6-1.0	**8940**		0.49	**894.00**
				SL-9-4.0	**11500**		0.55	**1150.00**

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" Indicates that the BTAG fauna screening level was used, "FL" indicates that the BTAG flora screening level was used, and "BOTH" Indicates that the BTAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high.

TABLE 3-10

"L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW Is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-11

SURFACE BACKGROUND SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, ARPIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Aluminum	1	FL	5/5	**SL03-.5**	**4350**		1.4	**4350.00**
				SL02-.5	**6060**		1.3	**6060.00**
				SL01-.5	**7860**		1.4	**7860.00**
				SL05-.5	**8240**		1.4	**8240.00**
				SL05-.5D	**8620**		1.5	**8620.00**
Beryllium	0.02	FL	2/5	**SL05-.5D**	**0.28**	**J**	0.25	**14.00**
				SL05-.5	**0.44**	**J**	0.23	**22.00**
Chromium	0.0075	FN	5/5	**SL03-.5**	**5.2**		0.46	**693.33**
				SL02-.5	**7**		0.44	**933.33**
				SL05-.5	**8.3**		0.47	**1106.67**
				SL05-.5D	**8.8**		0.5	**1173.33**
				SL01-.5	**9.4**		0.48	**1253.33**
Copper	15	FL	1/5	**SL01-.5**	**20.8**		0.48	**1.39**
Iron	12	FN	5/5	**SL03-.5**	**1710**		4.2	**142.50**
				SL02-.5	**3480**		3.9	**290.00**
				SL05-.5	**3920**		4.2	**326.67**
				SL05-.5D	**4010**		4.5	**334.17**
				SL01-.5	**4670**		4.3	**389.17**
Lead	0.01	FN	5/5	**SL03-.5**	**9.9**		0.46	**990.00**
				SL02-.5	**10.3**		0.44	**1030.00**
				SL05-.5D	**12.1**		0.5	**1210.00**
				SL05-.5	**16**		0.47	**1600.00**
				SL01-.5	**16.7**		0.48	**1670.00**
Nickel	2	FL	4/5	**SL02-.5**	**2.9**	**J**	0.65	**1.4500**
				SL05-.5	**3.4**	**J**	0.7	**1.7000**
				SL05-.5D	**3.8**	**J**	0.74	**1.9000**
				SL01-.5	**4.1**	**J**	0.72	**2.0500**

TABLE 3-11

SURFACE BACKGROUND SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, ARPIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Vanadium	5	FL	**5/5**	**SL03-.5**	**7.6**	**J**	0.23	**1.5200**
				SL02-.5	**10.9**		0.22	**2.1800**
				SL05-.5	**14.7**		0.23	**2.9400**
				SL01-.5	**14.9**		0.24	**2.9800**
				SL05-.5D	**15.3**		0.25	**3.0600**
Zinc	10	FL	**5/5**	**SL02-.5**	**25.8**		0.44	**2.5800**
				SL05-.5D	**27.6**		0.5	**2.7600**
				SL05-.5	**37.1**		0.47	**3.7100**
				SL01-.5	**40.9**		0.48	**4.0900**
				SL03-.5	**42**		0.46	**4.2000**

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" Indicates that the BTAG fauna screening level was used, "FL" indicates that the BTAG flora screening level was used, and "BOTH" Indicates that the BTAG fauna and flora s creening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-12

SUBSURFACE BACKGROUND SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, ARPIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Aluminum	1	FL	**5/5**	**SL01-1.5**	**1290**		1.5	**1290.00**
				SL04-1.5	**3220**		1.4	**3220.00**
				SL02-1.5	**3460**		1.4	**3460.00**
				SL03-1.5	**3930**		1.4	**3900.00**
				SL05-1.5	**12900**		1.3	**12900.00**
Chromium	0.0075	FN	**5/5**	**SL01-1.5**	**2.4**	**J**	0.51	**320.00**
				SL04-1.5	**3.2**		0.48	**426.67**
				SL03-1.5	**4.2**		0.45	**560.00**
				SL02-1.5	**4.4**		0.46	**586.67**
				SL05-1.5	**14.4**		0.43	**1920.00**
Iron	12	FN	**5/5**	**SL01-1.5**	**803**		4.6	**66.92**
				SL04-1.5	**981**		4.3	**81.75**
				SL03-1.5	**1510**		4.1	**125.83**
				SL02-1.5	**1730**		4.1	**144.17**
				SL05-1.5	**6600**		3.9	**550.00**
Lead	0.01	FN	**5/5**	**SL03-1.5**	**3.3**		0.45	**330.00**
				SL05-1.5	**7.4**		0.43	**740.00**
				SL02-1.5	**7.5**		0.46	**750.00**
				SL04-1.5	**9**		0.48	**900.00**
				SL01-1.5	**9.5**		0.51	**950.00**
Nickel	2	FL	**1/5**	**SL05-1.5**	**4.7**	**J**	0.65	**2.35**

TABLE 3-12

SUBSURFACE BACKGROUND SOIL SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, ARPIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SOIL SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Vanadium	0.5	FL	**5/5**	**SL01-1.5**	**3.4**	J	0.26	**6.80**
				SL04-1.5	**4.7**	J	0.24	**9.40**
				SL02-1.5	**5.8**	J	0.23	**11.60**
				SL03-1.5	**6.1**	J	0.23	**12.20**
				SL05-1.5	**20.1**		0.22	**40.20**
Zinc	10	FL	**5/5**	**SL03-1.5**	**19.3**		0.45	**1.93**
				SL04-1.5	**21**		0.48	**2.10**
				SL01-1.5	**22.5**		0.51	**2.25**
				SL05-1.5	**23.2**		0.43	**2.32**
				SL02-1.5	**24**		0.46	**2.40**

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" Indicates that the BTAG fauna screening level was used, "FL" indicates that the BTAG flora screening level was used, and "BOTH" Indicates that the BTAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses - Contract Required Quantitation Limit (CROW for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-13

SEDIMENT SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SOIL SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

ORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
4,4'-DDE	2.2	BOTH	**3/9**	**NBS2-SD04**	**3.9**	J	4.1152	**1.77**
				NBS2-SD07	**9.4**		7.0922	**4.27**
				NBS2-SD06	**13**		6.8027	**5.91**

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENINGLEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Arsenic	0.057	FN	**8/9**	**NBS2-SD04**	**2.2**	J	5.5	**38.60**
				NBS2-SD07	**7.3**		5.5	**128.07**
				NBS2-SD06	**7.8**		5.4	**136.84**
				NBS2-SD05	**9.7**		5.4	**170.18**
				NBS2-SD01	**14**		6.3	**245.61**
				NBS2-SD01P	**14**		6.3	**245.61**
				NBS2-SD03	**20.9**		7.7	**366.67**
				NBS2-SD08	**25.3**		7.7	**443.86**
Cadmium	1.2	FN	**9/9**	**NBS2-SD04**	**4.4**		0.24	**3.67**
				NBS2-SD06	**7.2**		0.41	**6.00**
				NBS2-SD08	**7.8**		0.85	**6.50**
				NBS2-SD03	**8.3**		0.69	**6.92**
				NBS2-SD01	**9.1**		0.61	**7.58**
				NBS2-SD01P	**9.4**		0.6	**7.83**
				NBS2-SD07	**10.7**		0.43	**8.92**
				NBS2-SD02	**16**		0.7	**13.33**
				NBS2-SD05	**28.8**		0.83	**24.00**

TABLE 3-13

SEDIMENT SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SEDIMENT SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Chromium	0.005	FL	**9/9**	**NBS2-SD04**	**33.7**		0.24	**6740.00**
				NBS2-SD06	**33.7**		0.41	**6740.00**
				NBS2-SD07	**40.2**		0.43	**8040.00**
				NBS2-SD08	**55.7**		0.85	**11140.00**
				NBS2-SD03	**65.4**		0.69	**13080.00**
				NBS2-SD01 P	**73.5**		0.6	**14700.00**
				NBS2-SD01	**73.8**		0.61	**14760.00**
				NBS2-SD02	**79.8**		0.7	**15960.00**
				NBS2-SD05	**97**		0.83	**19400.00**
Copper	34	FN	**9/9**	**NBS2-SD07**	**189**	J	0.43	**5.56**
				NBS2-SD08	**263**		0.85	**7.74**
				NBS2-SD06	**273**		0.41	**8.03**
				NBS2-SD03	**295**		0.69	**8.68**
				NBS2-SD01	**335**		0.61	**9.85**
				NBS2-SD01 P	**335**		0.6	**9.85**
				NBS2-SD04	**461**		0.24	**13.56**
				NBS2-SD02	**830**		0.7	**24.41**
				NBS2-SD05	**1150**		0.83	**33.82**
Lead	46.7	FN	**9/9**	**NBS2-SD04**	**129**		0.73	**2.76**
				NBS2-SD07	**271**		1.3	**5.80**
				NBS2-SD08	**280**		2.6	**6.00**
				NBS2-SD06	**334**		1.2	**7.15**
				NBS2-SD03	**336**		2.1	**7.19**
				NBS2-SD01P	**425**		1.8	**9.10**
				NBS2-SD01	**433**		1.8	**9.27**
				NBS2-SD02	**455**		2.1	**9.74**
				NBS2-SD05	**549**		2.5	**11.76**

TABLE 3-13

SEDIMENT SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SEDIMENT SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (mg/kg) 1		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Nickel	20.9	BOTH	**7/9**	**NBS2-SD08**	**26.5**	**J**	2.6	**1.27**
				NBS2-SD03	**28.4**		2.1	**1.36**
				NBS2-SD01	**29.8**		1.8	**1.43**
				NBS2-SD01P	**30.4**		1.8	**1.45**
				NBS2-SD04	**33.5**		0.73	**1.60**
				NBS2-SD02	**46.5**		2.1	**2.22.**
				NBS2-SD05	**62.7**		2.5	**3.00**
Silver	1	FN	**9/9**	**NBS2-SD07**	**2.6**	**J**	0.86	**2.60**
				NBS2-SD03	**3.1**	**J**	1.4	**3.10**
				NBS2-SD08	**3.2**	**J**	1.7	**3.20**
				NBS2-SD06	**3.3**	**J**	0.82	**3.30**
				NBS2-SD01	**3.7**	**J**	1.2	**3.70**
				NBS2-SD01P	**3.8**		1.2	**3.80**
				NBS2-SD04	**6**		0.48	**6.00**
				NBS2- SD02	**11.8**		1.4	**11.80**
				NBS2-SD05	**13.4**		1.7	**13.40**
Zinc	150	FN	**9/9**	**NBS2-SD06**	**168**		0.82	**1.12**
				NBS2-SD04	**243**		0.48	**1.62**
				NBS2-SD07	**308**		0.86	**2.05**
				NBS2-SD08	**583**		1.7	**3.89**
				NBS2-SD03	**607**		1.4	**4.05**
				NBS2-SD01	**686**		1.2	**4.57**
				NBS2-SD01P	**698**		1.2	**4.65**
				NBS2-SD02	**772**		1.4	**5.15**
				NBS2-SD05	**1040**		1.7	**6.93**

TABLE 3-13

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" indicates that the BTAG fauna screening level was used, "FL" Indicates that the BTAG flora screening level was used, and "BOTH" Indicates that the BTAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used. For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-14

SEDIMENT SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SEDIMENT SCREENING LEVELS
NBN SITE 2, APRIL 1997

ORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/kg)	DV QUAL [4]	DETECTION LIMIT (ug/kg) [5]	EXCEEDENCE QUOTIENT [6]
4,4'-DDE	16	FN	**2/12**	**NBS2-SD23**	**22**	**J**	4.57	**1.38**
				NBS2-SD14	**140**		12.82	**8.75**
4,4'-DDE	2.2	BOTH	**7/12**	**NBS2-SD11**	**2.8**	**J**	5.85	**1.27**
				NBS2-SD09	**5.7**		5.38	**2.59**
				NBS2-SD12	**11**	**J**	6.94	**5.00**
				NBS2-SD13	**14**	**J**	9.80	**6.36**
				NBS2-SD23	**18**		4.57	**8.18**
				NBS2-SD17	**19**		12.82	**8.64**
				NBS2-SD14	**31**		12.82	**14.09**

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (mg/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Arsenic	0.057	FN	**17/17**	**NBS2-SD15**	**0.93**	**J**	0.88	**16.32**
				NBS2-SD16	**1.4**		0.86	**24.56**
				NBS2-SD16D	**1.4**	**J**	0.92	**24.56**
				NBS2-SD15D	**1.5**		0.88	**26.32**
				NBS2-SD10	**3.4**		0.81	**59.65**
				NBS2-SD23	**3.8**		0.82	**66.67**
				NBS2-SD11	**5.3**		1.00	**92.98**
				NBS2-SDO9	**5.6**		0.96	**98.25**
				NBS2-SD12	**7.9**		1.20	**138.60**
				NBS2-SD13	**8.9**		1.70	**156.14**
				NBS2-SD14	**9.2**		1.70	**161.40**

TABLE 3-14

SEDIMENT SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SEDIMENT SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (ug/kg) [1]		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (ug/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) [5]	EXCEEDENCE QUOTIENT [6]
Arsenic	0.057	FN	**17/17**	**NBS2-SD22**	**12.6**		2.30	**221.05**
				NBS2-SD21	**15.8**		2.30	**277.19**
				NBS2-SD19	**17.9**		2.20	**314.04**
				NBS2-SD18	**18.3**		2.20	**321.05**
				NBS2-SD17	**19.4**		2.30	**340.35**
				NBS2-SD20	**20**		3.30	**350.88**
Cadmium	1.2	FN	**13/17**	**NBS2-SD23**	**2.5**		0.14	**2.08**
				NBS2-SD14	**7.7**		0.38	**6.42**
				NBS2-SD18	**8.7**		0.36	**7.25**
				NBS2-SD21	**8.7**		0.39	**7.25**
				NBS2-SD22	**9**		0.37	**7.50**
				NBS2-SD17	**10.3**		0.39	**8.58**
				NBS2-SD19	**11**		0.39	**9.17**
				NBS2-SD20	**12.4**		0.54	**10.33**
				NBS2-SD10	**12.8**		0.13	**10.67**
				NBS2-SD11	**15.2**		0.17	**12.67**
				NBS2-SD12	**21.4**		0.21	**17.83**
				NBS2-SD13	**25.3**		0.29	**21.08**
				NBS2-SD09	**48.1**		0.16	**40.08**
Chromium	0.005	FL	**17/17**	**NBS2-SD15**	**4.4**		0.15	**880.00**
				NBS2-SD15D	**4.5**		0.15	**900.00**
				NBS2-SD16	**5.2**		0.14	**1040.00**
				NBS2-SD16D	**5.8**		0.15	**1160.00**
				NBS2-SD23	**21.8**		0.14	**4360.00**
				NBS2-SD14	**40.7**		0.38	**8140.00**
				NBS2-SD22	**55.7**		0.37	**11140.00**
				NBS2-SD21	**55.8**		0.39	**11160.00**
				NBS2-SD11	**72.4**		0.17	**14480.00**
				NBS2-SD20	**75.8**		0.54	**15160.00**

TABLE 3-14

SEDIMENT SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SEDIMENT SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (mg/kg) 1		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Chromium	0.005	FL	**17/17**	**NBS2-SD19**	**77.8**		0.39	**15560.00**
				NBS2-SD17	**77.9**		0.39	**15580.00**
				NBS2-SD10	**81**		0.13	**16200.00**
				NBS2-SD18	**83.3**		0.36	**16660.00**
				NBS2-SD12	**87.2**		0.21	**17440.00**
				NBS2-SD13	**89.3**		0.29	**17860.00**
				NBS2-SD09	**292**		0.16	**58400.00**
Copper	34	FN	**13/17**	**NBS2-SD23**	**117**		0.14	**3.44**
				NBS2-SD22	**209**		0.37	**6.15**
				NBS2-SD14	**235**		0.38	**6.91**
				NBS2-SD21	**245**		0.39	**7.21**
				NBS2-SD20	**343**		0.54	**10.09**
				NBS2-SD18	**361**		0.36	**10.62**
				NBS2-SD19	**361**		0.39	**10.62**
				NBS2-SD17	**385**		0.39	**11.32**
				NBS2-SD11	**863**		0.17	**25.38**
				NBS2-SD13	**876**		0.29	**25.76**
				NBS2-SD12	**1040**		0.21	**30.59**
				NBS2-SD10	**1060**		0.13	**31.18**
				NBS2-SDO9	**5510**		0.16	**162.06**
Lead	46.7	FN	**13/17**	**NBS2-SD23**	**153**		0.27	**3.28**
				NBS2-SD14	**203**		0.76	**4.35**
				NBS2-SD21	**232**		0.78	**4.97**
				NBS2-SD22	**232**		0.75	**4.97**
				NBS2-SD11	**277**		0.35	**5.93**
				NBS2-SD10	**303**		0.27	**6.49**
				NBS2-SD20	**400**		1.10	**8.57**
				NBS2-SD12	**408**		0.41	**8.74**
				NBS2-SD17	**418**		0.77	**8.95**

TABLE 3-14

SEDIMENT SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SEDIMENT SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (mg/kg) 1		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Nickel	20.9	BOTH	**6/17**	**NBS2-SD19**	**426**		0.78	**9.12**
				NBS2-SD13	**438**		0.58	**9.38**
				NBS2-SD18	**457**		0.72	**9.79**
				NBS2-SD09	**3900**		0.32	**83.51**
				NBS2-SD18	**33.6**		0.36	**0.72**
				NBS2-SD11	**39.4**		0.17	**0.84**
				NBS2-SD13	**46.2**		0.29	**0.99**
				NBS2-SD10	**46.3**		0.13	**0.99**
				NBS2-SD12	**47.2**		0.21	**1.01**
				NBS2-SD09	**185**		0.16	**3.96**
Silver	1	FN	**13/17**	**NBS2-SD23**	**1.4**		0.14	**1.40**
				NBS2-SD22	**2.1**	**J**	0.37	**2.10**
				NBS2-SD14	**2.6**	**J**	0.39	**2.60**
				NBS2-SD21	**2.8**	**J**	0.38	**2.80**
				NBS2-SD20	**3.5**	**J**	0.54	**3.50**
				NBS2-SD18	**3.8**	**J**	0.39	**3.80**
				NBS2-SD19	**3.9**		0.36	**3.90**
				NBS2-SD17	**4**		0.39	**4.00**
				NBS2-SD11	**8.4**		0.17	**8.40**
				NBS2-SD13	**9.7**		0.21	**9.70**
				NBS2-SD12	**10.9**		0.29	**10.90**
				NBS2-SD10	**11.1**		0.13	**11.10**
				NBS2-SD09	**34.3**		0.16	**34.30**
Zinc	150	FN	**9/13**	**NBS2-SD10**	**539**		0.40	**3.59**
				NBS2-SD11	**598**		0.52	**3.99**
				NBS2-SD21	**694**		1.20	**4.63**
				NBS2-SD22	**696**		1.10	**4.64**
				NBS2-SD18	**747**		1.10	**4.98**
				NBS2-SD12	**792**		0.62	**5.28**

TABLE 3-14

SEDIMENT SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG SEDIMENT SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG SEDIMENT SCREENING LEVEL (mg/kg) 1		FREQUENCY OF EXCEEDENCE [2]	LOCATION OF EXCEEDENCE [3]	ANALYTICAL RESULT (mg/kg)	DV QUAL [4]	DETECTION LIMIT (mg/kg) 5	EXCEEDENCE QUOTIENT [6]
Zinc	150	FN	**9/13**	**NBS2-SD19**	**798**		1.20	**5.32**
				NBS2-SD13	**951**		0.87	**6.34**
				NBS2-SD09	**1800**		0.48	**12.00**

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" Indicates that the BTAG fauna screening level was used, "FL" indicates that the BTAG flora screening level was used, and "BOTH" Indicates that the STAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID Indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used. For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

SURFACE WATER SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED AMBIENT WATER QUALITY CRITERIA
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	AMBIENT WATER QUALITY CRITERIA (ug/L)		FREQUENCY OF EXCEEDENCE [1]	LOCATION OF EXCEEDENCE [2]	ANALYTICAL RESULT (ug/L)	DV QUAL [3]	DETECTION LIMIT (mg/kg) 4	EXCEEDENCE QUOTIENT [5]
Cadmium	1.1	AWQC	**2/5**	**NBS2-SW03**	**11.1**		1	**10.09**
				NBS2-SW02	**38.6**		1	**35.09**
Iron	1000	AWQC	**5/5**	**NBS2-SW01**	**2160**		27	**2.16**
				NBS2-SW04	**2690**		27	**2.69**
				NBS2-SW01P	**4530**		27	**4.53**
				NBS2-SW03	**26900**		27	**26.90**
				NBS2-SW02	**49500**		27	**49.50**
Lead	3.2	AWQC	**3/5**	**NBS2-SW04**	**21.6**		3	**6.75**
				NBS2-SW03	**331**		3	**103.44**
				NBS2-SW02	**1190**		3	**371.88**
Silver	0.92	AWQC	**2/5**	**NBS2-SW03**	**4.6**	**J**	2	**5.00**
				NBS2-SW02	**32.9**		2	**35.76**
Zinc	110	AWQC	**2/5**	**NBS2-SW03**	**742**		2	**6.75**
				NBS2-SW02	**1900**		2	**17.27**

Footnotes:
1 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed AWQC / the number of samples collected and analyzed for the chemical.
2 - An “F” at the end of a sample ID Indicates that the sample was filtered during collection. A “P. or a “D” at the end of a sample ID indicates a duplicate sample.
3 - Data Validation Qualifiers: “J” = Analyte present - reported value may not be accurate or precise. “K” = Analyte present - reported value may be biased high. “L” = Analyte present - reported value may be reported low. No code = Confirmed Identification.
4 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used. For inorganic analyses - Contract Required Detection Limit (CRDL) for EPA CLP SOW is used.
5 - Exceedence Quotient = analytical result / AWQC.

TABLE 3-16

SURFACE WATER SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG FRESH WATER SCREENING LEVELS
NBN SITE 2, SEPTEMBER 1996

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG FRESH WATER SCREENING LEVEL (ug/L) [1]		FREQUENCY OF EXCEEDENCE [1]	LOCATION OF EXCEEDENCE [2]	ANALYTICAL RESULT (ug/L)	DV QUAL [3]	DETECTION LIMIT (ug/L) [4]	EXCEEDENCE QUOTIENT [5]
Aluminum	25	FN	3/5	NBS2-SW04	519		11	20.76
				NBS2-SW03	12900		11	516.00
				NBS2-SW02	47400		11	1896.00
Cadmium	0.53	FN	3/5	NBS2-SW04	1.1	J	1	2.08
				NBS2-SW03	11.1		1	20.94
				NBS2-SW02	38.6		1	72.83
Chromium	2	FL		NBS2-SW04	2.1	J	1	1.05
				NBS2-SW03	43		1	21.50
				NBS2-SW02	134		1	67.00
Copper	6.5	FN		NBS2-SW02	2120		1	326.15
Lead	3.2	FN		NBS2-SW04	21.6		3	6.75
				NBS2-SW03	331		3	103.44
				NBS2-SW02	1190		3	371.88
Silver	0.0001	FN		NBS2-SW03	4.6	J	2	46000.00
				NBS2-SW02	32.9		2	329000.00
Zinc	30	FL		NBS2-SW03	742		2	24.73
				NBS2-SW02	1900		2	63.33

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" Indicates that the BTAG fauna screening level was used, "FL" indicates that the BTAG flora screening level was used, and "BOTH" Indicates that the BTAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P" or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed identification.
5 - For organic analyses - Contract Required Quantitation Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used. For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW is used.
6 - Exceedence Quotient = analytical result / screening level.

TABLE 3-18

SURFACE WATER SAMPLING RESULTS
SUMMARY OF DETECTED CHEMICALS THAT EXCEED BTAG FRESH WATER SCREENING LEVELS
NBN SITE 2, APRIL 1997

INORGANICS

CHEMICAL	MOST CONSERVATIVE BTAG FRESH WATER SCREENING LEVEL (ug/L) [1]		FREQUENCY OF EXCEEDENCE [1]	LOCATION OF EXCEEDENCE [2]	ANALYTICAL RESULT (ug/L)	DV QUAL [3]	DETECTION LIMIT (ug/L) [4]	EXCEEDENCE QUOTIENT [5]
Aluminum	25	FN	4/16	NBS2-SW10	3500	J	4	140.00
				NBS2-SW12	3930	J	4	157.20
				NBS2-SW14	1730	J	4	69.20
				NBS2-SW20	2680	J	4	107.20
Cadmium	0.53	FN	7/16	NBS2-SW09	1.2	J	1	2.26
				NBS2-SW10	8.1		1	15.28
				NBS2-SW11	3.1	J	1	5.85
				NBS2-SW12	6.9		1	13.02
				NBS2-SW13	1.7	J	1	3.21
				NBS2-SW14	2.3	J	1	4.34
				NBS2-SW20	1.5	J	1	2.83
Chromium	2	FL		NBS2-SW11	2.2	J	1	1.10
				NBS2-SW14	2.9	J	1	1.45
				NBS2-SW20	6.3	J	1	3.15
				NBS2-SW10	11.6		1	5.80
				NBS2-SW12	11.6		1	5.80
Lead	3.2	FN		NBS2-SW12	171		2	53.44
				NBS2-SW10	196		2	61.25
Silver	0.0001	FN		NBS2-SW14	1.1	J	1	11000.00
				NBS2-SW09	1.8	J	1	18000.00
				NBS2-SW10	2.1	J	1	21000.00
				NBS2-SW12	2.4	J	1	24000.00
				NBS2-SW19	3.5	J	1	35000.00

TABLE 3-18

Footnotes:
1 - The most conservative screening level was used to determine exceedences. " FN" Indicates that the BTAG fauna screening level was used, "FL" indicates that the BTAG flora screening level was used, and "BOTH" indicates that the BTAG fauna and flora screening levels are the same.
2 - Frequency of Exceedence = the number of samples with chemical concentrations that exceed the most conservative screening level / the number of samples collected and analyzed for the chemical.
3 - An "F" at the end of a sample ID indicates that the sample was filtered during collection. A "P. or a "D" at the end of a sample ID indicates a duplicate sample.
4 - Data Validation Qualifiers: "J" = Analyte present - reported value may not be accurate or precise. "K" = Analyte present - reported value may be biased high. "L" = Analyte present - reported value may be reported low. No code = Confirmed Identification.
5 - For organic analyses - Contract Required Quantitatlon Limit (CRQL) for EPA Contract Lab Program (CLP) Statement of Work (SOW) is used.
For inorganic analyses - Contract Required Detection Limit for EPA CLP SOW Is used.
6 - Exceedence Quotient = analytical result / screening level.

Appendix C

Summary of Media-Specific Human Health Risks and Hazards

Summary of Media-Specific Risks and Hazards
NBN Slag Pile (Site 2)

Media: Groundwater

Chemical	Receptor 1 (e.g., Site Worker)								Receptor 2 (e.g., Construction Worker)							
	HQ				CR				HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Trichloroethene	- -	3.4E-03	- -	**3.4E-03**	- -	8.1E-08	- -	**8.1E-08**	- -	- -	3.7E-02	**3.7E-02**	8.2E-13	- -	8.8E-07	**8.8E-07**
Manganese (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	1.3E-02	**1.3E-02**	- -	- -	- -	**- -**
Selenium (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	7.6E-04	**7.6E-02**	- -	- -	- -	**- -**
Thallium (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	3.1E-02	**3.1E-02**	- -	- -	- -	**- -**
Thallium (F)	- -	8.9E-01	- -	**8.9E-01**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**
Totals	**- -**	**8.9E-01**	**- -**	**8.9E-01**	**- -**	**8.1E-08**	**- -**	**8.1E-08**	**- -**	**- -**	**8.2E-02**	**8.2E-02**	**8.2E-13**	**- -**	**8.8E-07**	**8.8E-07**

Chemical	Receptor 3 (e.g., Agricultural)								Receptor 2 (e.g., Car wash)							
	HQ				CR				HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Trichloroethene	- -	6.5E-05	1.0E-03	**1.1E-03**	3.2E-15	1.5E-09	2.4E-08	**2.6E-08**	- -	8.4E-05	9.7E-04	**1.1E-03**	1.1E-25	1.9E-09	2.2E-08	**2.4E-08**
Manganese (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**
Selenium (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**
Thallium (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**
Thallium (F)	- -	1.7E-02	7.5E-04	**1.8E-02**	- -	- -	- -	**- -**	- -	2.2E-02	5.3E-04	**2.2E-02**	- -	- -	- -	**- -**
Totals	**- -**	**1.7E-02**	**1.8E-03**	**1.9E-02**	**3.2E-15**	**1.5E-09**	**2.4E-08**	**2.6E-08**	**- -**	**2.2E-02**	**1.5E-03**	**2.3E-02**	**1.1E-25**	**1.9E-09**	**2.2E-08**	**2.4E-08**

Media: Surface Soil

Chemical	Receptor 1 (e.g., Site Worker)							
	HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Arsenic	- -	2.2E-02	7.8E-02	**1.0E-01**	3.6E-09	3.5E-06	1.3E-05	**1.6E-05**
Totals	**- -**	**2.2E-02**	**7.8E-02**	**1.0E-01**	**3.6E-09**	**3.5E-06**	**1.3E-05**	**1.6E-05**

Chemical	Receptor 5 (e.g., recreational adolescent)								Receptor 6 (e.g., recreational adult)							
	HQ				CR				HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Benzo[a]pyrene	- -	- -	- -	**- -**	- -	9.0E-08	- -	**9.0E-08**	- -	- -	- -	**- -**	- -	1.6E-07	- -	**1.6E-07**
Arsenic	- -	4.6E-02	5.5E-02	**1.0E-01**	- -	2.7E-06	3.3E-06	**5.9E-06**	- -	2.4E-02	4.7E-02	**7.1E-02**	- -	4.7E-06	9.3E-06	**1.4E-05**
Iron	- -	4.1E-02	- -	**4.1E-02**	- -	- -	- -	**- -**	- -	2.2E-02	- -	**2.2E-02**	- -	- -	- -	**- -**
Totals	**- -**	**8.7E-02**	**5.5E-02**	**1.4E-01**	**- -**	**2.8E-06**	**3.3E-06**	**6.0E-06**	**- -**	**4.6E-02**	**4.7E-02**	**9.3E-02**	**- -**	**4.9E-06**	**9.3E-06**	**1.4E-05**

Summary of Media-Specific Risks and Hazards
NBN Slag Pile (Site 2)

Media: Subsurface Soil

Chemical	Receptor 2 (e.g., Construction Worker)							
	HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Aluminum	2.6E-02	8.3E-01	3.4E-01	**1.2E+00**	- -	- -	- -	**- -**
Antimony	- -	2.8E+00	3.1E+00	**5.9E+00**	- -	- -	- -	**- -**
Arsenic	- -	2.1E-01	7.5E-02	**2.8E-01**	4.2E-10	1.3E-06	5.0E-07	**1.8E-06**
Cadmium	- -	5.1E-01	2.3E+00	**2.8E+00**	1.5E-09	- -	- -	**1.5E-09**
Chromium	5.0E-01	3.0E+00	3.4E+01	**3.7E+01**	1.7E-07	- -	- -	**1.7E-07**
Copper	- -	9.2E+00	1.7E+00	**1.1E+01**	- -	- -	- -	**- -**
Iron	- -	1.6E+00	- -	**1.6E+00**	- -	- -	- -	**- -**
Nickel	- -	1.7E+00	1.9E+00	**3.5E+00**	- -	- -	- -	**- -**
Totals	**5.3E-01**	**2.0E+01**	**4.3E+01**	**6.3E+01**	**1.7E-07**	**1.3E-06**	**5.0E-07**	**2.0E-06**

Media: Surface Water

Chemical	Receptor 5 (e.g., recreational adolescent)								Receptor 6 (e.g., recreational adult)							
	HQ				CR				HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Antimony	- -	6.0E-03	1.1E-02	**1.7E-02**	- -	- -	- -	**- -**	- -	3.2E-03	9.6E-03	**1.3E-02**	- -	- -	- -	**- -**
Arsenic	- -	8.5E-03	1.6E-03	**1.0E-02**	- -	4.9E-07	9.7E-08	**5.9E-07**	- -	4.5E-03	1.4E-03	**5.9E-03**	- -	8.7E-07	2.8E-07	**1.1E-06**
Cadmium	- -	1.2E-02	4.5E-02	**5.7E-02**	- -	- -	- -	**- -**	- -	6.4E-03	3.8E-02	**4.5E-02**	- -	- -	- -	**- -**
Copper	- -	1.4E-03	4.3E-04	**1.8E-03**	- -	- -	- -	**- -**	- -	7.3E-04	3.7E-04	**1.1E-03**	- -	- -	- -	**- -**
Iron	- -	6.1E-02	- -	**6.1E-02**	- -	- -	- -	**- -**	- -	3.2E-02	- -	**3.2E-02**	- -	- -	- -	**- -**
Manganese	- -	6.2E-03	1.2E-03	**7.4E-03**	- -	- -	- -	**- -**	- -	3.3E-03	9.9E-04	**4.3E-03**	- -	- -	- -	**- -**
Thallium	- -	3.1E-02	5.8E-03	**3.7E-02**	- -	- -	- -	**- -**	- -	1.6E-02	4.9E-03	**2.1E-02**	- -	- -	- -	**- -**
Totals	**- -**	**1.3E-01**	**6.5E-02**	**1.9E-01**	**- -**	**4.9E-07**	**9.7E-08**	**5.9E-07**	**- -**	**6.6E-02**	**5.6E-02**	**1.2E-01**	**- -**	**8.7E-07**	**2.8E-07**	**1.1E-06**

Media: Sediment

Chemical	Receptor 5 (e.g., recreational adolescent)								Receptor 6 (e.g., recreational adult)							
	HQ				CR				HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Arsenic	- -	2.0E-02	2.4E-02	**4.4E-02**	- -	1.2E-06	1.4E-06	**2.6E-06**	- -	1.1E-02	2.1E-02	**3.1E-02**	- -	2.0E-06	4.0E-06	**6.0E-06**
Totals	**- -**	**2.0E-02**	**2.4E-02**	**4.4E-02**	**- -**	**1.2E-06**	**1.4E-06**	**2.6E-06**	**- -**	**1.1E-02**	**2.1E-02**	**3.1E-02**	**- -**	**2.0E-06**	**4.0E-06**	**6.0E-06**

Summary of Media-Specific Risks and Hazards
NBN Slag Pile (Site 2)

Media: Background Groundwater

Chemical	Receptor 1 (e.g., Site Worker)								Receptor 2 (e.g., Construction Worker)							
	HQ				CR				HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Aluminum (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	1.4E-02	**1.4E-02**	- -	- -	- -	- -
Antimony (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	7.5E-02	**7.5E-02**	- -	- -	- -	- -
Arsenic (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	3.2E-02	**3.2E-02**	- -	- -	5.1E-06	**5.1E-06**
Cadmium (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	7.3E-01	**7.3E-01**	- -	- -	- -	- -
Chromium (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	3.8E-01	**3.8E-01**	- -	- -	- -	- -
Copper (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	9.2E-03	**9.2E-03**	- -	- -	- -	- -
Iron (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Manganese (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	5.0E-03	**5.0E-03**	- -	- -	- -	- -
Zinc (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	3.9E-03	**3.9E-03**	- -	- -	- -	- -
Aluminum (F)	- -	4.7E-02	- -	**4.7E-02**	- -	- -	- -	**- -**	- -	- -	- -	- -	- -	- -	- -	- -
Antimony (F)	- -	7.2E-02	- -	**7.2E-02**	- -	- -	- -	**- -**	- -	- -	- -	- -	- -	- -	- -	- -
Arsenic (F)	- -	4.2E-01	- -	**4.2E-01**	- -	6.7E-05	- -	**- -**	- -	- -	- -	- -	- -	- -	- -	- -
Iron (F)	- -	5.5E-01	- -	**5.5E-01**	- -	- -	- -	**- -**	- -	- -	- -	- -	- -	- -	- -	- -
Manganese (F)	- -	9.0E-02	- -	**9.0E-02**	- -	- -	- -	**- -**	- -	- -	- -	- -	- -	- -	- -	- -
Totals	**- -**	**1.2E+00**	**- -**	**1.2E+00**	**- -**	**6.7E-05**	- -	**6.7E-05**	- -	- -	**1.3E+00**	**1.3E+00**	- -	- -	**5.1E-06**	**5.1E-06**

Media: Background Groundwater (continued)

Chemical	Receptor 3 (e.g., Agricultural)								Receptor 4 (e.g., Car Wash)							
	HQ				CR				HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Aluminum (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Antimony (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Arsenic (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**
Cadmium (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Chromium (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Copper (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Iron (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Manganese (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Zinc (UF)	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	**- -**	- -	- -	- -	- -
Aluminum (F)	- -	9.0E-04	1.5E-04	**1.0E-03**	- -	- -	- -	**- -**	- -	1.2E-03	1.1E-04	**1.3E-03**	- -	- -	- -	- -
Antimony (F)	- -	1.4E-03	6.1E-04	**2.0E-03**	- -	- -	- -	**- -**	- -	1.8E-03	4.3E-04	**2.2E-03**	- -	- -	- -	- -
Arsenic (F)	- -	7.9E-03	3.7E-04	**8.3E-03**	- -	1.3E-06	6.0E-08	**1.3E-06**	- -	1.0E-02	2.7E-04	**1.1E-02**	- -	1.6E-06	4.1E-08	**1.6E-06**
Iron (F)	- -	1.0E-02	- -	**1.0E-03**	- -	- -	- -	**- -**	- -	1.4E-02	- -	**1.4E-02**	- -	- -	- -	**- -**
Manganese (F)	- -	1.7E-03	7.6E-05	**1.8E-03**	- -	- -	- -	**- -**	- -	2.2E-03	5.4E-05	**2.3E-03**	- -	- -	- -	**- -**
Totals	**- -**	**2.2E+02**	**1.2E-03**	**1.2E+00**	**- -**	**1.3E-06**	**6.0E-08**	**1.3E-06**	- -	**2.9E-02**	**8.6E-04**	**3.0E-02**	- -	**1.6E-06**	**4.1E-08**	**1.6E-06**

Summary of Media-Specific Risks and Hazards
NBN Slag Pile (Site 2)

Media: Background Surface Soil

Chemical	Receptor 5 (e.g., recreational adolescent)								Receptor 6 (e.g., recreational adult)							
	HQ				CR				HQ				CR			
	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total	Inh	Ing	Der	Total
Aluminum	- -	6.4E-03	8.5E-03	**1.5E-02**	- -	- -	- -	**- -**	- -	3.4E-03	7.2E-03	**1.1E-02**	- -	- -	- -	**- -**
Arsenic	- -	3.9E-03	4.7E-03	**8.6E-03**	- -	2.8E-07	2.8E-07	**5.1E-07**	- -	2.1E-03	4.0E-03	**6.1E-03**	- -	4.0E-07	8.0E-07	**1.2E-06**
Totals	**- -**	**1.0E-02**	**1.3E-02**	**2.3E-02**	**- -**	**2.3E-07**	**2.8E-07**	**5.1E-07**	**- -**	**5.5E-03**	**1.1E-02**	**1.7E-02**	**- -**	**4.0E-07**	**8.0E-07**	**1.2E-06**

UF = Unfiltered groundwater samples, evaluated for construction scenario
F = Filtered groundwater samples, evaluated for site worker, agriculture worker, and car wash scenarios
HQ = Hazard Quotient
CR = Cancer Risk
Ing = Ingestion route of exposure
Inh = Inhalation route of exposure
Der = Dermal route of exposure

Final Response to PREQB Comments on the Draft Feasibility Study Report SWMU 6, Former Naval Support Detachment, Vieques, Puerto Rico, Dated, June 2012

General Comments

1. Please provide an overview of the ecological and/or cultural importance, or lack thereof, of this 0.6 acre SWMU, since many of the proposed alternatives essentially involve destruction or significant alteration of the existing environmental/ecological setting of this wetland/open water lagoon area. Establishment of its functional value and relative importance is crucial to the decision-making process. Provide a summary of the terrestrial and aquatic plant diversity, fish and wildlife habitat, shoreline protection, recreational and aesthetic value.

Navy Response:

In Section 2.1, the third paragraph has been replaced by the following (new language underlined):

"The waste pile and contaminated soil were removed during an interim removal action in 2009. The overall goal of the interim removal action was to eliminate the uncertainty of the debris being a potential future source of contamination by removing the debris and associated contaminated soil, where present.

Prior to the removal action, the SWMU 6 site was predominately an estuarine, intertidal, forested wetland dominated by black mangrove and intermittently inundated at high tide. Following the removal action, the site remained as a wetland habitat, but the lowered site topography resulted in a predominantly shallow (approximately 1 foot average) open water lagoon, with deeper portions permanently inundated and supportive of a variety of aquatic fish and invertebrates. Aquatic organisms include anchovies, gobies, puffers, mojarras, mullet, needlefish, snook, blue crabs, hermit crabs, fiddler crab, grass shrimp, and upside-down jellyfish. Extensive shallow areas occur surrounding the SWMU 6 lagoon, especially on the east side, where red and black mangroves are becoming re-established and sediment is exposed at low tide. Various wildlife have been observed foraging along the exposed sediment and shallow water areas including great egret, great blue heron, black-bellied plover, semipalmated plover, ruddy turnstone, and greater yellowlegs. A chain-link fence with signs posted to deter trespassers exists along the southern lagoon boundary, adjacent to the Route 200. There is no boat access to the site; the water connection on the north and west sides of the lagoon is blocked by a thick stand of red mangrove. There is public access (e.g., fishing, kayaking) to the nearby waters of Laguna Kiani via a vehicle/pedestrian bridge and small earthen boat ramp adjacent to the southwest corner of SWMU 6. The new environmental setting at SWMU 6 resulted in changed exposure pathways to human and ecological receptors, relative to pre-removal conditions."

2. The description of the area of former solid waste disposal notes a 260 feet wide by 180 feet long solid waste disposal area along with a second area north of Road 200 described as 200 feet long by 10 feet wide. The area proposed for excavation under alternative 3 is approximately 130 ft x 120 ft. Please provide rationale for difference and provide analytical data and rationale to support no excavation underneath areas formerly occupied by solid waste.

Navy Response:

It is unclear what inconsistency the reviewer perceives. The former solid waste areas were removed during the interim removal action, as described in Section 2.2; the area proposed for excavation under Alternative 3 is based on post-interim-removal-action sediment data, as described in Section 2.3.1.

3. Please provide description of the means/methods of sediment excavation and dewatering for alternatives which involve this method. As noted, sediment excavation and dewatering can be a difficult task and means/methods will have direct implications on cost, effectiveness, and implementability.

Navy Response:

The end of the second sentences of the second bullets for Alternatives 3 (newly labeled Section 6.3) and 6 (newly labeled Section 6.6) have been appended with: "dewatering by sump pumps and well points." Note that both bullets state the details of the lagoon dewatering and backfilling will be articulated in the Remedial Design and Remedial Action (RD/RA) Work Plan, which will be subject to regulatory review and approval and will be prepared upon completion of the ROD should either of these alternative be selected.

PREQB Evaluation of Response:

PREQB acknowledges that specific details regarding excavation/dewatering will be provided in a Remedial Design and Remedial Action (RD/RA) Work Plan, should these activities be part of the selected remedy. However, the feasibility study needs to provide sufficient information on the methods/means that would likely be used for excavation/dewatering to assess the technical and administrative feasibility of implementing these activities as part of the alternative. For example, the detailed evaluation of Alternative 3 indicates that there is uncertainty as to whether an excavation could be dewatered and maintained below sea level to permit the excavation of "dry" sediment. This is a reasonable concern. There may be technical approaches that could be incorporated into the alternative that may reduce this uncertainty. Further evaluation (e.g., analytical modeling which is often performed to evaluate the technical feasibility of an activity) could show that engineering controls are needed to permit dewatering and sediment excavation which have not been included in this alternative but could be cost prohibitive, or that excavation dewatering below sea level to permit excavation of dry sediment is not feasible. Please provide this type of evaluation to define the approach and support the technical and administrative feasibility of dewatering and sediment excavation, and the cost of this alternative.

Navy Response to Evaluation:

After further consideration, it is likely Alternative 6 could be implemented without dewatering the lagoon. Therefore, the discussion for Alternative 6 has been updated to indicate that the initial attempt to install the soil cover will be done without attempting to dewater the lagoon (as is assumed for Alternatives 4 and 5). If successful, no hydraulic controls or dewatering would be necessary. This process may be successful if working outward from the bank and/or with equipment that can "reach" out into the open lagoon to place the soil. However, as a conservative measure, the cost estimate for Alternative 6 (soil cover), as well as Alternative 3 (excavation) assumed dewatering would be required to an average depth of 3 feet of water. Because Alternative 3 is the excavation alternative, dewatering would be necessary and most important for this alternative. Based on the relatively fine-grained material present in and around the lagoon, it is likely that dewatering without hydraulic controls (other than temporarily damming the small direct opening to the larger lagoon complex) would be possible. However, if dewatering for Alternative 3 is deemed necessary, but found not to be feasible to the level of "dryness" necessary for excavation without hydraulic controls, steel sheet piling would likely be required. Assuming perimeter steel sheet

piling is installed up to 10 ft bgs, this would add $400,000 to $500,000 to Alternative 3, associated with installation and removal.

For clarification, the 2nd bullet under Section 6.3 (Alternative 3) has been replaced with the following: "SWMU 6 lagoon dewatering prior to sediment excavation in non-inundated condition. For cost estimating purposes, it is assumed that an average depth of 3 feet of water in SWMU 6 would require dewatering using multiple perimeter well points and sump pumps during the construction phase. In addition, the cost estimation also assumed that the SWMU 6 lagoon would be able to be dewatered under a flowrate up to 300 gallons per minute without using steel sheet piling. The dewatered water would be treated by settling tanks and granular carbon units to remove suspended solids and trace level organics prior to discharge to Lagoon Kiani Complex Lobe. If sheet piling was determined to be necessary in order to dewater the lagoon, the cost could increase by an estimated $400,000 to $500,000 (assuming perimeter installation to 10 ft bgs and removal following excavation). The details of the lagoon dewatering would be articulated in the Remedial Design and Remedial Action (RD/RA) Work Plan, which would be subject to regulatory review and approval, prepared upon completion of the ROD should this alternative be selected."

The 2nd bullet under Section 6.6 (Alternative 6) has been replaced with the following: "It is likely that the previous intertidal forrested wetland could be restored at SWMU 6 without dewatering the lagoon. However, for cost estimating purposes, it is conservatively assumed that an average depth of 3 feet of water in SWMU 6 would require dewatering using multiple perimeter well points and sump pumps during the construction phase. The dewatered water would be treated by settling tanks and granular carbon units to remove suspended solids and trace level organics prior to discharge to Lagoon Kiani Complex Lobe. The details of the lagoon dewatering would be articulated in the Remedial Design and Remedial Action (RD/RA) Work Plan, which would be subject to regulatory review and approval, prepared upon completion of the ROD should this alternative be selected."

PREQB Evaluation of Response to Evaluation:

Please clarify the basis for concluding that Alternative 6 could be implemented without dewatering the lagoon. PREQB is concerned that capping in the wet will cause suspension of contaminated sediments that may resettle on the cap and potentially prevent the attainment of the remedial objectives for this SWMU. This phenomenon has been observed at other Sites where caps have been installed in the wet and has been identified in Section 7.3.6 of the feasibility as a concern. Please provide the rationale for concluding that Alternative 6 could be implemented without dewatering and how re-suspension and contamination of the cap would be prevented.

PREQB also notes that for sheet piling to be effective, the piles would likely need to be keyed into a low permeability soil layer or extended to bedrock (if a low permeability soil layer does not exist) to limit recharge to the excavation or cap area. It is unclear if a low permeability soil layer exists. If not present, sheet piles may need to be extended to bedrock. For cost estimating purposes, the assumption that sheet piling would be installed to a depth of 10 feet bgs is acceptable. However, alternatives requiring dewatering, if selected for the remedy, will need to propose a pre-design investigation to collect the data necessary to quantify groundwater seepage likely to be generated during dewatering and to demonstrate that the proposed design is capable of dewatering the area of remedy implementation throughout the duration of the remedy.

Navy Response:

After further discussion between PREQB and Navy, it was acknowledged that the remedial design for Alternative 6, if selected, will provide the necessary details for installing the soil cover without dewatering. Further, whether it is possible to install the cover without dewatering such that contaminated sediments do not settle on the top of the cover will be demonstrated in the field under oversight by PREQB. If unsuccessful without dewatering, the Navy can perform the necessary dewatering activities.

PREQB Evaluation of Response:

The Navy's response is acceptable with the following qualification. The Navy states that if selected, details for installing a soil cover would be provided in the design document. The Navy further qualifies that if installation of the cover is not successful without dewatering, the Navy can perform the necessary dewatering activities. These statements indicate that there is uncertainty with respect to whether or not the soil cover can be effectively installed in the wet without causing suspension of impacted sediment and settling of this impacted sediment on the surface of the emplaced cover. Should Alternative 6 be implemented, PREQB anticipates that the remedial design will include a pilot study (or other acceptable approach to PREQB that demonstrates that the soil cover can installed without causing the surface of the emplaced cover to be adversely impacted by suspension of contaminated sediment with a contingency for a pre-design investigation to collect parameters needed to design a dewatering system should the pilot demonstration prove unsuccessful. PREQB also anticipates that Alternative 3 would include a pre-design investigation for the design of a dewatering system should that alternative be selected.

4. The estimates of sediment quantities from excavation alternatives are based on a uniform depth profile over large areas of the SWMU. Please provide technical basis to support the two foot excavation limit or conduct a cost sensitivity analysis to address the potential for significant variations in soil/sediment excavation/ remediation quantities.

Navy Response:

Please see the response to EPA General Comment #3.

5. PREQB requests that receptors with potential future exposure be identified as "potential future receptors" rather than "hypothetical future receptors." PREQB understands that fishing/crabbing may occur at this site; therefore, future fish or crab consumers are not hypothetical (i.e., theoretical or conjectural), but current and potential future receptors. Trespassers also are current and potential future receptors, as it is highly unlikely that trespassing would not occur (i.e., highly unlikely to be hypothetical for future receptors). As recreational receptors are protective of trespassers (i.e., a trespassing exposure scenario is not evaluated separately), current and future recreational receptors are current and potential receptors rather than hypothetical. Note that this document also refers to potential/hypothetical receptors (i.e., Section 1.0, last paragraph) and current/future/hypothetical receptors (Figure 2-1). However, Section 1.3 of Appendix E, Post Removal Human Health Risk Assessment, does not use the term "hypothetical" and only discusses current and future receptors. Please clarify in the text the purpose for these two terms, why various combinations of these terms are used to describe various receptors and how all these terms or phrases differ in meaning.

Navy Response:

To be consistent with terminology used in EPA's guidance, such as Reuse Assessments: A Tool to Implement the Superfund Land Use Directive, "hypothetical" has been removed as a descriptor for receptors throughout the FS Report. However, it is recognized that there may be readers of the FS Report who may incorrectly assume there is a planned land use change if unrealistic receptors (e.g., residents) are referred to as "potential." Therefore, the second paragraph of Section 2.3 has been revised to read:

"Figure 2-1 presents a graphical representation of the CSM for SWMU 6. Although the CSM identifies multiple potential human and ecological receptors, the post-removal HHRA determined the only human receptors of concern at the site are potential consumers of edible-size fish and blue crab from the lagoon due to the presence of elevated PCBs in lagoon sediments, as discussed below. It should be noted that there are various types of receptor scenarios that were evaluated in the HHRA as "potential," but which are not planned or reasonably anticipated because the land is and will continue by law to be part of the Vieques National Wildlife Refuge. The land use at SWMU 6 is for preservation of wildlife, not uses such as

recreational fishing or industrial or residential development. However, these "potential" scenarios were evaluated in the HHRA as a conservative measure to determine if the site could be considered for unrestricted use. Here, "unrestricted use" is defined under CERCLA as not requiring remediation or controls to be protective of human health or the environment.

The post-removal ERA identified lead and zinc as the only ecological COCs, based on direct exposure to these metals in sediment by lower trophic level receptors."

Page-Specific Comments

1. Figure ES-3 and Figure 2-1:

   a. Please include the former PCB Removal Area on this figure.

      Navy Response:

      The former PCB Removal Area has been added on this Figure.

   b. Please include the vertical impacts from the former solid waste disposal area. Please include or add a figure showing a cross section that bisects at least a part of the SWMU.

      Navy Response:

      The vertical extent of contamination is unknown, as stated in Section 7.2.3. However, it should be noted that all of the alternatives (other than the no action alternative) would address the contaminated sediment regardless of its depth.

   c. Please include the former limits of solid waste disposal on the diagram or verify the limits of SMWU-6 correspond to the horizontal limits of the former solid waste disposal area.

      Navy Response:

      The historical limits of waste disposal and the area requiring further remediation are not the same. The waste was removed during the interim removal action and confirmatory data were collected for which human health and ecological risk assessments were performed. The results of the risk assessments were used to determine the additional area requiring remediation, which is already shown on the relevant figures.

2. Figures ES-7 and ES-8: The legend identifies remedial option components below the figure; however, these features do not appear on the figures. Please clarify.

   Navy Response:

   The aforementioned features on Figures ES-7 and ES-8 (as well as Figures 6-4 and 6-5) have been removed as they are not pertinent to the figures. The figures have been revised to show the estimated reduction in open water area, which correponds to the area with the contaminated sediment and cap.

3. Figure 1-1: Please clarify the purpose for including the dashed circle and polygon features on this figure.

   Navy Response:

   As shown on the legend, the dashed circle and polygon features are easement lines.

4. Section 2.3 Post-Removal Conceptual Site Model, Page 2-3: Human exposure to sediment will occur during fishing and crabbing activities. Please clarify how this is addressed in this section and in the human health risk assessment (HHRA).

Navy Response:

The following text was added after the second sentence in the second paragraph of Section 2.3 and after the last sentence in the last paragraph of Section 1.3 in Appendix E:

"Fish and blue crab consumers may have direct contact with sediment and surface water at SWMU 6, and these exposure pathways are quantified under a recreational user/trespasser/site visitor exposure scenario. The exposure frequency and duration assumed for potential recreational users/trespassers/site visitors can be used as conservative estimates for sediment and surface water exposures by potential fish or blue crab consumers. COCs were not identified for sediment or surface water since recreational users/trespassers/site visitors risk estimates for site-related chemicals did not exceed target levels."

The exposure pathways quantified in the HHRA for recreational users/trespassers/site visitors and fish/blue crab consumers are consistent with the Vieques Master HHRA protocol.

PREQB Evaluation of Response:

The Master HHRA protocol states "…Other site-specific populations, such as subsistence anglers/crabbers and fish/crab consumers, may also be included in the HHRA when appropriate..." The fish consumer receptor identified in the Master HHRA protocol is presented as a receptor who only is exposed to site contaminants via the ingestion of fish tissue. Since it has been determined that anglers/crabbers may be exposed to site contaminants via exposure to site media, a site-specific determination, please clarify why the angler/crabber receptor exposure is linked to the general receptor exposure scenarios identified in the Master HHRA protocol. Please also discuss the contribution to overall cancer risks and hazards associated with the angler/crabber being exposed to site media other than fish or crab tissue.

Navy Response to Evaluation:

The sediment exposure frequency and duration for a recreational user (104 days/year) is conservative for the potential exposure frequency and duration for an angler/crabber receptor. Rather than presenting separate (lower) intake estimates for sediment exposures by anglers/crabbers, the sediment risk estimates for recreational users can be used as a conservative risk estimate for anglers/crabbers. The conservative sediment and surface water risk estimates for other exposure media (i.e., sediment and surface water) for anglers/crabbers are very low in comparison to fish/crab risk estimates as indicated below:

- Surface water[1] – ELCR not calculated[2]; HI = 0.2 (adult), 0.2 (youth), 0.3 (child)
- Sediment – ELCRs = $3x10^{-6}$ (adult & youth) and $7x10^{-6}$ (child); HIs = 0.2 (adult), 0.3 (youth), and 0.7 (child)
- Fish[3] – ELCR = $2x10^{-4}$ (adult), $1x10^{-4}$ (youth), and $9x10^{-5}$ (child); HI = 7 (adult), 12 (youth), and 16 (child)
- Crab[3] – ELCR = $3x10^{-5}$ (adult) and $2x10^{-5}$ (youth and child); HI = 1 (adult and youth) and 2 (child)

The following revised text was added after the second sentence in the second paragraph of Section 2.3 and after the last sentence in the last paragraph of Section 1.3 in Appendix E:

"Fish and blue crab consumers may have direct contact with sediment and surface water at SWMU 6. The exposure frequency and duration assumed for potential recreational users/trespassers/site visitors can be used as conservative estimates for sediment and surface water exposures by potential fish or blue crab consumers. COCs were not identified for direct contact exposures to sediment or

[1] Not including thallium and hexavalent chromium, which are wholly or primarily attributable to background.

[2] Site-related COPCs are not potential carcinogens.

[3] Based on an exposure frequency of 1 meal/month.

surface water since recreational users/trespassers/site visitors risk estimates for site-related chemicals did not exceed trigger levels for these media."

PREQB Evaluation of Response to Evaluation:

For footnote 3, please refer to PREQB's Evaluation of Response to PREQB Comment 8 below.

Navy Response:

Please see the response to PREQB's Evaluation of the Response to PREQB Comment 8 below.

PREQB Evaluation of Response:

Please refer to PREQB's Evaluation of Response to PREQB Comment 8 below.

5. Table 2-1:
   a. Please shade the result for benzo(a)pyrene in sample VWW06-SD011 yellow since it is above the Adjusted RSL for Residential Soil.

      Navy Response:

      The table has been revised as requested.

   b. Please shade the results for selenium in samples VWW06-SO132 and VWW06-SO137 green since these results are above the background and soil ESV values.

      Navy Response:

      As noted in the footnote of the table, these samples were screened only against background and adjusted RSLs, not soil ESVs. Therefore, no shading is warranted. The footnote has been updated to read: "Samples screened only against Background and Adjusted RSL for Residential Soil because these samples were evaluated as sediment in the ERA because they occur within the interidal zone; thus, soil ESVs do not apply."

   c. Please shade the results for zinc in samples VWW06-SO132 and VWW06-SO142 green since these results are above the background and soil ESV values.

      Navy Response:

      Please see the response to Page-specific Comment #5b.

6. Figure 2-2:
   a. Please include the locations and sample identifiers for the samples presented in the text box.

      Navy Response:

      Based on the fish and crab collection techniques, the locations of the samples within the lagoon are unknown. However, the locations are not particularly relevant because the fish and crab move throughout the lagoon. The following footnote for the sample ID box has been added: "Maximum Site Blue Crab is the maximum value of four crabs VWW06-CRB01 through VWW06-CRB04 collected from the SWMU 6 lagoon; Maximum Site Fish is the maximum value of four fishes VWW06-FS01 through VWW06-FS04 collected from the SWMU 6 lagoon."

   b. For clarity, please define the yellow shading in the text box.

      Navy Response:

      The following note has been added to the figure defining the yellow highlight: "Exceeds the HHRA Screening Level (SL)."

c. Please add in the entire definition for the U qualifier.

Navy Response:

The full note for U qualifier has been shown as: "Nondetect or not detected at significantly greater than that in an associated blank."

7. Figure 2-3: Please highlight COC concentration exceedances on this figure consistent with Figure 2-2.

Navy Response:

Figure 2-3 has been revised to highlight COC concentration exceedances and a note has been added defining the highlight.

8. Page 3-1, Section 3.0: The last paragraph states "…based on observations made during the biota sampling event, it was apparent that an ingestion frequency of two meals per week was unrealistic for the site due to the very small population of edible-size fish and blue crab in the lagoon…" Since the aquatic environment is a recent feature at this site, please add text describing site characteristics that support the assumed lack of sufficient edible-sized fish and blue crab populations in the future. This comment also applies to Section 3.2. Note detailed discussion in Comment 6c below.

Navy Response:

The last sentence of the first paragraph in Section 3 was revised to state:

"However, based on observations made during the biota sampling event, it was apparent that an ingestion frequency of two meals per week was unrealistic for the site due to the very small population of edible-size fish and blue crab, as discussed in Section 3.2."

The last paragraph in Section 3.2 and in Section 3.2.2 of Appendix E was revised as follows:

"Evaluation of the fish and blue crab consumption pathways was conducted using an agency-approved site-specific ingestion frequency of two fish or blue crab meals per week. However, based on observations made during the biota sampling event when the areal extent of the shallow lagoon was readily accessed for fishing/crabbing over a 2-day period, it appears that the vast majority of edible size fish/blue crabs that were present in the lagoon were caught, primarily within the first day. Therefore, it became apparent that this ingestion frequency was overly conservative due to the very small number of edible-size fish and blue crab present in the lagoon (4 snook, 5 mullet, and 5 blue crab), and the physical nature of the lagoon. The area of open water in the SWMU 6 lagoon is small (0.6 acre), the water depth is shallow (approximately 1 foot average based on measurements made while wading across the areal extent of the lagoon), and the current hydrologic connection to the Kiani Lagoon complex is constricted (approximately 3 feet wide and 1 foot deep) and mostly filled by a dense growth of red mangrove prop roots. These roots create an effective, natural barrier to large fish, allowing only small, young fish or crab to pass into the SWMU 6 lagoon. Therefore, the lagoon does not support a large population of edible-size fish or blue crab. Upon entering the lagoon, a juvenile fish or crab would require an additional 6 to 12 months to reach an edible size. In the future, due to natural processes, the opening to the lagoon will likely become completely overgrown by mangrove roots and blocked by sedimentation, resulting in an even smaller population of edible-size fish and blue crab in the lagoon. Therefore, a more realistic site-specific ingestion frequency of one meal per month was evaluated and included in the uncertainty analysis of the HHRA."

PREQB Evaluation of Response:

Further justification appears warranted to support the one meal per month site-specific ingestion frequency for blue crab. Although large fish may be precluded from accessing the SWMU 6 lagoon by the mangrove roots and may only support a one meal per month ingestion frequency, large blue crab would still be able to access the SWMU 6 lagoon. Given that blue crabs may move several hundred feet per day

as they forage, it is not unreasonable to conclude that large blue crabs may enter and forage within the SWMU 6 lagoon, particularly if no large blue crabs are present due to recent crab harvesting which would reduce competition. The two days of observation conducted during the SWMU 6 fish/crab sampling do not support the conclusion that large blue crabs would not be present for 30 days post-crab harvesting as large blue crabs may have returned within one week post-sampling. Please use a more realistic site-specific ingestion frequency of one blue crab meal per week unless additional justification can be provided to support the one meal per month frequency.

Navy Response to Evaluation:

The constricted and heavily vegetated hydrologic connection between the SWMU 6 lagoon and the Laguna Kiani Complex is a significant, limiting barrier to the passage of edible-sized fish and blue crabs. It is not 100 percent effective in blocking movement of these organisms, but it is a strong deterrent, especially considering the readily accessible and extensive open water habitat available in the Laguna Kiani Complex outside of the SWMU 6 lagoon. Although blue crabs may forage over several hundred feet per day in open bottom habitats, the site-specific access restrictions at SWMU 6 would likely limit entry into the lagoon to an irregular occurrence. There are no significant food sources or other hydrologic conditions that would directly draw blue crabs into the SWMU 6 lagoon.

The biota sampling event demonstrated that the SWMU 6 lagoon, under undisturbed conditions, only supported a total of 5 crabs greater than 3 inches in carapace width. Total body weight of the individual crabs ranged from 86 to 124 grams, and averaged 109 grams. Considering a meal size of 227 grams, an adult would need to harvest a minimum of 3 average-sized blue crabs from the SWMU 6 lagoon to obtain a single meal. The Navy feels the observations made during the biota sampling are representative of the crab population reasonably expected to be present at any time because it represented the population that has developed over the several years prior to the biota sampling. Considering the significant hydrologic restrictions, recruitment could be reasonably estimated at one large crab per week; thus, it could take at least 3 to 4 weeks for a population of blue crabs to be available for harvest to complete a single meal size.

Recreational crabbers contemplating crabbing at the SWMU 6 lagoon would have adjacent and easy access to the waters of the Laguna Kiani Complex, either from shore, bridge, or boat. It is therefore reasonable to consider that most crabbers attempting to collect blue crabs from the SWMU 6 lagoon would quickly learn that the populations are limited (even after months of no harvest), and would move on to more likely productive areas including the adjacent Laguna Kiani Complex, or Laguna Punta Arenas located within several hundred feet of SWMU 6.

By comparison, blue crab sampling at the background lagoon (Laguna Punta Arenas) demonstrated a much larger population with larger-sized crabs available for recreational harvest. After two days of sampling, 12 blue crabs were retained for potential lab analysis, although many more were captured and released since sufficient numbers had already been collected. Total body weight of the individual crabs ranged from 88 to 225 grams, and averaged 153 grams. This sampling location did not have significant physical restrictions to the open waters of Laguna Punta Arenas, thus blue crabs could readily move in and repopulate the shoreline and bridge access areas after a harvest. This background comparison supports the contention that restrictive habitat conditions (i.e., small size, constricted hydrologic connection) at SWMU 6 limit the availability of blue crabs in the lagoon.

Therefore, the more realistic site-specific ingestion frequency of one blue crab meal per week is justified.

PREQB Evaluation of Response to Evaluation:

The response states that crab recruitment could be reasonably estimated at one large crab per week based on the limited crab access to the lagoon and the lack of significant food resources. It does not seem very likely that crabs are currently precluded (or even discouraged) or would be precluded from entering the lagoon in the future. Food resources are already present within this lagoon that support foraging crabs. Based on the understanding that the lagoon will continue to mature as aquatic habitat it is likely

that these food resources will also increase and may support a greater number of crabs in the future. Therefore, it could be reasonably estimated that (in the absence of competition from an existing population of large crabs within the lagoon) that three large crabs per week (rather than one) could be recruited in the SMWU 6 lagoon. Thus, it could take one week for a population of blue crabs to be available for harvest to complete a single meal size. Although it is likely that other nearby areas such as Laguna Kiani provide greater opportunities for harvesting crabs, the extremely easy access to the SWMU 6 lagoon may promote crabbing on a periodical basis based on the recruitment of new crabs into the lagoon. Without providing additional information to justify the use of a single crab meal per month, PREQB prefers that 1 meal per week be used in the human health risk assessment rather than 1 meal per month; however, PREQB will defer to USEPA on this issue.

Navy Response:

The HHRA RAGS D Tables 4.5, 4.6, 7.13-7.15, 9.13-9.15, and 10.13-10.15 presented in Appendix E of the Feasibility Study are based on a crab consumption rate of 2 meals per week. The uncertainty analysis section of the HHRA discusses the risk estimates associated with an ingestion frequency of 1 meal per month. Since intake and risk are directly related, the risk estimates associated with 1 meal per week are one-half the risk estimates presented in RAGS D Tables 9.13-9.15 for 2 meals per week. No further risk estimates are needed in the HHRA.

PREQB Evaluation of Response:

The report discusses an ingestion rate of 2 meals per week as being unrealistic for blue crabs. However, as PREQB has discussed above, an ingestion rate of 1 meal per week is considered realistic and is preferred. In addition, the crab ingestion rate of 1 meal per week is also included in the calculation of the PRGs; therefore, PREQB prefers that an ingestion rate for the blue crab of 1 meal per week is used in calculating the PRGs. However, PREQB will defer to EPA on this issue.

9. Page 3-2, Section 3.1:
   a. Please add text clarifying why gutted fish and whole body crab were sampled. This comment also applies to Section 2.1.3 of Appendix E (Human Health Risk Assessment).

      Navy Response:

      The following text was added after the second sentence in the fourth paragraph of Section 3.1 and after the second sentence in the first paragraph of Section 2.1.3 of Appendix E:

      "Gutted whole-body fish and whole-body crab were sampled to reflect local food preparation and cooking methods. As stated by representatives from EPA and PREQB on October 27, 2011, gutted whole-body fish and whole-body crab are occasionally used in stews and soups prepared by local residents."

   b. Trespassers and Site Visitors are listed as receptors in this section; however they are not shown on Figure 2-1, the Conceptual Site Model. Please clarify.

      Navy Response:

      Figure 2-1 has been revised. "/Trespassers/Site Visitors" was added to the end of "recreational users" in 2 places on revised Figure 2-1.

10. Page 3-5, Section 3.4:
    a. Thallium in Surface Water: The uncertainty factor associated with the RfD of 3000 is proposed as one line of evidence to support not identifying thallium as a chemical of concern (COC). The uncertainty in the toxicity of thallium may result in either overestimating or underestimating actual risks. Therefore, it is unclear that this is a line of evidence for eliminating thallium, as toxicity may also be higher than the available underlying studies indicate. Please remove this bullet as a line of evidence. This comment also

applies to Section 5.5.2 and Table 5.1 of Appendix E, where Table 5.1 needs to indicate May under- or over-estimate actual risks.

Navy Response:

The total uncertainty factor of 3000 was used as one line of evidence, but not the single line of evidence. Thallium was likely identified as a risk driver due to the conservative approach used by EPA when calculating toxicity values (i.e., the application of multiple uncertainty factors to the toxicity value to derive a protective RfD). The use of multiple uncertainty factors results in a "margin of safety" built into the RfD, and doses equal to or less than the RfD are expected to be without risk of adverse effects. The last bullet in the subsection "Thallium in Surface Water" in Section 3.4 and Section 5.5.2 in Appendix E was revised to state:

> "The total uncertainty factor associated with the oral RfD is 3000 (10 for interspecies extrapolation, 10 for intraspecies extrapolation, 3 for extrapolation from a subchronic to chronic study, and 10 for database deficiencies). Due to the use of multiple uncertainty factors, the RfD for thallium likely results in a conservative estimate of potential non-carcinogenic hazards."

No changes are needed to Table 5-1 because the application of multiple uncertainty factors to the thallium RfD is unlikely to result an underestimate of actual risk.

b. 4,4'-DDD and 4,4'-DDE in Fish and/or Blue Crab: This paragraph states "…there is no known historical use of SWMU 6 for pesticide disposal…" As SWMU 4 was an uncontrolled dump site, records were not kept for any hazardous substance released at the site (i.e., there is no know historical use of SWMU 6 for the disposal of lead-containing items such as batteries, yet lead is identified as a COC). Therefore, please remove this rationale as a factor in not identifying 4,4'-DDD and 4,4'-DDE as COCs in fish and/or blue crab.

Navy Response:

The second to last sentence in the subsection "4,4'-DDD and 4,4'-DDE in Fish and/or Blue Crab," in Section 3.4 and in Section 5.5.3 of Appendix E was removed.

c. Lead in Blue Crab: This section states "…An exposure frequency of 1 meal/month is considered more representative of site conditions and a more realistic, sustainable ingestion rate for the lagoon…" Please provide the calculations used to support an 8.6-fold reduction in the ingestion rate. Please include a discussion regarding the estimated number of blue crabs likely to inhabit SWMU 6 based on the available habitat and life history for blue crab. Also, discuss the expected timeframe for immigration of blue crabs from the immediate vicinity to replace routinely harvested crabs was determined. This comment also applies to Sections 3.2.2 and 5.5.4 of Appendix E. Note that Section 5.5.4 of Appendix E also indicates that it was determined that 1 meal per month is a more realistic, sustainable ingestion rate.

Navy Response:

Please see the response to Page-specific Comment #8. In addition, if recreational fishers/crabbers attempted to fish/crab at the SWMU 6 lagoon more than once a month, they would likely be unsuccessful in catching fish/crab and go elsewhere. At the boundary of SMWU 6, a bridge and boat ramp are readily accessible, providing direct access to Kiani Lagoon for both boat and shore fishing. Kiani Lagoon is a larger water body that supports more and larger fish, providing more opportunities for repeated successful fishing.

The 2nd sentence of the Lead in Blue Crab subsection of Section 3.4 was replaced with the following:

> "As previously discussed in Section 3.3, an ingestion frequency of 2 meals per week was considered to be overly conservative due to the very small number of edible-size fish and blue crab in the lagoon and the physical nature of the lagoon. Additionally, if fish or blue crab consumers attempted to fish or crab at the SWMU 6 lagoon more than once a month, they would likely be unsuccessful in catching fish or crab and go elsewhere, such as adjacent Kiani Lagoon.

Kiani Lagoon is a larger water body that supports more and larger fish, providing more opportunities for repeated successful fishing."

The following text was added to Section 5.5.4 of Appendix E:

"As previously discussed in Section 3.2.2, an ingestion frequency of 2 meals per week was considered to be overly conservative due to the very small number of edible-size fish and blue crab in the lagoon and the physical nature of the lagoon. Additionally, if fish or blue crab consumers attempted to fish or crab at the SWMU 6 lagoon more than once a month, they would likely be unsuccessful in catching fish or crab and go elsewhere, such as adjacent Kiani Lagoon. Kiani Lagoon is a larger water body that supports more and larger fish, providing more opportunities for repeated successful fishing."

The risk calculations (i.e., RAGS Part D Table 7) for 1 meal/month have been added to Attachment E-6 and reference to Attachment E-6 has been added to Section 5.6.2. Additionally, a footnote has been added to these tables indicating that they present risk estimates for an exposure frequency of 1 meal/month.

PREQB Evaluation of Response:

Please refer to PREQB's Evaluation of Response to Page-Specific Comment 8.

Navy Response to Evaluation:

Please refer to the Navy's response to PREQB's Evaluation of Response to Page-Specific Comment 8.

PREQB Evaluation of Response to Evaluation:

Please refer to PREQB's Response to Evaluation Response to Page-Specific Comment 8.

Navy Response:

Please see the response to PREQB's Evaluation of the Response to PREQB Comment 8 above.

PREQB Evaluation of Response:

Please refer to PREQB's Response to Evaluation Response to Page-Specific Comment 8.

11. Page 4-4, Section 4.4.1: The report states that the lagoon sediment samples contain lower total organic carbon (TOC) than the samples collected from the Laguna Kiani complex lobe just outside the lagoon. The TOC data presented in Appendix A confirm that TOC levels in sediments from the Laguna Kiani complex lobe are approximately twice the TOC levels noted in the lagoon sediment. Therefore, the mean lagoon sediment TOC concentration should be used in evaluating risk to ecological receptors using the lagoon and the TOC results from sediment samples collected from the Laguna Kiani complex lobe should be used in evaluating Laguna Kiani sediments only. Please use this TOC value in evaluating risk to higher trophic level receptors.

Navy Response:

As recommended, TOC data from samples within the SWMU 6 lagoon and the Laguna Kiani complex lobe have been evaluated separately in the ecological risk assessment (ERA) (Appendix F). No changes were necessary in the Section 4.4.1 text; however, the following changes were made in Appendix F:

In Table F-2, average values for TOC and other physical parameters are presented separately for the SWMU 6 lagoon and the offsite Laguna Kiani complex lobe.

In Tables F-8 and F-10, the TOC value of 1.94 percent was changed to 1.43 percent and the associated BAFs for fish and invertebrates recalculated. The adjusted (slightly increased) BAFs were subsequently updated in the aquatic food web exposure calculations for the SWMU 6 Lagoon (Tables F-26, F-27, and F-28). As a result of the updated food web modeling, the following sentence has been added at the end of the first paragraph in Section 1.5.2.4 (Food Web Exposure), Appendix F:

"There was also one exceedance (for Aroclor-1254) for the fishing bat."

In Tables F-25 and F-31, TOC concentrations were updated for the calculation of sediment EqP values for the SWMU 6 lagoon and Laguna Kiani complex lobe, respectively.

Other text revisions associated with the adjustments in TOC are described in Appendix F Specific Comments #2 and #3. Revisions in TOC values did not result in any changes to the ERA conclusions.

12. Page 4-4, Section 4.4.1: A comparison of the detected concentrations of 2-butanone and carbon disulfide in lagoon sediment samples with their corresponding freshwater EqP values was conducted. It is suggested that this comparison use the sample-specific TOC value in calculating the EqP values for the maximum concentrations.

Navy Response:

Per the ERA protocol (Section 1.2.2.2), site-specific (versus sample-specific) TOC is to be used for calculation of EqP values. The SWMU 6 ERA currently includes EqP values calculated using site-specific TOC for several other parameters (e.g., acetone, multiple pesticides), thus using sample-specific TOC for 2-butanone and carbon disulfide would be inconsistent. Therefore, site-specific TOC calculations of EqP will be maintained in this ERA.

13. Page 4-4, Section 4.4.1: The report indicates that the results of the crab and fish sampling conducted within the SWMU 6 lagoon were evaluated for the aquatic food web models and this evaluation did not result in any changes to the risk assessment conclusions. Additional discussion should be provided in the text regarding this analysis (e.g., HQs associated with NOAEL, MATC and LOAEL TRVs for each of the receptor species). Although the tissue samples are not directly comparable to the food items ingested by the receptors (tissue samples were collected from organisms that are generally larger than ingested by the receptors as stated earlier in the report), the detected concentrations are likely to be more representative of actual exposure (yet conservative as larger crabs and fish were sampled that presumably contain higher contaminant concentrations than smaller crabs/ fish) than the modeled concentrations within their diets. This should be reflected in the text along with the HQ results.

Navy Response:

Note that the details of the crab and fish tissue evaluation in the aquatic food web models are provided in Appendix F, Attachment D. The following paragraph has replaced the eighth paragraph in Section 4.4.1 to provide additional summary results:

"In addition, mean concentrations of the metals (lead and zinc) and PCBs detected in blue crab and fish (mullet and snook) tissue samples collected for evaluation of potential human exposures were entered into the aquatic food web models (see Appendix F, Attachment D). Food web receptors included the spotted sandpiper, green heron, and fishing bat, all of which normally consume small prey items such as polychaetes, fiddler crabs, and small fish (< 3 inches). The analyzed organisms, which included whole body crabs (average 4 inch carapace width) and whole body (gutted) fish (average 11 inches total length), do not represent typical prey items for these wildlife receptors primarily because of their large sizes. Considering this uncertainty, site specific tissue data can be more representative of actual exposure relative to modeled dietary concentrations. The same aquatic food web models used in the ERA (Appendix F) were used for this tissue evaluation except that mean blue crab concentrations were substituted for modeled mean benthic invertebrate concentrations and mean fish concentrations (both species combined) were substituted for modeled fish concentrations.

Results of the food web models indicated only lead had an MATC-based HQ that exceeded one (HQ=1.03) for the spotted sandpiper, the defined threshold for a potential adverse effect in the final ERA protocol, although the HQ based upon the LOAEL was less than one for lead. For the spotted sandpiper, lead exposure at the site is unlikely to result in unacceptable risk given the low magnitude of the risk estimate.

For the green heron, HQs based on NOAEL, MATC, and LOAEL TRVs were all less than one. The fishing bat had a NOAEL-based HQ of 1.9 for dioxin-like PCBs (TEQ), but MATC and LOAEL-based HQs were less than one; HQs for all other parameters were less than one. This additional evaluation of tissue data collected to support potential HHRA exposure scenarios did not result in any changes to the above conclusions of the ERA."

14. Page 4-5, Section 4.4.2: A comparison of the detected concentrations of 2-butanone and carbon disulfide in the Laguna Kiani complex lobe sediment samples with their corresponding freshwater EqP values was conducted. It is suggested that this comparison use the sample-specific TOC in calculating the EqP values for the maximum concentrations.

Navy Response:

Please see the response to Page-specific Comment #12.

15. Page 5-2, Section 5.3: Please clarify that both dioxin-like and nondioxin-like PCBs were identified as COCs. This information is needed as these two groups have different toxicities, as further discussed in comments on Section 5.4 below.

Navy Response:

The first bullet in Section 5.3 was revised to state: "HHRA: Dioxin-like PCBs and non-dioxin-like PCBs in edible-size fish/blue crab"

16. Page 5-2, Section 5.4 and Table 5-2:
    a. Step 1:
        i. Please provide a reference in the text to Table 5-2.

Navy Response:

A reference to Table 5-2 was added in the last sentence of the first bullet in Section 5.4.

        ii. Please discuss the uncertainty associated with using the median rather than the average or maximum fish BSAF for PCBs in the Uncertainty Section of the human health risk assessment. Note that the median value appears to be 0.37 rather than 0.36. Please verify.

Navy Response:

The following text was added to the uncertainty section (Section 5.6.3) of the HHRA (Appendix E):

"As discussed in Section 5.4 of the FS, a sediment preliminary remediation goal (PRG) was calculated for PCBs for the protection of human health at SWMU 6. Consistent with standard approaches for calculating BSAFs, the maximum calculated BSAF was not used to represent the site (EPA, 2006). Rather, the median fish BSAF was selected to best represent the environmental setting over the exposure duration, to avoid one outlier PCB concentration in one fish sample (VWW06-FS03-0212) from dominating the BSAF, and because it was higher than the median crab BSAF. The final sediment PRG for total non-dioxin-like PCBs using the median BSAF was 0.2 mg/kg. The PRG based on the maximum BSAF of 4.01 was 0.02 mg/kg and the PRG based on the average BSAF of 1.23 was 0.1 mg/kg. The PRGs calculated using the median and average BSAFs are similar; however, the PRG calculated using the maximum BSAF is an order of magnitude lower than the PRG calculated using the median BSAF. A receptor is unlikely to be exposed to the maximum BSAF observed in this one fish sample over a chronic exposure duration. The PRG derived using the median BSAF provides a better representation

of the longer-term environmental setting at the SWMU 6 lagoon and the actual exposures likely to occur through fish and crab consumption under a chronic duration."

(Reference: EPA 2006. Estimation of Biota Sediment Accumulation Factor (BSAF) From Paired Observations of Chemical Concentrations in Biota and Sediment. EPA/600/R-06/047. May.)

The median BSAF is 0.37 and has been updated in Table 5-2.

iii. Describe mathematical basis for the analysis that discounts the extremely high concentration of PCB in one fish sample (FS03-0212) and why this approach is consistent with a limited data set.

Navy Response:

Please see the response to Page-specific Comment 16.a.ii.

b. Step 2: Both dioxin-like and nondioxin-like PCBs were identified as COCs in biota tissue. Dioxin-like PCBs have a different mode of action than nondioxin-like PCBs and are more toxic than the nondioxin-like PCBs. Therefore, please calculate PRGs separately, where the high-risk PCB toxicity criteria may be used for developing the nondioxin-like PCB PRG, and the 2,3,7,8-TCDD toxicity criteria is used to calculate the dioxin-like PCB PRG, consistent with the approach taken in HHRA for quantifying risks associated with exposure to PCBs.

Navy Response:

Sediment PRGs for PCBs are typically based on "total PCBs" from Aroclors rather than dioxin-like PCBs. Basing PRGs on dioxin-like PCBs would result in a PRG of approximately 2x10-6 mg/kg, which is out of line with accepted PRGS for other sediment remediation sites in EPA Region 2 (see below). As part of the remedial action, a PRG of 2x10-6 mg/kg would be impractical to assess because it is significantly below standard laboratory detection limits (i.e., around 16 □g/kg based on recent sediment data). Also, the Feasibility Study would need to be changed significantly to evaluate the cost and practicability of reaching such a low PRG. For example, the dredging alternative would require repeated efforts to remove dredge residuals in excess of the PRG. This would significantly increase cost, and it is doubtful that the PRG would ever be met by dredging. For these reasons, the Navy proposes not to use dioxin-like PCBs to calculate PRGs at SWMU 6. Details are provided below.

Draft sediment PRGs were calculated for dioxin-like and non-dioxin-like PCBs using the following steps:

- *Step 1* - Empirical biota-sediment accumulation factors (BSAFs) were calculated for each fish and blue crab sample using measured dioxin-like and non-dioxin-like PCB congener concentrations in fish and assumed dioxin-like and non-dioxin-like PCB congener concentrations in sediment based on average Aroclor-1254 concentrations **(Exhibits 1 and 2)**. The assumed distribution of the 12 dioxin-like congeners for Aroclor-1254 in sediment (the only Aroclor detected in sediment samples) was obtained from Martinez Araneda (2010) and used to calculate the total fraction of dioxin-like PCBs in Aroclor-1254 in sediments. Based on the values estimated by Martinez Araneda, 8.86% of Aroclor-1254 in sediment consists of dioxin-like PCBs (**Exhibit 1 Supplement**). Non-dioxin-like PCBs were assumed to comprise 91.14 percent (100 percent minus 8.86 percent) of the average Aroclor-1254 concentrations in sediment. The median fish BSAFs were selected as the BSAFs to use in the PRG calculations because they best represent the environmental setting over the exposure duration, they keep one outlier PCB concentration in one fish sample (VWW06-FS03-0212) from dominating the BSAFs, and they are higher than the median crab BSAFs.
- (Reference: Martinez Araneda 2010. Andres Jose Martinez Araneda. "*Release of polychlorinated biphenyl congeners in a contaminated harbor and canal*." dissertation, University of Iowa. http://ir.uiowa.edu/etd/707.)
- *Step 2* – Intermediate fish tissue PRGs were calculated for adult, youth, and child consumers based on the exposure assumptions used in the HHRA (**Exhibits 1 and 2**), with the exception that

a more realistic consumption frequency of 1 meal/month was used for the draft PRG calculations because of the scarcity of edible-size fish and blue crabs in the lagoon, as observed during the biota sampling event in January/February 2012. Four sets of fish PRGs were calculated for dioxin-like and non-dioxin-like PCBs based on a target ELCR of 10^{-4}, 10^{-5}, 10^{-6}, and target HQ of 1. The lowest ELCR-based fish PRGs were for adult consumers, and the lowest non-cancer-based fish PRGs were for child consumers (**Exhibits 1 and 2**).

- *Step 3* – Draft sediment PRGs for dioxin-like and non-dioxin-like PCBs were calculated based on the lower of the cancer-based PRG (target risk of 10^{-4}) and non-cancer-based PRG (target HQ of 1). The draft sediment PRGs for dioxin-like PCBs ($2x10^{-6}$ mg/kg) and non-dioxin-like PCBs (0.1 mg/kg) are presented in **Exhibits 1 and 2**, respectively, and are summarized in **Exhibit 3.**

As demonstrated by these calculations, incorporating dioxin-like PCBs into the sediment PRG would result in a risk-based PRG of 2x10-6 mg/kg. The calculated PRG incorporating dioxin-like PCBs is far below the proposed sediment PRG of 0.2 mg/kg for Aroclor-1254, is technically impractical, and inconsistent with PRGs for other sediment remediation sites (which are typically based on "total PCBs").

The following text was added after the 3rd bullet of Section 5.4:

"The toxicity of dioxin-like PCBs was not incorporated into the sediment PRG. If the sediment PRG considered dioxin-like PCBs, the resulting risk-based PRG would be approximately $2x10^{-6}$ mg/kg, which is far below the proposed sediment PRG of 0.2 mg/kg for Aroclor-1254, is technically impractical to achieve, and is inconsistent with PRGs for other sediment remediation sites (which are typically based on "total PCBs")."

Please note that a Record of Decision search for Superfund Sites in USEPA Region 2 indicated the following final PCB cleanup levels for sediment:

- General Motors (Central Foundry Division) – 1 ppm PCBs for sediment in St. Lawrence and Raquette Rivers, based on fish consumption and interim federal and state sediment quality criteria guidance.
- Kentucky Avenue Well Field – 1 ppm PCB (total) in Koppers Pond based on fish consumption and direct contact with sediment, consistent with EPA and state guidance for PCB cleanup levels in residential areas.
- Kin-Buc Landfill – 5 ppm PCBs in wetlands sediments based on fish consumption and bioaccumulation in aquatic species.
- Pollution Abatement Services – 1 ppm PCBs in White Creek and adjacent wetlands based on exposure of fish and wildlife.
- Reynolds Metals Co. – 1 ppm PCBs based on fish consumption by local residents

PREQB Evaluation of Response:

The Navy's calculation of a PRG for dioxin-like PCBs calculates a 2,3,7,8-TCDD PRG without the converting this PRG into individual PCB congener PRGs using the appropriate TEFs. The exclusion of this step results in a proposed PRG for dioxin-like PCB congeners that is orders of magnitude lower than required to meet acceptable risks and hazards. PREQB originally requested that the Navy demonstrate that the proposed total PCB PRG of 0.2 mg/kg is protective of exposures to the dioxin-like PCB congeners, which comprise a portion of total PCBs. PREQB has conducted this analysis, which shows that the proposed PRG of 0.2 mg/kg for total PCBs results in cancer risks and hazards for the dioxin-like PCB congeners below acceptable levels. This analysis is provided in the "PREQB calcs" spreadsheet included as an additional spreadsheet to the Navy's Exhibits file. Please revise the calculation of a PRG for dioxin-like PCBs to account for the differing toxicities for each congener as compared to 2,3,7,8-TCDD or alternatively, as requested by PREQB, please

include the demonstration that the proposed total PCB PRG is protective of exposures to dioxin-like PCBs in the FS.

Navy Response to Evaluation:

The original comment requested that the Navy calculate a separate PRG for non-dioxin-like PCBs and dioxin-like PCBs. Those calculations were provided in the initial Navy response.

Congener-specific PCB data are not available for site sediments. At the verbal request of PREQB during the August 2012 Vieques Technical Subcommittee meeting, the PCB congener profile available from the open literature for another site (Martinez Araneda, 2010) was used to identify the potential distribution of dioxin-like congeners in Aroclor 1254 (i.e., the Aroclor present in SWMU 6 sediment) and assess whether dioxin-like PCBs may be a significant percentage of the measured Aroclor 1254 concentrations in SWMU 6 sediment. As indicated in the Navy response, based on Martinez Araneda (2010), dioxin-like PCBs could be 8.86% of the measured Aroclor 1254 in SMWU 6 sediments, and could be a significant risk contributor.

The specific Aroclor 1254 congener distribution from the site studied by Martinez Araneda (2010; Indiana Harbor and Ship Canal in East Chicago, Indiana), which is a highly contaminated 100-year old, 7-km long, industrial harbor (maximum of 35 ppm total PCBs), is not applicable for making cleanup decisions at the SWMU 6 lagoon, which has low sediment contamination (maximum of 0.26 ppm Aroclor 1254) and is a 3-year old, small, man-made water body. Use of the congener distribution data from the literature site to calculate site-specific congener-based dioxin-like PCB PRGs for SMWU 6 sediments is not an appropriate or defensible approach due to the large uncertainty in this type of extrapolation from an unrelated site more than 1,000 miles from SWMU 6. Therefore, the Navy proposes to retain the recommended PRG of 0.2 ppm for total PCBs in sediment.

PREQB Evaluation of Response to Evaluation:

As discussed in our evaluation of the Navy's response, there is an error in the calculation of the dioxin-like PCB PRG presented in the Navy's response. TEFs for the PCB congeners were not applied to the 2,3 7,8-TCDD PRG calculated, resulting in a PRG that is orders of magnitude lower than needed to meet acceptable risk levels. PREQB provided revised calculations demonstrating that the Navy's proposed total PCB PRG of 0.2 mg/kg is protective of exposures to dioxin-like PCBs. PREQB believes that the proposed total PCB PRG is protective; however, PREQB prefers that the appropriate supporting documentation demonstrating that this PRG is protective of exposures to dioxin-like PCBs is presented in the report, since dioxin-like PCBs were identified as being above acceptable risk levels. Please correct the calculations to convert the 2,3,7,8-TCDD PRG to dioxin-like PCB PRGs using the appropriate PCB TEFs.

Navy Response:

There is no error in the Navy's dioxin-like PRG calculation; the PRG for dioxin was presented appropriately. There may be a high degree of variability between the literature site and the SWMU 6 lagoon due to site-specific physical and chemical characteristics, and it is not technically justifiable to assume that the congener ratios measured at the literature site are the same at SWMU 6. Therefore, the congener ratios from the literature site were not used in the PRG calculation. It should be noted that the Navy's proposed PRG (0.2 ppm) is five times more conservative than the typical PCB sediment cleanup level in Region 2.

PREQB Evaluation of Response:

The response states that "the PRG for dioxin was presented appropriately." PREQB agrees that there is no error in the calculation of a dioxin PRG. However, 2,3,7,8-TCDD is not a COC at this site. PRGs for the dioxin-like PCB congeners need to be calculated using toxicity criteria for each PCB congener rather than using the toxicity criteria for 2,3,7,8-TCDD. Note that dioxin-like PCBs

are orders of magnitude less toxic than 2,3,7,8-TCDD. Please also note PREQB's Evaluation of the Navy response to PREQB Comment 8. PREQB's concern is that the report indicates that cleanup is technically impractical for dioxin-like PCBs, since the dioxin-like PCB PRG is so low at 2E-06 mg/kg. However, as stated above, the PRG calculated is for 2,3,7,8-TCDD. A PRG for the PCB congeners identified at the site using the correct toxicity criteria would be several orders of magnitude higher than the dioxin PRG. PREQB's intent with this comment is for the report to present the PRG for the PCB congeners and to evaluate the remedial options using this PRG, not the PRG for 2,3,7,8-TCDD. However, PREQB will defer to USEPA Region 2 as to whether the region requires that the 2,3,7,8-TCDD PRG be used as the PRG for the significantly less toxic dioxin-like PCB congeners detected at this site.

Navy Response to Evaluation:

It is acknowledged that congener-specific dioxin-like PCB PRGs are not presented in the FS. Dioxin-like PCB data are available for site fish/crab, not sediment, and the correlation of dioxin-like PCB concentrations between site fish/crab and site sediment cannot be extrapolated based on literature data. Therefore, congener-specific dioxin-like PCB PRGs for site sediment were not calculated based on measured dioxin-like PCB concentrations in site fish/crab. Alternatives 2, 4, and 5 presented in the FS include long-term monitoring of sediment for Aroclors, not dioxin-like PCBs, and therefore PRGs for dioxin-like PCBs are not needed. The following revised text was added after the 3rd bullet of Section 5.4:

"The toxicity of dioxin-like PCBs was not incorporated into the sediment PRG. Sediment PRGs below the proposed sediment PRG of 0.2 mg/kg for Aroclor 1254 would be technically impractical to achieve, and would be inconsistent with PRGs for other sediment remediation sites (which are typically based on "total PCBs")."

c. The report states that cadmium, copper, lead and zinc were identified as COCs in the lagoon sediment for exposure by lower trophic level receptors (benthic organisms) primarily due to comparisons to very conservative ER-L values. ER-M values are subsequently selected as appropriate PRGs for these metals (only lead and zinc concentrations exceed their respective ER-M values). Please provide additional justification relative to the selection of ER-M values as appropriate PRGs for benthic organisms as SEM/AVS analyses of the sediment indicates that all four metals are likely to be bioavailable to benthic organisms. ER-L and ER-M values provide a dataset that includes bulk sediment concentrations but doesn't distinguish between those sediment results that are bioavailable or non-bioavailable (other than some sediment concentrations result in toxicity and other do not cause toxicity). It is conceivable that ER-L values may result in adverse effects to the benthic community if metals are bioavailable as they apparently are at the SWMU 6 lagoon. Although the report notes that ER-M values are often used as remediation criteria at CERCLA sites, it should be noted that site-specific PRGs are often developed based on the results of site-specific data (e.g., sediment toxicity testing). The need for additional data such as sediment toxicity testing to further evaluate the toxicity of the sediment metal concentrations (either prior to selection of the remedy or during Year 1 of any proposed monitoring program) should be considered. In addition, in lieu of establishing site-specific PRGs, consideration should be considered for more protective PRGs such as ER-Ls given the bioavailability of metals within the lagoon sediments.

Navy Response:

Development of site-specific PRGs (or a conclusion of no unacceptable risks) for the protection of benthic organisms would require laboratory toxicity testing of SWMU 6 lagoon sediment and/or quantitative biological surveys. These additional studies would not be appropriate considering that the evidence suggests sediment conditions have not yet reached post-removal equilibrium. As noted in the report, SEM/AVS ratios in nearly all SWMU 6 lagoon sediment samples exceeded one, suggesting that these metals are currently bioavailable. However, SEM/AVS ratios in the undisturbed sediment of the adjacent, offsite Laguna Kiani lobe complex were much less than one. As sediment conditions stabilize in the SWMU 6 lagoon, which includes the natural accumulation of total organic

carbon and increased sulfides, SEM/AVS ratios are expected to approach those of the Laguna Kiani lobe complex.

The use of ER-Ls as PRGs for cadmium, copper, lead and zinc, which are the same values used for the initial conservative screening in the ERA, would be overly conservative considering the stabilizing site sediment conditions, which includes reduced metal bioavailability over time. ER-M values, which represent the 50th percentile of the ranked effects data used to develop the ER-L, were selected to identify sediment PRGs for the site because of the level of conservatism of the ER-L, the ecological RAO (i.e., ensure the benthic community [if maintained] is not impaired [relative to background] by site-related contaminants such that the impairment would adversely affect upper-trophic-level populations that rely on it as a food source), and the past use of ER-M values as remediation criteria at other CERCLA sites. Examples of past use of ER-Ms as PRGs are attached, and include EPA issued RODs for Norfolk Naval Base (Sewells Point Naval Complex), and Jacks Creek/Sitkin Smelting and Refining site. In each example, the ER-M for lead (the value current at the time the ROD was issued) was selected as the sediment PRG.

In Section 5.4, the last paragraph has been updated as follows (see underlined text):

"For the protection of the benthic community at SWMU 6 (if maintained), the performance goal will be the establishment of a benthic community structure that can sufficiently support the upper-trophic-level fish and wildlife populations likely found in uncontaminated lagoon systems similar to SWMU 6. The ERA identified cadmium, copper, lead, and zinc as sediment COCs (for direct exposures of benthic invertebrate receptors) based largely on a comparison to very conservative ecological screening values, which for these four metals are based on Effects Range-Low (ER-L) values from the literature (Long et. al., 1995). ER-L values represent the 10th percentile of ranked effects data from a set of toxicity/field studies reported in the literature (mostly from the U.S. mainland). A measure of the site-specific bioavailability of these metals (i.e., simultaneously extracted metals/acid volatile sulfides [SEM/AVS]) was considered in the ERA and indicated the SEM/AVS ratios in nearly all SWMU 6 lagoon sediment samples exceeded one (mean of 12.6), suggesting that these metals are currently bioavailable. However, SEM/AVS ratios in the undisturbed sediment of the adjacent, offsite Laguna Kiani lobe complex were much less than one (mean of 0.06), which is a strong indication of what SWMU 6 sediments would also attain when equilibrium is reached following the interim removal action. As post-interim-removal-action sediment conditions stabilize in the SWMU 6 lagoon, including the natural accumulation of total organic carbon and increased sulfides, SEM/AVS ratios are expected approach those of the Laguna Kiani lobe complex and therefore restrict the bioavailability of cadmium, copper, lead, and zinc in the future. Considering the current and potential future (assuming undisturbed) site-specific conditions, Effects Range-Median (ER-M) values, which represent the 50th percentile of the ranked effects data used to develop the ER-L, were selected to identify sediment PRGs for the site because of: (1) the level of conservatism of the ER-L, (2) the ecological RAO, and (3) the past use of ER-M values as remediation criteria at other CERCLA sites. The ER-Ms for cadmium (9.6 mg/kg) and copper (270 mg/kg) are greater than the maximum detected concentrations in SWMU 6 lagoon sediment; therefore, remedial action (and therefore PRGs) for cadmium and copper is not necessary. PRGs for the remaining metals, based on ER-M values, are as follows:

- Lead = 218 mg/kg
- Zinc = 410 mg/kg"

PREQB Evaluation of Response:

The response is acceptable. However, please confirm that AVS/SEM will be analyzed in future monitoring events within the SWMU 6 lagoon. The FS indicated that PCBs, lead, zinc and

"sediment geochemistry" will be analyzed in the monitoring of sediment. AVS/SEM need to be specifically listed in the analyses of future sediment samples.

Navy Response to Evaluation:

It is premature to emphatically state at the FS stage the parameters that will be included in long-term monitoring, since the monitoring utimately implemented will depend on a number of factors, including regulatory agency review and approval of the long-term monitoring plan. The parameters included in the FS are for cost-estimating purposes. However, based on the above information, AVS/SEM would likely be included as an analytical parameter for Alternatives 2, 4, and 5 where sediment samples are proposed for lead and zinc.

17. Section 5.6.1 Description of Technologies, Page 5-4: Please provide additional information on depositional rates for sediment accumulation in the relatively low energy lagoon area. Compare likely depositional rates and validate that this MNA mechanism is appropriate for assessment over a 5-year review period.

Navy Response:

Please see the responses to EPA General Comment #2 and EPA Specific Comment #4.

PREQB Evaluation of Response:

Sediment depositional rates will affect the effectiveness and timeliness of achieving remedial action objectives for contaminated sediment in SWMU 6. Should this alternative be selected, quantification of sediment depositional rates and monitoring the stability of the deposited sediment will be critical in evaluating the performance of this alternative. Please ensure that the long term monitoring plan include monitoring of the depositional rate as well as the stability of accumulated natural sediment cover should this alternative be selected and that contingency measures be specified if risk is not reduced to acceptable levels within five years.

Navy Response to Evaluation:

Comment noted.

18. Table 5-3: This table indicates the removal of contaminants from sediment through plant uptake may not be effective for all COCs. Indicate this condition on Table 7-1 for MNA approaches under Overall Protection of Human Health and the Environment.

Navy Response:

Table 7-1 has been revised as requested.

19. Page 6-1, Section 6.2 Alternative 2 – Monitored Natural Recovery and Land Use Controls: Provide conceptual basis to justify the collection of five samples over the approximately 0.6 acre (26,000 sq ft) area (1 sample per 5,000 square feet) is appropriate to monitor natural recovery and represents an accurate assessment of current and future conditions.

Navy Response:

The number of samples is conceptual and subjective, but appropriate for FS cost estimating purposes. Varying the number of samples would not substantially alter the alternative cost or affect the overall ranking. This information has been added after the second sentence of the second bullet in Section 6.2.

20. Page 7-3, Section 7.2.1 Criteria Assessment of Alternative 1, Page 7-4: As the no action alternative is intended to imply no action, remove the statement that sediment monitoring may be required in the future or include the cost of this monitoring in the overall alternative analysis.

Navy Response:

The last two sentences of the fifth paragraph in Section 7.2.1 have been deleted.

21. Page 7-4, Section 7.2.2: The report states that Alternative 2 would likely reduce residual risks to acceptable levels due to natural processes within several years. Please provide additional justification (e.g., specific biological, chemical and physical processes) to support this statement as it is uncertain that concentrations of PCBs and metals within the top six inches of sediment would decline significantly within several years.

Navy Response:

Please see the response to EPA General Comment #2.

22. Page 7-7, Section 7.2.6: The report states that Alternative 6 (placement of 3 feet of soil over the lagoon) would meet all federal location-specific ARARs. It should be noted that this would include developing and implementing a wetlands mitigation plan to compensate for the wetland/waters filled by this alternative.

Navy Response:

Please see the response to EPA General Comment #8.

Appendix A, Post-Removal Surface Soil, Sediment and Surface Water Data Tables

1. Surface Water Analytical Summary Table: The results for total and dissolved metals show that significant dilutions were performed by the laboratory as the limits of detection (LODs) are significantly higher than those presented in the 2010 SAP. In addition, the nondetect results for the majority of the metals (antimony, arsenic, cadmium, chromium, cobalt, copper, lead, nickel, selenium, silver, thallium, vanadium and zinc) are above the screening criteria. PREQB questioned this during the preparation of the 2010 SAP due to the known presence of saltwater interference and requested the use of special extraction/analytical techniques to minimize this interference. However, the Navy specified that dilutions of 20-fold are not uncommon in this environment and felt that this dilution combined with the use of SW-846 method 6020A would generate useful data. It appears that dilutions much greater than 20-fold were performed based on the reported LODs.

   a. Please clarify how these data can be usable for decision-making purposes with so many screening criteria exceedances of contaminants of concern. In addition, based on table 1 in Appendix D, the screening criteria exceedance affected all or the majority of samples in many instances.

   Navy Response:

   Each sample required multiple dilutions in order to get the various analyte detections within calibration range and analytes were shifted between 6010 and 6020 in order to get the 'best result' due to saltwater interferences. However, of the metals listed in the comment, Sb, As, Cd, Cr, Co, Cu, Ni, Se, Ag, and V were not determined to be potential contaminants of concern in surface water based on the sediment results (i.e., where the source would be if they were contaminants in surface water). For this project, analytes were identified as potential contaminants of concern in surface water (due to sediment) if they exceeded a screening level in sediment and also background sediment. Therefore, multiple lines of evidence were used to determine these constituents were not of contaminants of potential concern in surface water. For Pb, Tl, and Zn, however, it was determined that more information was needed (potential issue in sediment combined with uncertainty in surface water due to LOD > SL). Because tissue samples were already scheduled for collection and analysis of these constituents, it was determined (with regulator agreement) that further surface water sampling was not required during the biota sampling. Note that specialty preparation and analytical techniques were used for the tissue samples for PCB congeners in addition to these select metals.

b. Worksheet #11 of the 2010 SAP specifies that the elevated LODs would be evaluated in the uncertainty sections of the risk assessments. These evaluations were not provided in the human health risk assessment provided in the FS report.

Navy Response:

For chemicals that were 100% non-detected in an environmental matrix, a comparison of the detection limits to the screening levels has been added as Attachment E-7 to the HHRA and the following text was added to Section 5.6 in Appendix E (uncertainty section of the HHRA):

"For chemicals that were 100 percent non-detected in surface soil, sediment, or surface water, the maximum non-detected values were compared to the respective EPA RSLs. The surface soil results were compared to adjusted residential and industrial soil RSLs, the sediment results were compared to adjusted residential soil RSLs, and the surface water results were compared to adjusted tapwater RSLs. The screening comparison is provided in Attachment E-7 and the results are discussed below for each medium:

- Surface Soil - Three pesticides (aldrin, dieldrin, and toxaphene), three SVOCs [bis(2-chloroethyl)ether, n-nitroso-di-n-propylamine, and pentachlorophenol], one PAH [dibenz(a,h)anthracene], and one metal (thallium) exceeded their respective RSLs in surface soil in the North Area.
- Sediment – One VOC (1,2-dibromo-3-chloropropane) and one PAH [dibenz(a,h)anthracene] exceeded their respective RSLs in sediment.
- Surface Water – Twelve VOCs, four pesticides, five PAHs, two PCBs, and nine metals exceeded their respective RSLs in surface water.

Although the maximum detection limits of some chemicals in soil, sediment, or surface water samples exceed their respective RSLs, this is expected to have little impact on the overall risk conclusions because detected chemicals from the same analytical groups and media were not identified as COCs. Therefore, it is unlikely that the non-detected chemicals would have been identified as COCs in the HHRA. Additionally, if they were to be present at the site, they are likely co-located with elevated concentrations of chemicals from the same analytical group that were identified as COPCs in the HHRA."

Appendix E, Post-Removal Human Health Risk Assessment

1. Pages E-2-1 to E-2-2, Sections 2.1.1, 2.1.2, and 2.1.3: Please discuss the various analytical methods used to analyze PCBs, as different methods were used for different media.

Navy Response:

The following text was added to the end of the second paragraph in Section 2.1.1:

"The surface soil samples collected in 2009 were analyzed for PCBs using Method 8081A, whereas the surface soil samples collected in 2011 were analyzed for PCBs using Method 8082. Method 8082 is the preferred method for analyzing PCBs because it includes specific cleanup and quantitation procedures designed for PCB analysis (EPA, 2012)."

The following text was added to the end of Section 2.1.2:

"The surface water and sediment samples were analyzed for PCBs using Method 8082."

The following sentence was added as the new 2nd to last sentence in the first paragraph of Section 2.1.3:

"The biota samples were analyzed for PCBs using Method 1668A."

2. Page E-2-1, Section 2.1.2: Please provide a reference to the section where the analysis was conducted that concluded that the two surface water and sediment samples collected north of SWMU 6 were representative of background conditions.

Navy Response:

The technical memorandum prepared by CH2MHILL on September 23, 2011 presenting the statistical evaluation of background surface water and sediment data associated with the SWMU 6 investigation was added as Attachment E-8 to the HHRA. In addition, the following text was added to Section 2.1.2:

"The derivation of background levels for surface water and sediment is discussed in Section 2.2.2. and presented in Attachment E-8 of the HHRA."

3. Page E-2-2, Section 2.2.1: Section 2.1.1 states "Subsequent samples (those collected in 2011) were analyzed for hexavalent chromium in addition to total chromium since the RSL for "total chromium" was eliminated from the EPA RSL table in December 2009. No separate analysis was conducted for trivalent chromium since it is standard protocol to calculate trivalent chromium concentrations by subtracting hexavalent chromium from total chromium concentrations." Therefore, please clarify why the trivalent chromium RSL was used to screen total chromium data when the text indicates that trivalent and hexavalent chromium concentrations are known, indicating that sufficient data is available to screen these two chromium species as separate chemicals.

Navy Response:

Only the newer analytical data were speciated. The last sentence in Section 2.1.1 was deleted to avoid confusion. A multiple-lines-of-evidence approach was implemented to identify the appropriate RSL for the "total chromium" data. The following text was added after the ninth sentence in Section 2.2.1:

"A multiple-lines-of-evidence approach was used to identify the appropriate RSL for use with the "total chromium" results, as follows:

- Based on a review of the soil types and related geochemistry on Vieques Island, hexavalent chromium is not expected to be present in significant quantities (as described in attached memorandum "Chromium Speciation at SWMU 6").
- Hexavalent chromium concentrations in lagoon surface water and sediment are within background levels (see Section 2.2.2).
- Although hexavalent chromium data are not available for background soil, the maximum detected onsite total chromium concentrations in soil are less than background soil concentrations.
- There was no observed source of hexavalent chromium in the former trash piles (i.e., potential source areas) situated onsite."

4. E-2-2, Section 2.2: Please discuss in this section whether any nondetect chemical eliminated from consideration as a COPC had detection limits that exceeded the PAL and if so, whether there is any indication that the chemical may be present, based on detections in other media. Although elevated detection limits may be addressed in the Uncertainty Section, the rationale for not included them needs to be presented in this section, consistent with EPA's RAGS Part A.

Navy Response:

Please see the response to Appendix A Comment #1.b. Also, only detected chemicals are considered in the COPC screening, in accordance with the Vieques Master HHRA protocol, which states: "The detected

constituents at each site will be screened to select the COPCs in accordance with EPA guidance (EPA, 1989)."

PREQB Evaluation of Response:

To ensure that the Master HHRA protocol is not used as the basis for not evaluating nondetect chemicals to determine whether the chemicals should be considered COPCs, PREQB prefers that the language of the Master HHRA protocol be revised so as not to be construed as restricting the Data Evaluation section of a HHRA to only consider detected chemicals. However, PREQB will defer to EPA on this issue.

Navy Response to Evaluation:

The Master HHRA protocol procedures and language were finalized in 2010 after multiple rounds of reviews by all stakeholder agencies including PREQB and USEPA. Because no changes to the COPC selection process have been made to USEPA guidance since 2010, the Navy proposes that no changes to the Master HHRA protocol are warranted at this time.

PREQB Evaluation of Response to Evaluation:

As stated in PREQB's Evaluation of Response, PREQB prefers that a discussion of whether nondetect chemicals should be included as COPCs based site history data and detects in other media be included in the Data Evaluation Section consistent with Section 5.3 of EPA's RAGS Part A; however, PREQB will defer to EPA on this issue.

Navy Response:

The Navy discussed this with USEPA, and USEPA indicated that the process for COPC selection presented in the Master HHRA protocol reflects EPA's RAGS Part A. Therefore, no change will be made to the Navy responses provided on this issue or to the Master HHRA protocol at this time.

PREQB Evaluation of Response:

PREQB provided comment on this issue based on the following requirements of Section 5 of RAGS Part A, which discusses the Data Evaluation section of an HHRA. Section 5.3.5 states "If information exists to indicate that the [nondetect] chemicals are present, they should not be eliminated. For example, if chemicals with similar transport and fate characteristics are detected frequently in soil at a site and some of these chemicals also are detected frequently in ground water while the others are not detected, then the undetected chemicals are probably present in the ground water and therefore may need to be included in the risk assessment as groundwater contaminants." This concept is further repeated in Section 5.8, which states "chemicals that were not detected in samples from a given medium (i.e., non-detects) but that may be represent at the site also may be included in the risk assessment if an evaluation of the risk potentially present at the detection limit is desired." PREQB prefers that a discussion considering whether non-detect chemicals should be included in the datasets be presented in the Data Evaluation section of an HHRA; however, the response indicates that USEPA Region 2 considers only chemicals that have been detected in a particular medium as COPCs, regardless of fate and transport or elevated detection limit considerations. Therefore, PREQB has no further comment on this issue.

5. Page E-3-1, Section 3.1:

   a. Please add text clarifying that BCFs or BSAFs were used to calculate biota tissue concentrations for those COPCs not detected in fish tissue samples.

Navy Response:

The first sentence of the first bullet under fish consumers/blue crab consumers in Appendix E Section 3.1 was revised to state:

"Fish and blue crab EPCs were modeled using surface water concentrations and a bioconcentration factor (BCF) for the surface water COPCs for fish/blue crab that were not analyzed in the biota samples."

The first sentence of the second bullet under fish consumers/blue crab consumers in Appendix E Section 3.1 was revised to state:

"Fish and blue crab EPCs were modeled using sediment concentrations and a BSAF for the sediment COPCs for fish/blue crab that were not analyzed in the biota samples."

b. Please clarify why tetrachloroethylene, nickel and silver BCFs or BSAFs are not presented in Attachment E-4.

Navy Response:

The BSAFs for tetrachloroethene, nickel and silver are not provided in Attachment E-4 because a default value of 1 was used as the BSAF for these COPCs. The following text was added at the end of the second bullet under fish consumers/blue crab consumers in Appendix E Section 3.1:

"Three COPCs (nickel, silver, and tetrachloroethene) are not included in Attachment E-4 because a default value of 1 was used as the BSAF for these COPCs."

6. Page E-5-7, Section 5.5.3: This section states "Pesticides in sediment (used to model fish concentrations) are present as a result of application to soil to control pests." As this area was an uncontrolled dump site, it is unclear that the Navy can state with certainty why these pesticides were detected at SWMU 6. Please reiterate the discussion presented in the HHRA Summary section of the FS report (Section 3.4) in this section of the HHRA, as Section 3.4 of the FS indicates that the concentrations of these pesticides detected at SWMU 6 are indicative of normal pesticide use and provides reference to the Appendix with supporting data.

Navy Response:

The second sentence in Section 5.5.3 was revised to state:

"The concentrations of pesticides detected in SWMU 6 media are consistent with concentrations detected across multiple sites on West Vieques (see Appendix X of the SWMU 4 RI/FS Report and Appendix I of this FS Report) and attributed to normal pesticide application (CH2M HILL, 2012b)."

7. Page E-5-8, Section 5.6.2: Please discuss the uncertainty associated with the revised number of meals per month.

Navy Response:

Please see responses to Page-Specific Comments #8 and #10c. The second and third paragraphs of Appendix Section 5.6.2 discuss the uncertainties associated with an ingestion frequency of 1 meal per month. The second paragraph of Appendix Section 5.6.2 was revised as follows:

"A site-specific exposure frequency of two fish or blue crab meals per week was initially identified prior to the biota sampling event, and was used in the HHRA to estimate potential risks associated with consumption of fish and blue crab caught from the lagoon. As discussed in Section 3.2.2, an ingestion frequency of two meals per week was considered to be overly conservative due to the very small number of edible-size fish and blue crab present in the lagoon after the biota sampling event in January/February 2012 indicated a scarcity of edible-size fish and blue crabs and due the physical nature of the lagoon. If fish or blue crab consumers attempted to fish or crab at the SWMU 6 lagoon more than once a month, they would likely be unsuccessful in catching fish or crab and go elsewhere, such as adjacent Kiani Lagoon, which provides more opportunities for repeated successful fishing. Therefore, an exposure frequency of one meal per month is considered more representative of site conditions and a more sustainable ingestion rate over the assumed exposure duration."

PREQB Evaluation of Response:

Please refer to PREQB's Evaluation of Response to Page-Specific Comment 8.

Navy Response to Evaluation:

Please refer to the Navy's response to PREQB's Evaluation of Response to Page-Specific Comment 8.

PREQB Evaluation of Response to Evaluation:

Please refer to PREQB's Evaluation of Response to Evaluation for Page-Specific Comment 8.

Navy Response:

Please see the response to PREQB's Evaluation of the Response to PREQB Comment 8 above.

PREQB Evaluation of Response to Evaluation:

Please refer to PREQB's Evaluation of Response to Evaluation for Page-Specific Comment 8.

8. Attachment E-1, RAGS Part D Tables: Table 2s: Please clarify why the maximum detection limits presented in this table do not appear to be consistent with the data presented in Table 2-1. The maximum detection limit presented in this table is 1E+5 mg/kg for many chemicals. Please clarify or revise the table to indicate the maximum detection limit for samples reported as nondetect (U-qualified).

Navy Response:

The maximum detection limit of 1E+5 mg/kg was replaced with the correct detection limits in revised Tables 2.1 and 2.1a in Attachment E-1 and revised Attachment E-8.

9. Attachment E-3, Tables: For clarity, please revise the title of the risk calculation tables or provide a footnote indicating that these tables present the risks for consuming 1 meal/month.

Navy Response:

Please refer to the response to Page-specific Comment #10C. Tables 4-1-1 to 4-2-6 have been removed from Attachment E-3.

Appendix F, Post Removal Ecological Risk Assessment

1. Page F-9, Section 1.3.1: The text states that the sample quantitation limit (SQL) or reporting limit was used to represent the concentration for nondetect results. Please revise the text to state that the LOD was used (and not the SQL or reporting limit).

Navy Response:

The last bullet in Section 1.3.1 has been replaced with the following:

"For non-detected results, the limit of detection (LOD) was used to represent the concentration. When calculating statistics (e.g., arithmetic mean), one-half of the LOD was used for non-detected results."

2. Page F-10, Section 1.3.3.1: The mean measured site-specific TOC from the SWMU 6 samples was reported to be 1.94 percent. It appears that this value also includes TOC results from the Laguna Kiani complex lobe which was not evaluated for risk to higher trophic level receptors. Please use the mean site-specific TOC from the SWMU lagoon sediment samples (1.43 percent) in calculating benthic invertebrate concentrations.

Navy Response:

The TOC value has been changed to the SWMU 6 lagoon site-specific mean of 1.43 percent for calculation of bioaccumulation factors for estimating benthic invertebrate tissue concentrations. In Section 1.3.3.1 and in Table F-8, the TOC value of 1.94 percent was changed to 1.43 percent.

3. Page F-11, Section 1.3.3.2: The mean measured site-specific TOC from the SWMU 6 samples was reported to be 1.94 percent. It appears that this value also includes TOC results from the Laguna Kiani complex lobe which was not evaluated for risk to higher trophic level receptors. Please use the mean site-specific TOC from the SWMU lagoon sediment samples (1.43 percent) in calculating fish concentrations.

Navy Response:

The TOC value has been changed to the SWMU 6 lagoon site-specific mean of 1.43 percent for calculation of bioaccumulation factors used for estimating whole-body fish tissue concentrations. In Section 1.3.3.2 and in Table F-10, the TOC value of 1.94 percent was changed to 1.43 percent.

4. Page F-13, Section 1.4.1: The report states that by using the site-specific TOC content from sediment, the site-specific toxicity can be evaluated using the equilibrium partitioning (EqP) approach for which the calculations are presented in Attachment B. However, Attachment B appears to use an assumed TOC of 1 percent rather than the site-specific TOC content. Please clarify or correct.

Navy Response:

For clarification, the last sentence of Section 1.4.1 will be changed to the following:

"Literature based marine sediment EqP values, as documented in the final ERA Protocol (CH2M HILL, 2010a), are provided in Table F-15. For non-ionic organic chemicals analyzed in site sediment but not listed in Table 15, EqP values were calculated using the equation above (Appendix B). These EqP values, which are all based on 1 percent TOC, can be adjusted (normalized) to site-specific TOC values as appropriate to derive site-specific ESVs."

Site-specific, TOC normalized EqP values are calculated later in the ERA, in Tables F-25 (SWMU 6 Lagoon) and F-31 (Laguna Kiani Complex Lobe).

5. Page F-14, Section 1.4.2: The report states that avian toxicological data for some chemicals includes more than one test species as presented in Table F-19. Please include the additional avian lead toxicity value presented in CH2MHill (2010a) for the chicken. In addition, please provide additional clarification regarding the process used to select the applicable test organism for the green heron and spotted sandpiper.

Navy Response:

For lead, the TRV for the American kestrel (a carnivore) was considered a more representative value for the spotted sandpiper (an invertivore) and green heron (an invertivore/piscivore) than the TRV for the chicken (an herbivore/granivore) based upon dietary composition (consumption of animal-based prey items versus plant-based prey items for the chicken). Thus, the addition of the chicken TRV for lead is not warranted. As noted in the text of Section 1.4.2, factors such as dietary composition and trophic level were used when deciding which TRV from the final ERA protocol (for chemicals with multiple values) to assign to each receptor that was evaluated at the site. Other factors include taxonomic relatedness and preferred habitat (e.g., terrestrial versus aquatic).

6. Page F-21, Section 1.5.6.1: A comparison of the detected concentrations of 2-butanone and carbon disulfide in lagoon sediment samples with their corresponding freshwater EqP values was conducted. It is suggested

that this comparison use the sample-specific TOC value in calculating the EqP values for the maximum concentrations.

Navy Response:

Please see the response to Page-specific Comment #12.

7. Page F-22, Section 1.5.6.1: The report notes that the 0.4 acre of open water habitat and 0.1 acre of tidal mudflat habitat would be of insufficient size to support a foraging spotted sandpiper as that species is expected to forage primarily within the mudflat habitat. Please provide additional discussion regarding the foraging range of a spotted sandpiper (citing references providing specific foraging ranges) to support this statement. In addition, the spotted sandpiper represents an indicator species for the avian invertivore foraging guild. It should be noted that other shorebirds potentially using the SWMU 6 lagoon may forage within the tidal mudflat as well as within the shallow water portions of the open water habitat.

Navy Response:

In Section 1.5.6.1, page F-22, the first paragraph has been updated (see underlined text) as follows:

"**Food Web.** Both copper and lead had HQs that exceeded one based upon the MATC, the threshold for a potential adverse effect. The HQ based upon the LOAEL also exceeded one for copper. The MATC-based HQ for copper (spotted sandpiper) was low (1.87) and the LOAEL-based HQ was only slightly above one (1.08). For lead, the MATC-based HQ (also for the spotted sandpiper) was just slightly above one (1.04) and the LOAEL-based HQ was less than one (0.47). Typically, the SWMU 6 lagoon contains about 0.4 acre of open water, along with about 0.1 acre of intertidal mudflat. Spotted sandpiper foraging at the site would generally be limited to the intertidal, mudflat habitat. <u>The home range for the spotted sandpiper is variable and larger than found at SWMU 6, reported as a mean of about 0.6 acres (Maxson and Oring, 1980) and 12 acres (Miller and Miller, 1948), and as 2.5, 4.5 and 8.0 acres for individually tracked birds (Hays, 1972). The spotted sandpiper is an indicator species representative of the avian invertivore foraging guild within the project area that includes other shorebird species such as the least sandpiper, semipalmated plover, black-necked stilt, and black-bellied plover, all of which may forage along the intertidal habitat and/or within the shallow water fringe of the lagoon.</u> Although an AUF of one was assumed in the ERA, the available habitat within the site boundary would not provide sufficient forage for this receptor. Thus, its potential exposure at the site is unlikely to result in unacceptable risks given the magnitude of the risk estimates (assuming an AUF of one). For this reason, neither copper nor lead are considered COCs for aquatic food web exposures at the site."

In addition, the underlined text will be inserted into Section 4.4.1 of the Feasibility Report, seventh paragraph (page 4-4).

(References to be added to Appendix F, Section 1.7)

Hays, H. 1972. Polyandry in the spotted sandpiper. Living Bird 11:43-57.

Maxson, S. J.; Oring, L. W. (1980) Breeding season time and energy budgets of the polyandrous spotted sandpiper. Behaviour 74: 200-263.

Miller, J. R., and J. T. Miller. 1948. Nesting of the spotted sandpiper at Detroit, Michigan. Auk 65:558-567.

Myers, J. P., and L. P. Myers. 1979. Shorebirds of coastal Buenos Aires Province, Argentina. Ibis 121:186-200.

8. Page F-22, Section 1.5.6.1: The report indicates that the results of the crab and fish sampling conducted within the SWMU 6 lagoon were evaluated for the aquatic food web models and this evaluation did not result in any changes to the risk assessment conclusions. Additional discussion should be provided in the text regarding

this analysis (e.g., HQs associated with NOAEL, MATC and LOAEL TRVs for each of the receptor species). Although the tissue samples are not directly comparable to the food items ingested by the receptors (tissue samples were collected from organisms that are generally larger than ingested by the receptors as stated earlier in the report), the detected concentrations are likely to be more representative of actual exposure (yet conservative as larger crabs and fish were sampled that presumably contain higher contaminant concentrations than smaller crabs/ fish) than the modeled concentrations within their diets. This should be reflected in the text along with the HQ results.

Navy Response:

In Section 1.5.6.1, the following paragraphs (same as provided in response to Page Specific Comment #13) will replace the second paragraph on page F-22, under the heading "Food Web":

"In addition, mean concentrations of the metals (lead and zinc) and PCBs detected in blue crab and fish (mullet and snook) tissue samples collected for evaluation of potential human exposures were entered into the aquatic food web models (see Appendix F, Attachment D). Food web receptors included the spotted sandpiper, green heron, and fishing bat, all of which normally consume small prey items such as polychaetes, fiddler crabs, and small fish (< 3 inches). The analyzed organisms, which included whole body crabs (average 4 inch carapace width) and whole body (gutted) fish (average 11 inches total length), do not represent typical prey items for these wildlife receptors primarily because of their large sizes. Considering this uncertainty, site specific tissue data can be more representative of actual exposure relative to modeled dietary concentrations. The same aquatic food web models used in the ERA (Appendix F) were used for this tissue evaluation except that mean blue crab concentrations were substituted for modeled mean benthic invertebrate concentrations and mean fish concentrations (both species combined) were substituted for modeled fish concentrations.

Results of the food web models indicated only lead had an MATC-based HQ that exceeded one (HQ = 1.03) for the spotted sandpiper, the defined threshold for a potential adverse effect in the final ERA protocol, although the HQ based upon the LOAEL was less than one for lead. For the spotted sandpiper, lead exposure at the site is unlikely to result in unacceptable risk given the low magnitude of the risk estimate. For the green heron, HQs based on NOAEL, MATC, and LOAEL TRVs were all less than one. The fishing bat had a NOAEL-based HQ of 1.9 for dioxin-like PCBs (TEQ), but MATC and LOAEL-based HQs were less than one; HQs for all other parameters were less than one. This additional evaluation of tissue data collected to support potential HHRA exposure scenarios did not result in any changes to the above conclusions of the ERA."

9. Page F-22, Section 1.5.6.1: A comparison of the detected concentrations of 2-butanone and carbon disulfide in the Laguna Kiani complex lobe sediment samples with their corresponding freshwater EqP values was conducted. It is suggested that this comparison use the sample-specific TOC in calculating the EqP values for the maximum concentrations.

Navy Response:

Please see the response to Page-specific Comment #12.

10. Page F-23, Section 1.5.7: The report concludes that cadmium, copper, lead and zinc were identified as COCs in the lagoon sediment for exposure by lower trophic level receptors (benthic organisms) but risks are considered acceptable under current site conditions for these receptors. Please revise this summary or provide additional clarification as the current wording suggests that there is acceptable risk to lower trophic level receptors from sediment exposure.

Navy Response:

The last sentence in Section 1.5.7 of Appendix F, and in Section 4.5 of the Feasibility Study Report, will be changed to the following:

"Thus, with the exception of potential risk to benthic organisms exposed to certain metals (cadmium, copper, lead, and zinc) in SWMU 6 sediment, risks to all other ecological receptors are considered acceptable under current site conditions for these areas, media, and exposure pathways."

PREQB Evaluation of Response: The response is acceptable, however, based on an earlier response, cadmium and copper should be omitted from the revised statement as these metals are not considered to present a risk to benthic organisms.

Navy Response to Evaluation:

The revised statement correctly reflects the conclusions of the Post-Removal ERA, and therefore is accurate as is. Note that the benthic organism ERA conclusions, as detailed in Appendix F and summarized in Section 4.5 of the FS, were based on comparison of sediment concentrations to ecological screening values, which for cadmium, copper, lead, and zinc were ER-L values. It was noted in the ERA that cadmium and copper did not exceed the less conservative ER-M screening values; however identification of final sediment COCs (cadmium, copper, lead, and zinc) was based on comparison to ER-L values as required in the ERA Protocol.

As described in comment response 5c above, the FS subsequently supported the use of ER-M values for development of sediment PRGs. Since the maximum site concentrations of cadmium and copper were below the ER-M values, remedial action for these metals was determined not to be necessary.

11. Table F-8: The mean TOC of SWMU 6 samples is listed in this table as 1.94 percent. The mean TOC in lagoon sediment samples is 1.43 percent (excluding the off-site sediment samples collected from the Laguna Kiani). Please correct and recalculate BAFs for benthic invertebrates. Table F-10: The mean TOC of SWMU 6 samples is listed in this table as 1.94 percent. The mean TOC in lagoon sediment samples is 1.43 percent (excluding the off-site sediment samples collected from the Laguna Kiani). Please correct and recalculate BAFs for fish.

Navy Response:

In Tables F-8 and F-10, the TOC value of 1.94 percent was changed to 1.43 percent and the associated BAFs for fish and invertebrates recalculated. The adjusted (slightly increased) BAFs were subsequently updated in the aquatic food web exposure calculations for the SWMU 6 Lagoon (Tables F-26, F-27, and F-28).

12. Table F-19: The avian toxicity ingestion values presented for lead only include a study on the American kestrel while the avian toxicity values presented in CH2MHill (2010a) present values for both the kestrel and chicken. Please specify in the text why the kestrel toxicity ingestion value is believed to be more representative as a toxicity value for the green heron and spotted sandpiper than the more conservative lead toxicity value presented for the chicken (USEPA, 2005g). In addition, the kestrel toxicity value of 3.85 mg/kg-BW/day as a NOAEL was derived from a study by Pattee (1984) as reported in Sample et al. (1996). However, this same study as reported in the lead eco-SSL document (USEPA, 2005g) presents a NOAEL value of 12 mg/kg-BW/day. Please clarify this apparent discrepancy.

Navy Response:

Please see the response to Appendix F Comment 5. The Pattee study reports test doses in ppm diet. To convert these doses to mg/kg BW/day, values for body weight (kg) and food ingestion rate (kg/day) are required. Because the Sample et al. and Eco-SSL documents used different values for these parameters in the conversion, the resulting TRV differs. It should be noted that the Sample et al. value, which was used in the ERA, is the more conservative of the two TRV values.

Review of the Draft Final Feasibility Study Report from PREQB (submitted 1-10-13)

1. Section 5.4: Please provide a reference to the section or appendix that presents the calculations supporting the PRG of 2E-06 mg/kg for dioxin-like PCBs. Note that as PREQB has commented on in our original Comment 16b and subsequent evaluations of the Navy's responses to this comment, this value presents a PRG for 2,3,7,8-TCDD rather than the dioxin-like PCBs. The appropriate toxicity criteria for dioxin-like PCB congeners need to be used in calculating the dioxin-like PCB PRGs (or the appropriate congener-specific TEF needs to be applied to the dioxin PRG to convert the value to PRGs for each dioxin-like PCB congener).

   Navy Response:

   The following revised text was added after the 3rd bullet of Section 5.4:

   "The toxicity of dioxin-like PCBs was not incorporated into the sediment PRG. Sediment PRGs below the proposed sediment PRG of 0.2 mg/kg for Aroclor 1254 would be technically impractical to achieve, and would be inconsistent with PRGs for other sediment remediation sites (which are typically based on "total PCBs").

Exhibit 1

Calculation of Sediment Preliminary Remedial Goal (PRG): Dioxin-Like PCBs

SWMU 6

Former NASD, Vieques, Puerto Rico

Step 1 - Calculation of BSAFs

Sample	Biota Type	Biota - Total Dioxin-Like PCB Congener Conc. (pg/g)	Biota - Total Dioxin-Like PCB Congener Conc. (mg/kg)	Empirical BSAF (unitless)	Average BSAF	Median BSAF	Maximum BSASF
VWW06-FS01-0112	Fish	13028	0.0130	1.840	3.61	1.84	11.75
VWW06-FS01P-0112	Fish	14793	0.0148	2.089			
VWW06-FS02-0212	Fish	12868	0.0129	1.817			
VWW06-FS03-0212	Fish	83210	0.0832	11.751			
VWW06-FS04-0112	Fish	3765	0.0038	0.532			
VWW06-CRB01-0112	Blue Crab	8578	0.0086	1.211	1.16	1.36	1.37
VWW06-CRB01P-0112	Blue Crab	9694	0.0097	1.369			
VWW06-CRB02-0112	Blue Crab	9672	0.0097	1.366			
VWW06-CRB03-0112	Blue Crab	9596	0.0096	1.355			
VWW06-CRB04-0112	Blue Crab	3696	0.0037	0.522			
Estimated dioxin-like PCBs congener concentrations in sediment† (mg/kg) =				0.00708			

Notes:
To avoid influence from an extremely high concentration of PCB in one fish sample (FS03-0212),
the median fish Biota-sediment accumulation factor (BSAF) was used as a central tendency value for SWMU 6.
BSAF = Total dioxin-like PCB congener conc. in biota/ Estimated dioxin-like PCB congener conc. in sediment
† Refer to Exhibit 1 Supplement.

Step 2 - Calculation of Fish PRGs (mg/kg)

	Exposure Assumption				Biota PRG (mg/kg) (Based on Target ELCR)			Biota PRG (mg/kg) (Based on Target HI)
	BW (kg)	EF (meals/yr)	IR (kg-fish/meal)	ED (year)	1E-04	1E-05	1E-06	1.0
Adult	70	12	0.227	24	2.10E-05	2.10E-06	2.10E-07	6.57E-06
Youth	39	12	0.227	10	2.81E-05	2.81E-06	2.81E-07	3.66E-06
Child	15	12	0.114	6	3.59E-05	3.59E-06	3.59E-07	2.80E-06
	ATC	25550	days					

Toxicity Values	CSF	1.30E+05	1/(mg/kg-day)
	RfD	7.00E-10	mg/kg-day

CSF: 2,3,7,8-TCDD (Cal/EPA)
RfD: 2,3,7,8-TCDD (IRIS)

PRG Equations 1&2

*Biota PRG (carc.) = (TR * BW * ATC) / (EF * IR * ED *CSF)*

*Biota PRG (non-carc.) = (THI * BW * ED * 365 * RfD) / (EF * IR * ED)*

Notes:
TCDD - 2,3,7,8-Tetrachlorodibenzodioxin
Cal/EPA - California Environmental Protection Agency
IRIS - Integrated Risk Information System
CSF - cancer slope factor
RfD - oral reference dose
BW - body weight
EF - exposure frequently
IR - ingestion rate
ED - exposure duration
ELCR - excess lifetime cancer risk
HI - hazard index
TR - target risk
THI - target hazard index

Step 3 - Calculation of Sediment PRG (mg/kg)

Sediment PRG (mg/kg)

		BSAF	Sediment PRG (mg/kg) (Based on Target ELCR)			Sediment PRG (mg/kg) (Based on Target HI)
			Based on Adult EF			Based on Child EF
			1E-04	1E-05	1E-06	1
Fish	Median Fish BSAF	1.84	1E-05	1E-06	1E-07	2E-06

PRG Equation 3

Sediment PRG = Biota PRG / BSAF

Notes:
Sediment PRGs were calculated using adult exposure assumptions for carcinogenic toxicity endpoint and
child exposure assumptions for non-carcinogenic toxicity endpoint.

Exhibit 1 Supplement

Dioxin-Like Congener Profile Distribution for Aroclor-1254 in Sediment based on Literature Source

SWMU 6

Former NASD, Vieques, Puerto Rico

Dioxin-Like Congener	Congener profile distribution (fraction) of Aroclor-1254[1]
3,3',4,4'-Tetrachlorobiphenyl (77)	0.00196
2,3,4,4',5-Pentachlorobiphenyl (114)	0.07842
2,3',4,4',5'-Pentachlorobiphenyl (123)	0.00317
3,3',4,4',5-Pentachlorobiphenyl (126)	0
Congeners (156/157)	0
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	0
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	0.00047
2,3,3',4,4'-Pentachlorobiphenyl (105)	0.0004
2,3',4,4',5-Pentachlorobiphenyl (118)	0.00365
3,4,4',5-Tetrachlorobiphenyl (81)	0.00052
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	0
Total fraction of dioxin-like PCBs in Aroclor-1254 =	0.0886
Sediment Avg. Aroclor-1254 concentration (mg/kg)[2] =	0.0799
Estimated dioxin-like PCBs congener concentration in sediment (mg/kg) =	0.00708
Estimated non-dioxin-like PCBs congener concentration in sediment (mg/kg) =	0.0728

Notes:

[1] From Table C-2 of the following literature source: Martinez Araneda, Andres Jose. "Release of polychlorinated biphenyl congeners in a contaminated harbor and canal." dissertation, University of Iowa, 2010. http://ir.uiowa.edu/etd/707.

[2] Site-specific average sediment concentration; one-half the detection limit was used for non-detected results.

Exhibit 2

Calculation of Sediment Preliminary Remedial Goal (PRG): Non-Dioxin-Like PCBs

SWMU 6

Former NASD, Vieques, Puerto Rico

Step 1 - Calculation of BSAFs

Sample	Biota Type	Biota - Total Non-Dioxin-Like PCB Congener Conc. (pg/g)	Biota - Total Non-Dioxin-Like PCB Congener Conc. (mg/kg)	Empirical BSAF (unitless)	Average BSAF	Median BSAF	Maximum BSASF
VWW06-FS01-0112	Fish	48572	0.0486	0.667	2.36	0.77	9.12
VWW06-FS01P-0112	Fish	56412	0.0564	0.774			
VWW06-FS02-0212	Fish	55959	0.0560	0.768			
VWW06-FS03-0212	Fish	664194	0.6642	9.118			
VWW06-FS04-0112	Fish	33558	0.0336	0.461			
VWW06-CRB01-0112	Blue Crab	56867	0.0569	0.781	0.57	0.54	0.86
VWW06-CRB01P-0112	Blue Crab	62381	0.0624	0.856			
VWW06-CRB02-0112	Blue Crab	35199	0.0352	0.483			
VWW06-CRB03-0112	Blue Crab	39154	0.0392	0.537			
VWW06-CRB04-0112	Blue Crab	15594	0.0156	0.214			
Estimated non-dioxin-like PCBs congener concentrations in sediment† (mg/kg) =				0.0728			

Notes:

To avoid influence from an extremely high concentration of PCB in one fish sample (FS03-0212),
the median fish Biota-sediment accumulation factor (BSAF) was used as a central tendency value for SWMU 6.

BSAF = Total dioxin-like PCB congener conc. in biota/ Estimated non-dioxin-like PCB congener conc. in sediment

† Refer to Exhibit 1 Supplement.

Step 2 - Calculation of Fish PRGs (mg/kg)

	Exposure Assumption				Biota PRG (mg/kg) (Based on Target ELCR)			Biota PRG (mg/kg) (Based on Target HI)
	BW (kg)	EF (meals/yr)	IR (kg-fish/meal)	ED (year)	1E-04	1E-05	1E-06	1.0
Adult	70	12	0.227	24	1.37	0.14	0.014	0.19
Youth	39	12	0.227	10	1.8	0.18	0.018	0.10
Child	15	12	0.114	6	2.3	0.23	0.023	0.08
	ATC	25550	days					

Toxicity Values			
	CSF	2.00E+00	1/(mg/kg-day)
	RfD	2.00E-05	mg/kg-day

CSF: High Risk Polychlorinated Biphenyls (IRIS)
RfD: Aroclor 1254 (IRIS)

PRG Equations 1&2

*Biota PRG (carc.) = (TR * BW * ATC) / (EF * IR * ED *CSF)*

*Biota PRG (non-carc.) = (THQ * BW * ED * 365 * RfD) / (EF * IR * ED)*

Notes:

TCDD - 2,3,7,8-Tetrachlorodibenzodioxin
Cal/EPA - California Environmental Protection Agency
IRIS - Integrated Risk Information System
CSF - cancer slope factor
RfD - oral reference dose

BW - body weight
EF - exposure frequently
IR - ingestion rate
ED - exposure duration

ELCR - excess lifetime cancer risk
HI - hazard index
TR - target risk
THI - target hazard index

Step 3 - Calculation of Sediment PRG (mg/kg)

Sediment PRG (mg/kg)

		BSAF	Sediment PRG (mg/kg) (Based on Target ELCR) Based on Adult EF			Sediment PRG (mg/kg) (Based on Target HI) Based on Child EF
			1E-04	1E-05	1E-06	1
Fish	Median Fish BSAF	0.77	1.8	0.18	0.018	0.1

PRG Equation 3

Sediment PRG = Biota PRG / BSAF

Notes:

Sediment PRGs were calculated using adult exposure assumptions for carcinogenic toxicity endpoint and
child exposure assumptions for non-carcinogenic toxicity endpoint.

Exhibit 3

Calculation of Sediment Preliminary Remedial Goal (PRG)

SWMU 6

Former NASD, Vieques, Puerto Rico

Parameter	Calculated Sediment PRG	Basis
Dioxin-Like PCBs	2E-06	Hazard index of 1 based on child exposure assumptions for non-carcinogenic toxicity endpoint
Non-Dioxin-Like PCBs	0.1	Hazard index of 1 based on child exposure assumptions for non-carcinogenic toxicity endpoint

Final Response to FWS Comments on the Draft Feasibility Study Report Solid Waste Management Unit 6 (SWMU-6) Former Naval Ammunition Support Detachment Vieques, Puerto Rico

General Comment

A wetland is defined as "an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation." Prior to the interim removal action, an intact wetland plant community dominated by black mangrove (*Avicennia germinans*), an obligate wetland species, existed in on the site.

In the executive summary, the introduction and elsewhere in the document, SWMU-6 is described as a terrestrial area. From a colloquial point of view this may be correct, but it is technically inaccurate to describe a wetland area as terrestrial. The FWS requests that in the site description (Section 2.1), SWMU-6 be described as an estuarine, intertidal, forested wetland dominated by black mangrove, and that throughout the remainder of the document, the term terrestrial will be analogous to a forested and/or vegetated wetland area that is not permanently inundated.

Navy Response:

As discussed in the August 2012 Technical Subcommittee meeting, prior to the interim removal action, the SWMU 6 site was a wetland habitat, dominated by black mangrove and intermittently inundated by tidal fluctuations. Under post-removal conditions, the site has a lower elevation with a greater degree of tidal inundation but remains a shallow wetland habitat within which mangroves (both red and black mangrove) are becoming re-established. Adjustments to the document are provided below.

In Section 2.1, the third paragraph has been replaced by the following (new language underlined):

"The waste pile and contaminated soil were removed during an interim removal action in 2009. The overall goal of the interim removal action was to eliminate the uncertainty of the debris being a potential future source of contamination by removing the debris and associated contaminated soil, where present.

<u>Prior to the removal action, the SWMU 6 site was predominantly an estuarine, intertidal, forested wetland dominated by black mangrove and intermittently inundated at high tide. Following the removal action, the site remained as a wetland habitat, but the lowered site topography resulted in a predominantly shallow (approximately 5 inches to 3 feet deep) open water lagoon, with deeper portions permanently inundated and supportive of a variety of aquatic fish and invertebrates. Aquatic organisms include anchovies, gobies, puffers, mojarras, mullet, needlefish, snook, blue crabs, hermit crabs, fiddler crab, grass shrimp, and upside-down jellyfish. Extensive shallow areas occur surrounding the SWMU 6 lagoon, especially on the east side, where red and black mangroves are becoming re-established and sediment is exposed at low tide. Various wildlife have been observed foraging along the exposed sediment and shallow water areas including great egret, great blue heron, black-bellied plover, semipalmated plover, ruddy turnstone, and greater yellowlegs. A chain-link fence with signs posted to deter trespassers exists along the southern lagoon boundary, adjacent to Route 200. There</u>

is no boat access to the site; the water connection on the north and west sides of the lagoon is blocked by a thick stand of red mangrove. There is public access (e.g., fishing, kayaking) to the nearby waters of Laguna Kiani via a vehicle/pedestrian bridge and small earthen boat ramp adjacent to the southwest corner of SWMU 6. The new environmental setting at SWMU 6 resulted in changed exposure pathways to human and ecological receptors, relative to pre-removal conditions."

The first sentence in the fourth paragraphs of the Executive Summary (p. ES-1) and Introduction (p. 1-1) have been updated as underlined below:

"The site was originally an estuarine, intertidal, forested wetland dominated by black mangrove, but the 2009 interim removal action altered the site to a shallow marine lagoon environment, approximately 0.6 acre and 5 inches to 3 feet deep (Shaw, 2010; CH2M HILL, 2010a)."

The second sentence in the first paragraph of Section 4.2 Ecological Setting (p. 4-1), and the fifth sentence of the first paragraph of Appendix F, Section 1.2.1 Ecological Setting (p. F-3) have been updated as underlined below:

"Excavation activities resulted in the ecological setting changing from an estuarine, intertidal, forested wetland dominated by black mangrove to a shallow, open water lagoon (SWMU 6 lagoon) that is hydraulically connected to, and tidally influenced by, the adjacent Laguna Kiani complex (Laguna Kiani and Laguna El Pobre)."

Section 5.1, Applicable or Relevant and Appropriate Regulations. The 1997 Refuge Improvement Act should be included as an ARAR. This act states that "the mission of the refuge system is to administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States, for the benefit of present and future generations of Americans." The proposed alternatives presented in the document and ultimately selected should be consistent with the mission of the National Wildlife System.

Navy Response:

The 1997 Refuge Improvement Act (16 USC 668dd) contains administrative requirements for the FWS as well as responsibilities and considerations regarding administrative reviews of actions taken on wildlife refuges and a requirement that regulations be issued. There are no substantive requirements included that require a specific action by the Navy. Further, in general, where regulations have been promulgated under the authority of a statute it is inappropriate to cite the statue as an ARAR rather than the regulations. Therefore, this statute is not an ARAR; however, designation as an ARAR is not required to assure that future land use is considered during remedy development and selection. The National Contingency Plan (NCP) requires that future land use be considered during the Baseline Risk Assessment as well as during remedy development and selection in the FS.

Section 7, Detailed Analysis of Remedial Alternatives. The Fish and Wildlife Service (FWS) suggest that the cost for fencing and signage may be underestimated. The high saline environment will likely result in higher maintenance costs over the projected 30-year project life.

Navy Response:

The cost estimate of fencing and signage was based on past fence installation unit rate at SWMU 6 in 2011. The fence and sign cost is only small portion of the entire remediation cost, and cost variation will not affect the FS evaluation.

Section 7.2.3, Criteria Assessment of Alternative 3. This alternate envisions dewatering the lagoon to facilitate excavation of contaminated sediment. Given the location of the lagoon in the landscape and the proximity to Kiani Lagoon, it may not be feasible to dewater the lagoon without considerable effort and the movement of large

volumes of water. The FWS suggests that should excavation be selected, that it be done in the current inundated state.

Navy Response:

As noted in Section 5.6.1, dredging is not considered an applicable technology. Dredged sediment requires proper handling (upland dewatering and pretreatment containment cell) prior to disposal. This technology is not retained for further evaluation because no upland treatment/disposal facilities are available, dredging equipment is not readily available, and due to the relatively high cost.

Also, as noted in Section 7.2.1, there is uncertainty associated with the technical ability to dewater the lagoon and confirm the required contaminated sediment has been removed. If SWMU 6 lagoon cannot be dewatered to allow "dry" excavation, mechanical dredging using excavator from the bank may be possible, but was not considered as a feasible option (i.e., dredging was not retained during the initial technology screening step of Section 5)."

Section 7.2.3, Criteria Assessment of Alternative 6. This alternate will result in the placement of fill in the inundated lagoon. As microtopography and soil moisture plays an important role in wetland restoration, the final grade should factor in the habitat requirements of the species selected for planting. The FWS offers our expertise to the Navy in this area should this alternative be selected.

Navy Response:

For any alternative selected, the Navy would interact with FWS to ensure satisfactory wetland restoration.